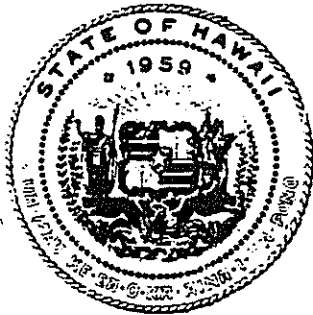


FINAL

KAPOLEI VILLAGE

ENVIRONMENTAL IMPACT STATEMENT



**STATE OF HAWAII
HOUSING FINANCE AND
DEVELOPMENT CORPORATION**

February 1988

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OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Volume 5

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REGISTER OF CHAPTER 343, HRS DOCUMENTS

All Chapter 343, HRS documents submitted for publication in the OEQC Bulletin must be addressed to the Office of Environmental Quality Control, 465 South King Street, Room 104, Honolulu, Hawaii 96813. Documents addressed otherwise will not be considered for publication.

EIS PREPARATION NOTICES

The following proposed actions have been determined to require an environmental impact statement. Anyone can be consulted in the preparation of the EIS by writing to the listed contacts. 30 days are allowed for requests to be a consulted party.

WEST HAWAII SANITARY LANDFILL, NORTH KONA, HAWAII, County of Hawaii, Dept. of Public Works

Previously published April 23, 1988.

Contact: Colette Sakoda, Senior Planner
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Deadline: May 23, 1988

KUIULA PLANNED COMMUNITY, KUKUIULA, OAI. Alexander & Baldwin

Post-It™ brand fax transmittal memo 7671		# of pages ▶ 2
To Michelle	From Jeyan	
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KULA WATER SYSTEM IMPROVEMENTS, KULA, MAUI, Dept. of Land & Natural Resources, Division of Water and Land Development

Previously published April 23, 1988.

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Honolulu, HI 96809

Deadline: May 23, 1988

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ENVIRONMENTAL IMPACT STATEMENT

FOR

KAPOLEI VILLAGE

Ewa, Oahu, Hawaii

This document is prepared pursuant to
Chapter 343, Hawaii Revised Statutes

PROPOSING AGENCY:

STATE OF HAWAII
HOUSING FINANCE AND DEVELOPMENT CORPORATION
1002 N. School Street
Honolulu, Hawaii 97817

RESPONSIBLE OFFICIAL:



JOSEPH K. CONANT, Executive Director



Date

PREFACE

This document is an environmental impact statement describing findings and conclusions for the proposed Kapolei Village residential community and the surrounding environment, located in the Ewa Plain of Oahu. The document is divided into sections describing the master plan, the affected environment, and alternatives considered during the planning stages of the master plan and impacts that may result from the proposed development. Additionally, separate studies of noise, traffic, flora and fauna, air quality, and archaeology, conducted by members of the project team, are provided as appendices.

Consulted agencies and organizations were requested to submit their comments, corrections, and/or clarifications to the Housing Finance and Development Corporation prior to the issuance of the final environmental impact statement.

It should be noted that effective July 1, 1987, the development financing and residential leasehold functions of the Hawaii Housing Authority (HHA) were transferred to the newly created Housing Finance and Development Corporation (HFDC). Thus, any reference to the HHA within the Environmental Impact Statement now refers to the HFDC.

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COMMENTS & RESPONSES RECEIVED DURING THE EIS PREPARATION

REFERENCES

APPENDICES

- A - Noise Study: Darby & Associates, Acoustical Consultants
- B - Traffic Study: Parsons, Brinckerhoff, Quade and Douglas, Inc.
- C - Biological Study: Char & Associates, Botanical/Environmental
Consultants
- D - Archaeology Study: Paul H. Rosendahl, Ph.D., Inc., Consulting
Archaeologist
- E - An Affordable Housing Development Concept, State of Hawaii,
Hawaii Housing Authority, March 20, 1986
- F - Agricultural Impacts: Decision Analysts Hawaii
- G - Air Quality Impact Report, Kapolei Village, J.W. Morrow, Environmental
Management Consultant, December 7, 1987

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SECTION 1
INTRODUCTION AND SUMMARY

1.1 INTRODUCTION

The Housing Finance and Development Corporation (HFDC) in cooperation with the City and County of Honolulu, Department of Housing and Community Development (DHCD), is proposing to develop an innovative, master planned residential community along with a full range of community support facilities including: recreational opportunities; commercial centers; day care facilities; public schools; and a park and ride facility.

Residential units within the proposed project are designed to provide a mix of housing types suitable for different income levels. These housing types include market units (maximum 40 percent of the total residential units) to be sold at market prices and affordable units (minimum 60 percent of the total residential units). Affordable units are to include elderly housing, gap-group housing, and assisted housing (lower income and very low income).

The Ewa area is designated as the future site of the Secondary Urban Center (SUC). The area was designated as the SUC in 1977 by the City and County of Honolulu to attract future population growth and employment opportunities and to relieve urban pressures within the Honolulu area, designated as the Primary Urban Center (PUC).

The Ewa Development Plan area (Census Tracts 83-86.02) was amended in 1986 in accordance with a land use plan prepared by the Estate of James Campbell for establishment of the SUC. Elements of the plan include an urban core of the SUC, known as Kapolei Town Center, and surrounding residential communities. The goal of the plan is to develop a self-contained community with a full range of support facilities and services, including a mix of housing unit types, commercial/retail centers, businesses and community support facilities. It is envisioned that development of a self-contained community will result in a reduction of commuter traffic to and from the PUC and consequently a reduction in requirements for transportation improvements.

1.2 INTENDED USES OF THIS DOCUMENT

This environmental impact statement is prepared in accordance with Chapter 343, Hawaii Revised Statutes and the rules and regulations of the Office of Environment Quality Control. It has been determined that an environmental impact statement is required pursuant to Chapter 200 of Title 11, Administration Rules, Subchapter 5(b).

The purpose of the environmental impact statement is to provide information to public officials and members of the community on the nature of the subject action; to assess existing environmental conditions of the property and surrounding areas; to evaluate potential impacts that may result from development of the project and to propose mitigating measures for those impacts; and to consider alternatives to the proposed action.

The environmental impact statement and the master plan shall be used as basic documents to justify proposed State land use redesignations and amendments to the County's development plan.

1.3 DEVELOPMENT SUMMARY

Applicant: Housing Finance and Development Corporation

Property Owner: Estate of James Campbell

Property Location: Approximately 22 miles west of the primary urban center of Honolulu, near the center of the Ewa Plain, north of the Naval Air Station, Barbers Point (NAS BARPT), south of the Makakilo residential community and directly east of the proposed Kapolei Town Center.

Tax Map Key: Zone 9, Section 1, Plat 16 and encompassing all of Parcel 23 and a portion of Parcel 25.

Area: 830 acres.

State Land
Use District:

Agricultural

City and County
Development Plan
Designation:

Agriculture, Commercial, Public Facility

Existing Uses:

Agricultural

Proposed Uses:

Residential, Commercial, Public Facilities, Parks

Proposed Action:

The applicant proposes to develop 830 acres of land in the Ewa Plain area, Leeward Oahu. Development of the master planned community will offer a mix of residential housing, commercial/retail areas, community facilities, and recreation facilities including an 18-hole golf course. The proposed project is designed to offer a mix of affordable housing (60 percent) and market housing (40 percent).

EIS Accepting
Authority:

Governor, State of Hawaii

1.4 DEVELOPMENT CONCEPT

The overall development concept for Kapolei Village provides for a planned residential community with a full range of community support facilities. Based on the report by the Hawaii Housing Authority: An Affordable Housing Development Concept, March 20, 1986 (Appendix E), the development concept emphasizes residential development with a large percentage of affordable units for elderly, assisted and gap-group families. The development concept is designed to provide a 60/40 percent balance between affordable and market units with affordable housing priced to accommodate low to moderate income families and market units to be available at market prices.

Under the development concept, the State will act as the lead in the development of the proposed project and assume all risks associated with

land acquisition, master planning and obtaining necessary land use and zoning amendments. Additionally, the State will work with the City and County of Honolulu and private sector in the actual development of the proposed project.

The proposed Kapolei Village project is designed to help alleviate Oahu's severe affordable housing shortage. As a means to achieve this goal, the HFDC is proposing to acquire fee title to approximately 830 acres of land from the Estate of James Campbell to master plan and develop the residential community. The proposed project will coincide with goals of the City and County's General Plan to develop the Secondary Urban Center (SUC) in the Ewa Plains area.

1.5 SUMMARY OF PROBABLE IMPACTS AND MITIGATION MEASURES

1.5.1 Agricultural Impacts

At present, the entire project site is used for sugar cultivation by the Oahu Sugar Company (OSCo). Development of the project site will result in a decrease of approximately 830 acres of available sugarcane lands. The development of Kapolei Village would not adversely affect the economic viability of Oahu Sugar Company, nor would it require layoffs of sugar workers. This assumes the continuation of historic development rates for housing projects - rates which would allow sufficient time to increase yields and thereby partially or completely compensate for the reduced acreage with little or no loss in production. Reductions in employment would occur through retirement and voluntary movement to other jobs. Over the long term, OSCo could accommodate a major reduction in acreage and maintain economies of scale by operating just one mill, rather than two in parallel.

1.5.2 Air Quality

The principal source of short term air quality impacts will be from construction activities. In the longer term, increased vehicular traffic resulting from the development will be a major contributor of air pollutants. Short term impacts from construction activities are proposed to be controlled by enforcement of Department of Health regulations. Long

term automotive impacts will be mitigated by improved road facilities in the vicinity of the project area and reduced travel demand to and from urban Honolulu.

1.5.3 Traffic

Kapolei Village, as well as adjacent proposed developments, are expected to increase vehicular traffic in and around the project site, especially during peak travel periods. Mitigative measures applicable to Kapolei Village include signalization at major intersections and on-site facilities including commercial and recreational facilities and a Park-and-Ride facility located at the northwest portion of the project site. This facility may also serve as a terminus for a feeder bus system, linked to the City's proposed mass transit system.

1.5.4 Socio-Economic Conditions

Kapolei Village will increase population in the area by an estimated 15,000 to 16,500 persons using average persons per household of 3.0 to 3.3. This total represents 17 percent of the area's population per the development plan projected at 91,700 by the year 2000. Local employment opportunities provided by the development include approximately 640 commercial jobs, as well as positions in schools and recreation. Kapolei Village is expected to provide a wide range of housing opportunities, particularly in the affordable range, for varied levels of families incomes. Total housing units are estimated at approximately 4,871 units for the development with at least 60 percent of them being in the affordable category.

1.5.5 Noise

Noise impacts generated from future traffic within the project site are expected to be relatively minor as development occurs. Noise impacts from Naval Air Station, Barbers Point, operations have been taken into consideration in the overall layout of the proposed development. Kapolei Village is designed with reference to the AICUZ study prepared by the U.S. Navy, although subsequent studies reveal different findings regarding sound levels within the project site.

1.5.6 Topography and Soils

Impacts occurring on the physical terrain from development of the project site are expected to be minimal. Because the existing site is relatively flat, relatively little grading will be required. Generally, most of the soil is considered low to moderately expansive. Soils that are moderately expansive could require special procedures for house foundation design, such as deep footings, subgrade saturation or capping with non-expansive soils.

1.5.7 Flora and Fauna

The proposed project is not expected to have a significant impact on flora as the site consists primarily of cultivated lands. There are no rare, threatened or endangered vertebrate animal species known to exist on the project site.

1.5.8 Water

The total average potable water demand for the development is estimated at 2.8 mgd. Proposed on-site water improvements include water lines along internal roadways. Off-site water improvements include a second 30-inch main along Farrington Highway and additional storage reservoirs, located north of the H-1 Freeway. With approval and implementation of these proposed facilities, no adverse impacts are expected locally or regionally. The water system is to be approved by the Board of Water Supply. An adequate supply of water will be available for the proposed project.

1.5.9 Sewer

The average daily sewer flow generated by the development is projected at 2.1 mgd. Sewage generated by the project is to be conveyed via the West Beach interceptor sewer to the Honouliuli Wastewater Treatment Plant (WWTP) for treatment and disposal. Proposed off-site improvements include upgrading a portion of the West Beach interceptor sewer to accommodate flows from Kapolei Village. Additionally, the Honouliuli Wastewater Treatment Plant (WWTP) is scheduled for expansion to be completed in 1993. After expansion, the WWTP is expected to accommodate all new development in the Ewa area.

1.5.10 Drainage

The only improvement to the off-site drainage system is upgrading the drainage swale north of Farrington Highway to prevent overflowing onto Farrington Highway during a 100-year storm. On-site drainage system improvements consist of underground box culverts and open channels directing runoff to a detention basin (golf course). The detention basin will serve to attenuate the downstream peak flow rates by providing temporary storage of the runoff. The runoff will be released at a controlled rate after the storm subsides into the coral pit inside NAS BARPT at a peak flow of 2,430 cfs.

These improvements are anticipated to have positive impacts on NAS BARPT, since runoff presently sheetflows into the base and causes localized flooding.

1.5.11 Solid Waste

Currently, solid waste is disposed of at the Palailai Landfill and the Waipahu Incinerator. The Palailai Landfill is scheduled to close within the next few years and is not expected to provide a refuse disposal site for the proposed project. However, a new landfill site at Waimanalo Gulch is currently being implemented and a Garbage-to-Energy H-POWER facility, located in the James Campbell Industrial Park, is scheduled to become operational in late 1990. These facilities are expected to accommodate the proposed project.

1.5.12 Power and Communications

No adverse impacts resulting from off-site and on-site improvements are anticipated. Proposed off-site power and communications requirements will be provided as needed.

1.6 UNRESOLVED ISSUES

Unresolved issues regarding development of the proposed Kapolei Village include: the purchase of the project site from James Campbell Estate by the Housing Finance and Development Corporation; requirement of a Land Use

District Boundary Amendment, changing the current land use designation from agriculture to urban; and the operations and management of the golf course, either by a government agency or by a private leaseholder.

1.7 ALTERNATIVES CONSIDERED

Alternatives to the proposed development include a "No Action" alternative resulting in preservation of existing conditions of the proposed project site. The undeveloped site would most likely continue to be used for sugarcane cultivation for the near future. The "No Action" alternative would result in the absence of an innovative residential community offering a mix of housing opportunities to suit lower income families, as well as middle to upper middle income families.

In preparing the recommended master plan for Kapolei Village, five alternative concept plans were created based on a development program established by the Housing Finance and Development Corporation. Initial criteria for the concept plans included provision of approximately 5,000 housing units (60 percent affordable and 40 percent market) within each alternative plan. The plans were then created with varied design elements, infrastructure systems, and recreational facilities, while maintaining the initial number and type of housing units. Brief descriptions of the alternative plans are as follows:

A. Alternative 1

Alternative 1 was designed as a conventional residential subdivision with a simple loop road winding through the project site intersecting the proposed Ewa Parkway. No major community image or focal point was provided within this plan.

B. Alternative 2

Alternative 2 incorporated the use of small neighborhood parks surrounded by high density housing units. The plan also provided

for open drainage channels for on-site retention of storm water and major public facilities located along Farrington Highway, on the northern border of the project site.

C. Alternative 3

Alternative 3 contained a civic facilities "backbone" concept with a surrounding loop road oriented from Barbers Point Access Road. Interior circulation would be provided via walkways and bikepaths. The plan also provided for four recreation centers located within strategic areas of the project site.

D. Alternative 4

Alternative 4 was designed with a central lake located in the middle of the project site, south of the intersection of the internal loop road and the entrance road from Farrington Highway. This plan did not allow for a major east-west roadway running through the project site as did the other concept plans.

E. Alternative 5

Alternative 5 added an 18-hole golf course to the project providing identity, as well as creating premium residential lots with golf course frontage. The golf course design also allowed for integration of drainage channels.

Elements of these alternative plans were evaluated and the best features of each plan were combined into a preferred alternative plan. This preferred alternative was then refined to become the recommended "master site plan" for the proposed project site.

1.8 NECESSARY PERMITS AND APPROVALS

A. State of Hawaii

Land Use Commission

Land Use District Boundary
Amendment

B. City and County of Honolulu

Dept. of General Planning

Ewa Development Plan Amendments

Dept. of Land Utilization

Change of Zone Approvals, Subdivision Approvals

Building Department

Building Permits; Grading Permits

Board of Water Supply

Water Master Plan Approval

Dept. of Public Works

Drainage Master Plan Approval

Sewer Master Plan Approval

SECTION 2

PROJECT DESCRIPTION

SECTION 2
PROJECT DESCRIPTION

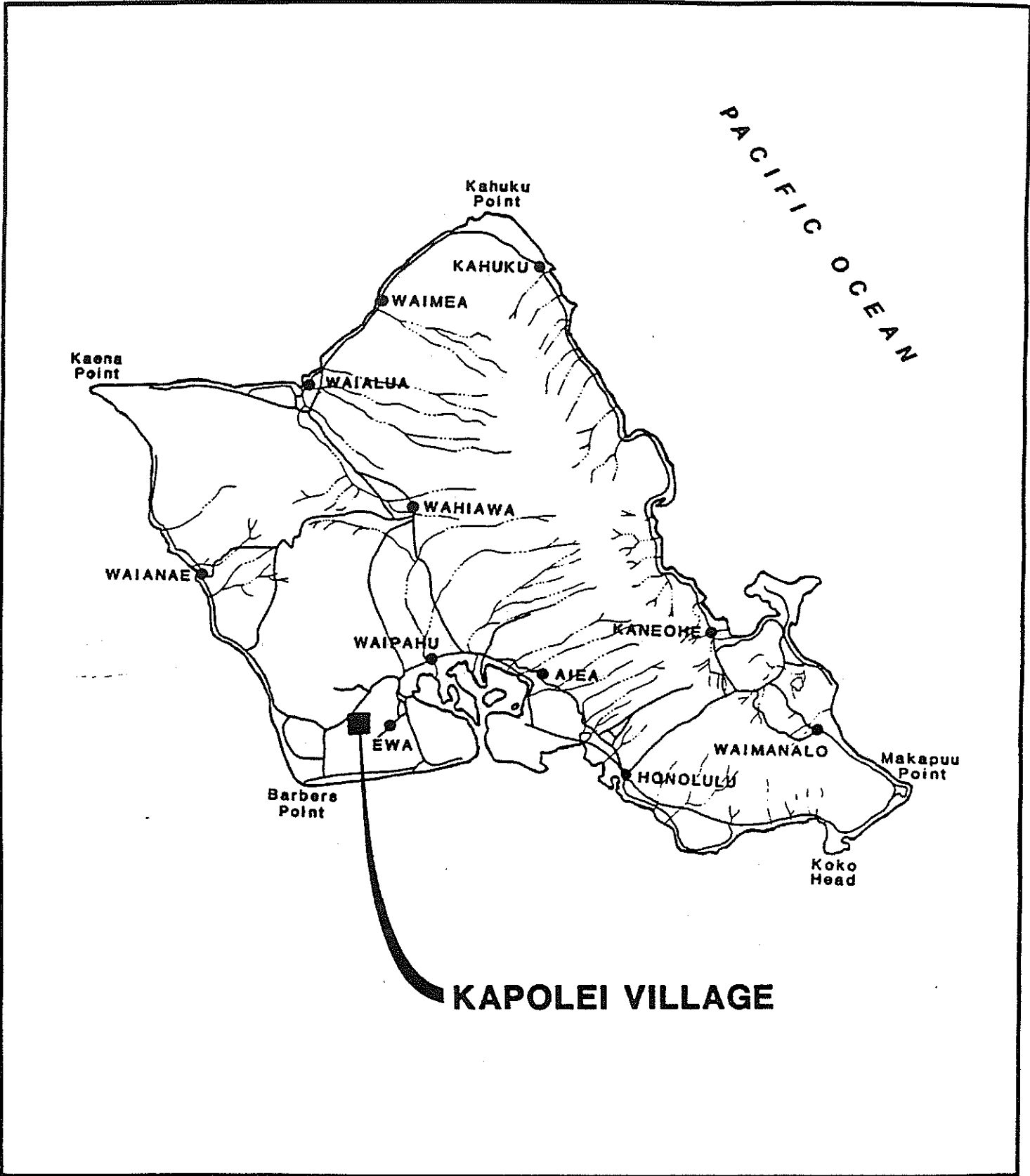
2.1 LOCATION

The proposed Kapolei Village is located on the southwest side of the Island of Oahu, approximately 22 miles west of the primary urban center of Honolulu (Figure 2-1). The site is located near the center of the Ewa Plain, north of Naval Air Station, Barbers Point (NAS BARPT), south of the Makakilo residential community and directly east of the proposed Kapolei Town Center. The Kapolei Shopping Center is now being developed adjacent to the northwest corner of the site. Further to the west lie the Campbell Industrial Park, Deep Draft Harbor, Ko'Olina resort/residential community, and the existing community of Honokai Hale. Major roadways providing access to the site include the H-1 Freeway, Farrington Highway, and Barbers Point Access Road.

The 830-acre project site is owned by the Estate of James Campbell and is leased to the Oahu Sugar Company for sugarcane cultivation. For taxation purposes, the project site is identified as lying within Zone 9, Section 1, Plat 16 and encompassing all of Parcel 23 and a portion of Parcel 25. Campbell Estate owns all of the land surrounding the project site with the exception of roadway and railway rights-of-way, including Barbers Point Access Road and Makakilo Interchange, owned by the State of Hawaii; Farrington Highway and Fort Barrette Park (Puu Kapolei) owned by the City and County of Honolulu; and NAS BARPT owned by the Federal Government.

2.2 DEVELOPMENT CONCEPT

The overall development concept for the proposed Kapolei Village has as its basis the development of a planned residential community to include a large percentage of affordable residential units for elderly, assisted and gap-group families (Hawaii Housing Authority: An Affordable Housing Development Concept, March 20, 1986). The following are the development concept objectives:



Kapolei Village
LOCATION MAP
 Ewa, Oahu, Hawaii

Figure:
 2-1


 0 ——— 6 miles

A. Site Selection

Site selection criteria for the proposed project include obtaining reasonably priced land for the project site; location near existing or planned infrastructure; flat topography; and proximity to existing employment centers and communities or areas of future growth.

B. Land Use

Land use within the project site is to be distributed whereby necessary infrastructure and facilities are to be developed in support of planned residential units.

C. Housing Mix

Residential units shall entertain a 60/40 mix between affordable units and market units, respectively. The affordable units would be sold and/or rented at affordable price ranges to be determined by the HFDC. Affordable units are targeted at groups including the elderly, assisted (very low income and lower income) and gap-group families. Definitions of these affordable groups are as follows:

(1) Elderly

Elderly families are defined as those families whose head of household or spouse (or sole member) is 62 years old or older, disabled or handicapped.

(2) Assisted

Very low income families are defined as those families with earnings not more than 50 percent of the area's median income as defined by the Department of Housing and Urban Development (HUD). Lower income families fall between 50 and 80 percent of the HUD area median income.

(3) Gap Group

Gap-group families are defined as those families with earnings between 80 and 120 percent of the HUD area median income. At current interest rates, a gap group family of four, Island of Oahu, would be able to purchase a home in the price range of \$79,500 to \$125,500. These families are considered to have incomes too high to qualify for rental subsidy programs, yet too low for conventional financing.

D. Markets Units

Market units would be offered for sale at appraised values with the excess revenues derived from the sales used to reduce the costs associated with affordable units. Additionally, market rental units will be available.

E. Commercial Property

Commercial land, developed in support of residential units, would be owned in fee simple by the HFDC and leased to potential developers. Revenues gained from the leases would support various functions of the HFDC.

The development concept acts as an "aggressive vehicle for producing a consistent level of affordable housing units." Using tools available under Act 337, Session Laws of Hawaii, many variables which contribute to high costs associated with housing development can be controlled with the savings used to reduce housing costs.

Under the concept, the State will act as the lead in the development of the proposed project and assume all risks associated with acquiring, master planning and obtaining necessary land use and zoning amendments. Additionally, government will work with the private sector in the master planning and development process of the proposed project.

2.3 THE MASTER PLAN

The recommended master plan encompasses an 830-acre site and provides for approximately 5,000 residential housing units. A land use summary table is presented in Table 2-1 accompanied by a discussion of each of the principal land use components. In addition to siting criteria discussed above, residential uses have been sited to provide for a balanced mix of housing types throughout the project area (Figure 2-2).

The recommended master plan utilizes loop roads in conjunction with the proposed Ewa Parkway to provide a simple and direct parkway system of collector roads. In addition to the internal loop roads, a secondary connector roadway is located midway down West Loop to provide additional through access to Barbers Point Access Road. Village Parkway and the internal loop roads also provide for pedestrian and bicycle circulation within the project site.

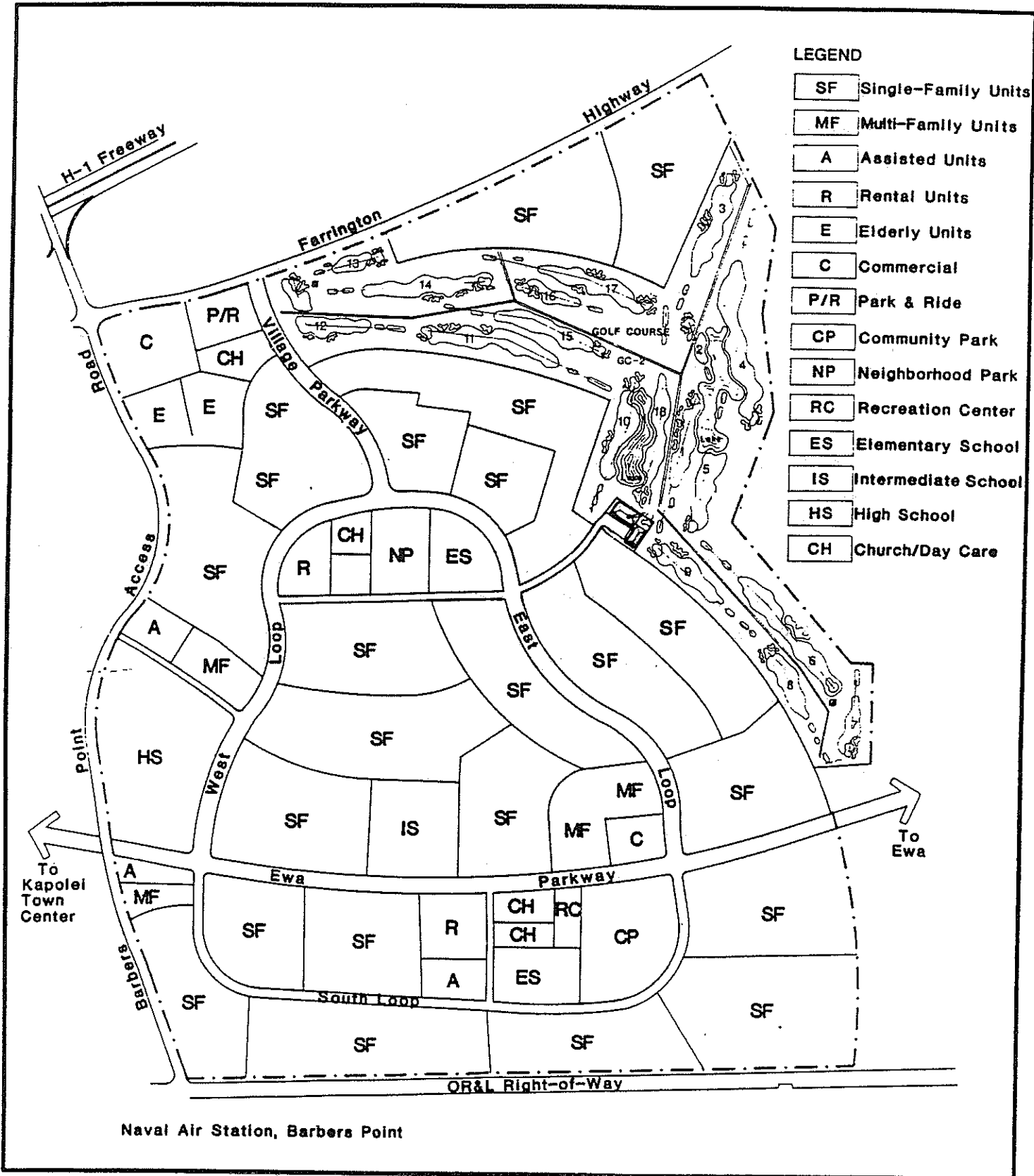
The project site is subdivided into small residential neighborhoods. Within these neighborhoods, the local street system will be designed to discourage high speeds and through traffic. However, many of the interior cul-de-sacs terminate near the loop roads to allow pedestrian and bicycle access.

The primary entry to the project is from Farrington Highway via Village Parkway. Entering the site from this location provides visual overviews of both the project site and Pearl Harbor in the distance. An entry identification feature at this location will signal the arrival into a modern, contemporary residential community. Located west of the entry, at the intersection of Barbers Point Access Road and Farrington Highway, is a commercial center. Adjacent to the commercial center, at the entrance to the property, is a landscaped Park-and-Ride facility providing convenient bus and auto access to Farrington Highway, Barbers Point Access Road on the H-1 Freeway.

TABLE 2-1

RECOMMENDED PLAN LAND USE SUMMARY

	<u>Acreeage</u>	<u>Percent of Site</u>	<u>Average Density</u>	<u>Units</u>	<u>Mix</u>
RESIDENTIAL	501.8	60%	9.7	4,871	100%
Single Family (For Sale)	449.0		8.3	3,722	76
Multi-Family (For Sale)	18.9		15.0	283	6
Elderly Rental	12.5		35.0	438	9
Market Rental	12.8		20.0	255	5
Assisted Rental	8.6		20.0	173	4
RECREATION, PARKS & OPEN SPACE	179	22%			
Golf Course	144				
Golf Clubhouse	3				
Recreation Centers (2)	5				
Neighborhood Park (1)	0.6				
Community Park (1)	14				
Entry Feature/Buffer	0.66				
CIVIC	14	2%			
Church & Day Care (4)	9				
Park & Ride	5				
SCHOOLS	52	6%			
Elementary (2)	12				
Intermediate (1)	15				
High (1)	25				
COMMERCIAL	11	1%			
Neighborhood	3				
Other Commercial	8				
ROADWAYS	63	8%			
Major Internal	45				
Ewa Parkway	18				
DRAINAGE	<u>10</u>	<u>1%</u>			
TOTAL ACREAGE	830	100%			



Kapolei Village
RECOMMENDED MASTER PLAN
 Ewa, Oahu, Hawaii



Figure: 2-2

Throughout the proposed project, a mix of housing types is provided. Residential types are well integrated, although certain overriding guidelines have been followed in determining the placement of each housing type. Market units are located along golf course frontages and in areas of views for maximum value. Higher density increments of rental, assisted and elderly housing have been located in proximity to parkways and community and commercial facilities.

Community facilities have been located along the internal loop roads to allow for convenient access. A 6-acre neighborhood park is located at the southern terminus of Village Parkway to serve as a green background when entering the project site, as well as for location convenience. A community park is located in the southern portion of the project site at the intersection of Ewa Parkway and South Loop. The two elementary school sites are dispersed with one in the northern region and one in the southern region of the site, as are two recreation centers. An intermediate school and a high school are located along Ewa Parkway. Four church/day care center sites have been dispersed throughout the site including one located adjacent to the Park-and-Ride facility near the primary entrance.

2.3.1 Residential

The most extensive land use of the proposed project is residential, occupying approximately 61 percent of the project area. As previously discussed, residential units are planned for a 60/40 percentage mix between affordable and market housing, respectively. Affordable units are targeted at groups including the elderly, assisted (very low income and lower income) and gap-group families while market units will be sold at market prices. Discussions of the various housing types are presented below.

A. Single Family (For Sale) Units

Single family units occupy approximately 76 percent of the designated residential land. The recommended master plan accommodates 3,722 single family housing units on 449.0 acres of land dispersed throughout the development. Many of the market units are planned along fairway frontages to maximize value.

B. Multi-Family (For Sale) Units

Multi-family units comprise approximately 6 percent of the residential land. The master plan accommodates 283 multi-family units on 18.9 acres of land situated on four sites. Multi-family units are located adjacent to major public facilities such as schools, shopping areas, recreation centers and churches and day care facilities.

C. Assisted Rental, Market Rental and Elderly Rental Housing

A total of three sites have been located within the development for assisted rental housing which will include approximately 173 housing units. Two sites for market rental housing have been designated, one site includes 5.4 acres and another includes 7.4 acres. Together these sites will provide for 255 housing units. Elderly rental housing will be provided on two sites of approximately 6 acres each with a total of 438 units.

All rental units are strategically located adjacent to major public facilities and are readily accessible to public transportation.

2.3.2 Recreation, Parks and Open Space

Recreation, parks and open space amenities have been strategically planned within the development to adequately service community demands. These land uses and a discussion of the entry feature and landscape buffers follows below.

A. Golf Course

An 18-hole golf course has been provided on approximately 144-acres of land in the northeastern quadrant of the project site. The golf course is fully contained within the U.S. Navy AICUZ designated APZ II Zone and the high noise areas (65 Ldn and above). A principal rationale for the golf course is its ability to function as a drainage path and act as a retention basin for stormwater drainage flows generated from the project site. To

perform this function, the entire golf course area will be excavated two to four feet below existing grades. Soils excavated from the golf course will be used throughout the project site to create landscaped berms and to provide fill for roadways and construction activities. The existing 24-inch Navy water line, extending from Farrington Highway through the golf course and the southern residential areas to NAS BARPT, will have to be rerouted before the golf course excavation can begin.

A three-acre site for the golf clubhouse has been reserved with access off of East Loop. Golf course fairways have been designed with the safety of the abutting housing in mind. Minimum distances from fairway centerlines to property lines have been maintained with additional distances provided in many cases. All fairways have been aligned to minimize the potential for misdirected golf balls entering adjacent residential areas. The golf course also serves as a buffer between residential areas and agricultural activities occurring east of the project site.

B. Parks and Recreation

One 6-acre neighborhood park, one 14-acre community park, and two 2-acre recreation centers have been planned for the project. The neighborhood park is located adjacent to the elementary school at the intersection of Village Parkway and South Loop. The community park is located at a very visible location at the eastern intersection of Ewa Parkway and South Loop. A district park serving the regional needs of Ewa residents will be located within the proposed Kapolei Town Center development, immediately west of Kapolei Village.

Recreation centers have been located adjacent to parks and other public areas: one recreation center is located adjacent to the neighborhood park and church site at the southern terminus of

Village Parkway, while the second recreation center is located adjacent to the community park and elementary school site, south of Ewa Parkway.

C. Entry Feature/Buffer

A small 0.6-acre entry feature at the Farrington Highway, Village Parkway intersection will signal the arrival to Kapolei Village. Additionally, perimeter landscaping is planned along the Barbers Point Access Road and Farrington Highway to create aesthetically pleasing project boundaries and to provide buffers from adjacent roadway activities.

2.3.3 Civic

A. Churches/Day Care Centers

A total of four churches and church/day care center sites have been designated throughout the project site on lots ranging from 1.8 to 3 acres in size. The sites have been selected for their visibility and convenience to residential neighborhoods. A combination church and day care center is located adjacent to the Park-and-Ride facility near the intersection of Village Parkway and Farrington Highway.

B. Park-and-Ride Facility

A 5-acre Park-and-Ride site (capacity: c. 600 vehicles) proposed to be developed by the City and County of Honolulu is planned adjacent to the main entry at the Village Parkway/Farrington Highway intersection. The Park-and-Ride facility is sited next to a commercial center and a church/day care facility.

2.3.4 Schools

A full range of public school sites have been designated. Two elementary schools are proposed (approximately 6 acres each), one located near the intersection of East Loop and Village Parkway and the other located within the residential area north of South Loop. A proposed intermediate school

site of 15 acres is located on the north side of Ewa Parkway between East Loop and West Loop. A 25-acre high school site is proposed along Ewa Parkway at the intersections of West Loop and Barbers Point Access Road. This location will be accessible to Makakilo residents as well as residents of Kapolei Town Center and Kapolei Village.

2.3.5 Commercial

Two commercial areas are proposed within the project. A 8.1-acre site is proposed at the corner of Farrington Highway and Barbers Point Access Road and a smaller 3-acre site is located at the intersection of Ewa Parkway and East Loop. The larger site will be reserved for regional scale commercial activities while the smaller site will be developed in later stages of the project for neighborhood commercial activities.

2.4 SUPPORT INFRASTRUCTURE

2.4.1 Water

The total average water demand for Kapolei Village is approximately 2.8 million gallons per day (mgd). The maximum daily demand is 4.2 mgd, and the peak hour demand is 8.4 mgd.

Proposed water improvements include water mains and appurtenances along Village Parkway, East Loop, West Loop, and Ewa Parkway, as well as smaller 8-inch water lines along internal roadways. The proposed water system is planned to be connected to the existing 30-inch transmission line along Farrington Highway. A second parallel 30-inch transmission line along Farrington Highway to be installed by Campbell Estate, will also serve the development. Future water storage will be provided by the proposed Kapolei 228-foot reservoir, to be located north of the H-1 Freeway. Construction of the reservoir will be the responsibility of the developers of Kapolei Village and Campbell Estate. The water reservoir design is to be approved by the Board of Water Supply.

The HFDC is reviewing several options for off-site water sources, one of which is to participate in the Ewa Regional Water Development Corporation.

Under this master plan, water requirements will be shared among participating developments with costs allocated according to total unit numbers. Should HFDC decide not to participate in the water development corporation, HFDC will seek out and develop their own water sources. Consideration is being given to implementing a "dual system": potable water and non-potable water.

2.4.2 Sewer

The average daily sewer flow generated by the development is projected at 2.1 mgd. The peak flow is projected at 6.6 mgd.

Sewage generated by the project is to be conveyed via the West Beach interceptor sewer to the Honouliuli Wastewater Treatment Plant (WWTP) for treatment and disposal. Proposed off-site improvements include upgrading the West Beach interceptor from Barbers Point Access Road to the Honouliuli WWTP to accommodate flows from Kapolei Village.

On-site improvements include sewer lines and appurtenances along Village Parkway, East Loop, West Loop, and Ewa Parkway. The collection system will be a gravity system with ultimate connection to the West Beach interceptor sewer, located southeast of the project site. During the initial period of development, the sewage will be collected and pumped to the Makakilo interceptor located along Barbers Point Access Road via a temporary pump station. In the later phases, the pump station will be replaced with a complete gravity system.

The sewer system will be designed in accordance with the Division of Wastewater Management, City and County of Honolulu, and the Department of Health, State of Hawaii.

2.4.3 Drainage

The only improvement to the off-site drainage system is upgrading the drainage swale north of Farrington Highway to prevent overflowing onto Farrington Highway during a 100-year storm. This has been categorized as off-site because the land is not part of the project site.

The on-site drainage system can be separated into two categories: (1) major facilities and (2) street collection system. Improvements in the first category include the development of major facilities to handle large amounts of runoff generated north of the site and within the project site. These improvements consist of underground box culverts, open channels, and a detention basin (which utilizes the golf course area). Runoff entering the study site will be collected by the improved swales above Farrington Highway and conveyed by underground box culverts to the detention basin. The flows are then routed through the basin. Runoff leaving the study site will be carried by an open channel from the detention basin to an existing coral pit with NAS BARPT.

The detention basin will serve to attenuate the downstream peak flow rates by providing temporary storage of the runoff. The basin is sized to hold a volume of runoff equivalent to the additional amount generated as a result of the project. The detained runoff will be released at a controlled rate after the storm subsides. A small culvert at the exit will be able to pass everyday low flows.

The second category pertains to the on-site street collection system. These improvements consist of drain lines and appurtenances within the road rights-of-way. The collection system will collect and direct runoff to either the detention basin (golf course) or to a major channel or box culvert.

2.4.4 Power and Communications

Proposed off-site power and communication requirements include a telephone switching station to serve the proposed Kapolei Town Center and the project site, and an electrical substation when existing power capacities are exceeded.

Proposed on-site power and communications improvements consist of power and telephone conduits provided along the major roadways. The system also includes streetlights and handholes. Power and telephone systems will be underground within the development.

2.4.5 Circulation

Kapolei Village will provide an effective roadway system to serve residents of the development as well as commuters from surrounding areas. Roadway types within the planned development include local streets, collectors, arterial streets, and parkways. All roadways within the planned development will be dedicated to the City and County of Honolulu.

Major off-site improvements include upgrading the Makakilo interchange of the H-1 Freeway, and widening and signaling sections of Farrington Highway and Barbers Point Access Road.

On-site roadway improvements include: construction of Village Parkway, East Loop and West Loop (120-foot right-of-way, four-lane roadways); two arterial roads (70-foot right-of-way, three-lane roadways); and a range of local and minor street collectors within the residential areas. A major segment of Ewa Parkway (150-foot right-of-way, 6-lane roadway) will also be constructed. Local streets and minor collectors will provide access to residential properties, as well as schools, parks, and churches. Commercial areas will be accessed from arterial streets.

Access into each neighborhood will be provided via minor collectors and all neighborhoods will have either a second point of access or an emergency lane. Collector streets are limited in length and have been laid out to discourage through traffic. Four-foot wide sidewalks will be provided on both sides of roadways and on-street parking will be allowed at most locations. A standard 56-foot right-of-way will be used for collectors. Local streets will use a 44-foot right-of-way, except for dead-end streets where lengths are less than 300 feet where the right-of-way will be 32 feet. Some of the dead-end streets will terminate near arterial streets, allowing pedestrian and bicycle access into neighborhoods.

Neighborhoods will be linked by an arterial street system which includes loop roads (East Loop, West Loop and South Loop), Ewa Parkway, Village Parkway connecting the loop roads to Farrington Highway, and a smaller arterial street (Road A) between West Loop and Barbers Point Access Road.

The parkway and the loop roads north of Ewa Parkway will include planted medians, with no on-street parking allowed. Signalization at major intersections is anticipated.

Running through the project site, the Ewa Parkway corridor will consist of a 150-foot right-of-way. The parkway will be a six-lane boulevard with landscaped medians. Separated bike paths and meandering sidewalks are also included in the conceptual landscape plan for the parkway. The parkway is planned to traverse across the Ewa Plain, linking Pearl Harbor to the Ko'Olina Resort.

Village Parkway, East Loop and West Loop will be constructed within 120-foot rights-of-way. These four-lane divided roadways will include landscaped medians and landscaping along roadsides. The 32-foot pavement areas will include two automobile travel lanes and a bike lane in each travel direction. Additional pavement width at major intersections will be provided for turn movements by reducing median widths and/or roadside area. Because parkways are primarily intended for movement of traffic, median openings will only be provided at street intersections. A limited number of driveways will be allowed with ingress/egress movements limited to right turn movements only.

South Loop and Road A will be within 70-foot right-of-ways. On these streets, median left turn lanes will be provided to facilitate driveway access. These streets will have broader sidewalks to serve the expected higher pedestrian activity.

The loop roads and Village Parkway will be used for public bus routing within the project site. Over 95 percent of the residential units would be within the City and County 2,000-foot guideline for "adequate" bus service without having to route buses into neighborhoods. Bus routing could include shuttle buses circulating within Kapolei Village or between the Village and the Town Center connecting to express buses and other routes at the Park-and-Ride site.

2.4.6 Landscaping

The landscape of Kapolei Village is designed to establish a unique "sense of place" and to insure a central theme or character throughout the development.

A. Roads and Streets

Landscape development within ROW's of project roads, streets and adjacent roadways outside of the project vary in scale and level of development. Landscaping will occur on the project side of each of the peripheral roadways. Utility corridors, bicycle/pedestrian sidewalks and planting, including large canopy trees in a formal arrangement, will occur within this area. A wall is proposed for the northern and eastern borders of the project which will form the edge/limit of the landscape improvements as well as providing a sound barrier against vehicle noise. Landscaped medial strips and landscaped shoulder areas (similar to the peripheral roadways) will occur along the major 120-foot right-of-way project roadways. Project walls are also recommended. Other project roads are planned to conform to existing standards.

B. Pedestrian/Bicycle Circulation

Pedestrian and bicycle circulation systems are provided along all peripheral and internal roadways. A combined pedestrian/bicycle path is proposed for the project side of both Farrington Highway and Barbers Point Access Road. Within the 120-foot right-of-way internal roadways, a bicycle path is designated along the paved roadway. Pedestrian circulation would be accommodated by a separate sidewalk occurring within the landscaped portion of the right-of-way. In order to facilitate pedestrian and bicycle movements, specific points of connection from residential areas to major project roads have been provided.

2.5 PROJECT PHASING AND COSTS

2.5.1 Phasing







The project will be developed in six phases with construction of the first phase beginning in 1988. Construction activities will begin in the northern quadrant of the project working from north to south (Figure 2-3). A general constraint imposed on the project phasing was the request by the Oahu Sugar Company to maintain the Waimanalo agricultural roadway until 1995.

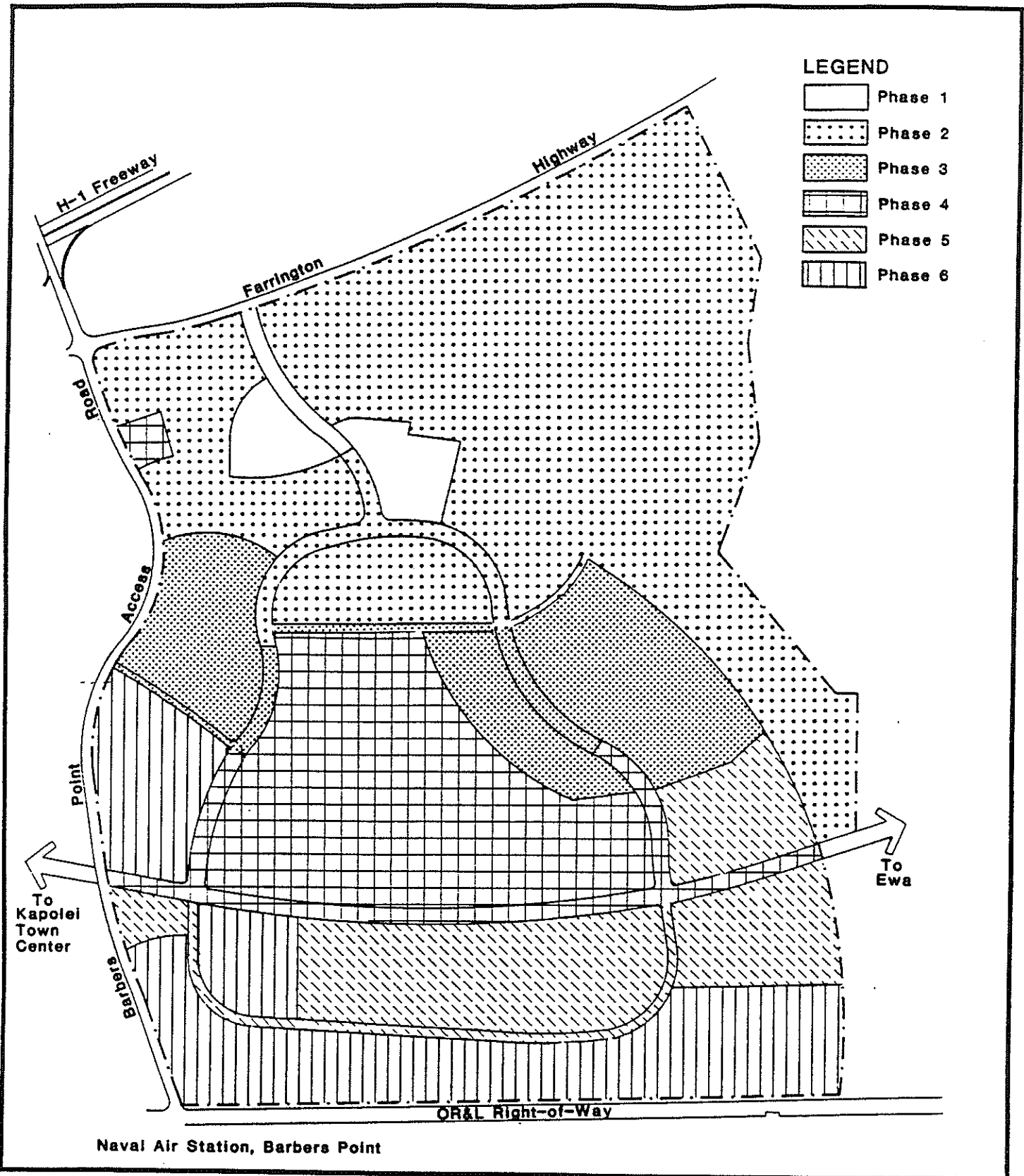
2.5.2 Costs

Infrastructure costs were broken down by utilities and categorized as either off-site or on-site. Costs reflect only construction costs and do not include survey, design, marketing, master planning, land and other non-construction cost items.

The ultimate off-site cost of the entire 830-acre site (including a 10 percent contingency factor) is \$63.3 million. Average on-site costs are estimated between \$19,000 and \$25,000 per lot for an average finished lot cost between \$35,000 and \$40,000.

LEGEND

-  Phase 1
-  Phase 2
-  Phase 3
-  Phase 4
-  Phase 5
-  Phase 6



Kapolei Village
PHASING PLAN
Ewa, Oahu, Hawaii

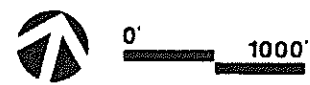


Figure:
2-3

SECTION 3

ALTERNATIVES TO THE PROPOSED ACTION

SECTION 3
ALTERNATIVES TO THE PROPOSED ACTION

3.1 NO ACTION ALTERNATIVE

A "no action" alternative would result in continuation of existing conditions for the Kapolei Village project site. The site would most likely continue to be used for sugarcane cultivation for the near future. However, as surrounding development occurs as part of the Secondary Urban Center, agriculture activities would probably be eliminated.

Advantages of the "no action" alternative are few. These advantages include: no further expenditures of resources required by public and private agencies; continued sugarcane cultivation of the site; and no adverse impacts on the project site generated by development.

The primary disadvantage of this non-project alternative would be the absence of a planned residential community with a unique mix of housing opportunities to suit lower income families, as well as middle to upper middle income families. Additionally, losses resulting from this alternative would include lost housing and employment opportunities, as well as lost tax revenues for City and State governments.

3.2 SITE SELECTION

The initial site selection process conducted by the Hawaii Housing Authority (now the Housing Finance and Development Corporation) involved finding a large enough land area to accommodate a planned residential community. After research revealed no available State land areas suitable for their needs, the Hawaii Housing Authority sought possible project sites from private land owners. The Estate of James Campbell suggested possible sites, all of which are located within the Ewa plains area. Analysis of the sites resulted in selection of the current proposed project site due to the availability of a large land area and the proximity to future development of the proposed Secondary Urban Center.

3.3 CONCEPT PLAN ALTERNATIVES

A total of five alternative concept plan configurations were developed from program criteria specified by the Housing Finance and Development Corporation. Major differences in the alternative plans deal with treatments of drainage, circulation, and recreational facilities. Each plan is discussed in detail below in terms of basic concept/design, land use pattern, and treatment of roads and drainage.

3.3.1 Alternative 1

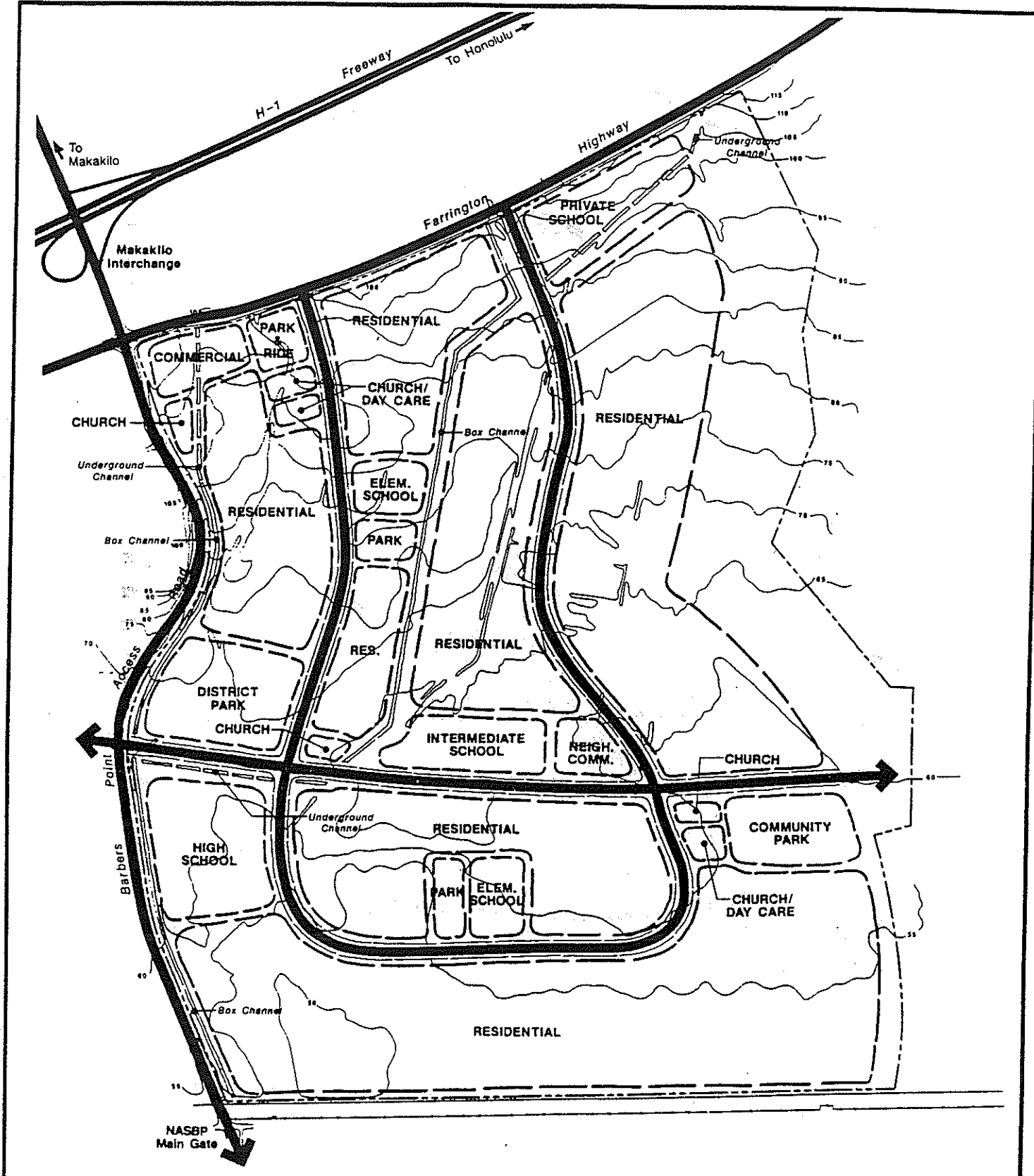
Alternative 1 was prepared as a conventional residential subdivision with a simple loop road winding through the project site, intersecting the proposed Ewa Parkway (Figure 3-1). Major facilities, such as school sites, neighborhood commercial centers and park systems are clustered along major roadway corridors. Drainage throughout the project site is directed underground via box culvert, virtually eliminating constraints of land use. The proposed Ewa Parkway is sited along the Waimanalo Road corridor. No major community image or focal point was provided within this plan.

3.3.2 Alternative 2

The basic organizing concept of Alternative 2 is the use of small neighborhood parks (lokus). High density housing is placed around the lokus to take advantage of open space. Open drainage channels provide bicycle and pedestrian circulation systems and provide for some on-site retention of stormwater. Public facilities, such as a Park-and-Ride facility, a high school site, church sites, an elementary school and a community park are located adjacent to Farrington Highway. Other public facilities are located near the middle and along the southern sections of the project site (Figure 3-2).

3.3.3 Alternative 3

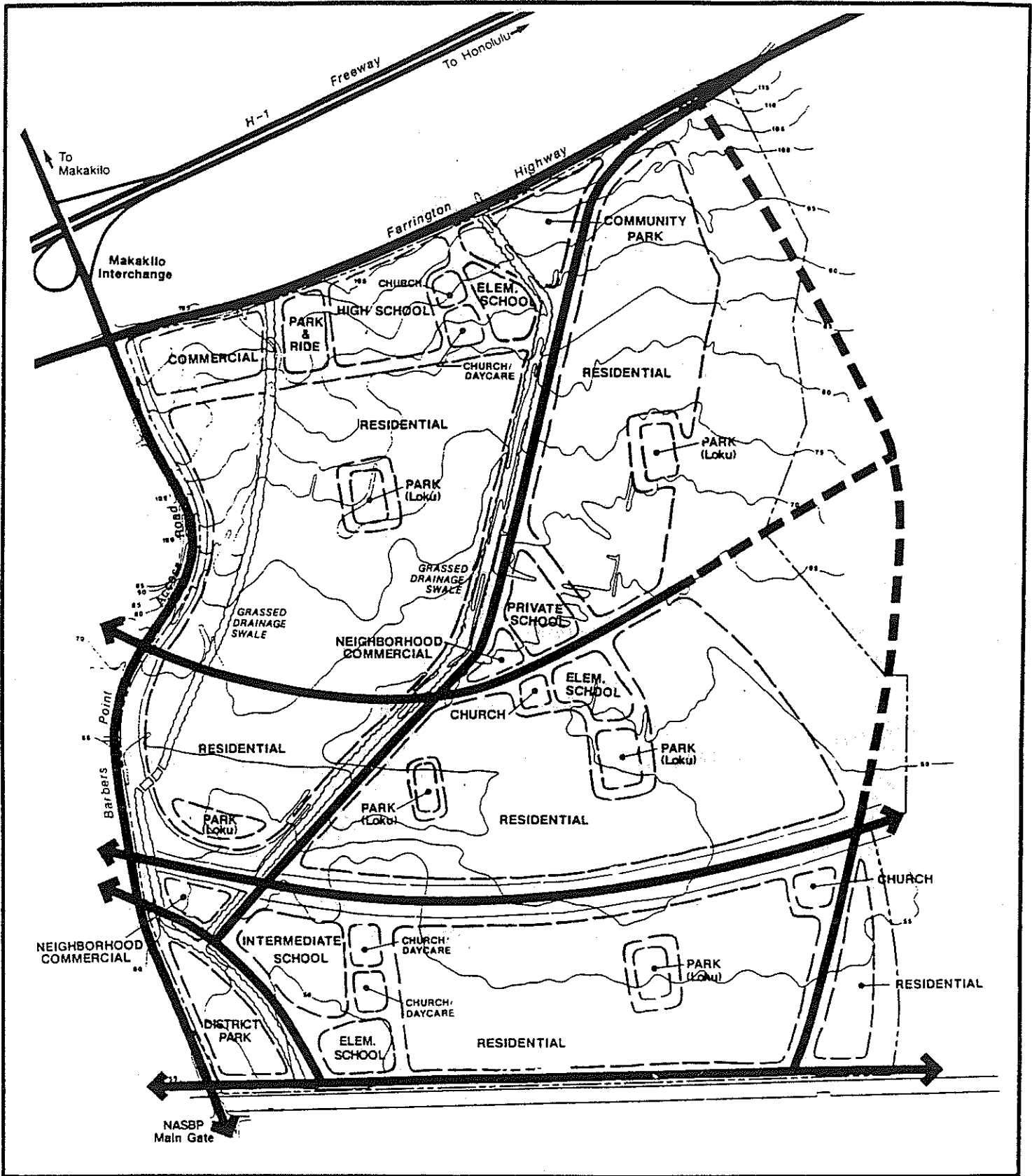
The central concept of Alternative 3 is the creation of a major civic "backbone" created along the realigned drainage swale running north and south on the project site (Figure 3-3). The civic backbone would link most major community uses and activities via bicycle and pedestrian paths. The



Kapolei Village
ALTERNATIVE NO.1
 Ewa, Oahu, Hawaii



Figure: 3-1

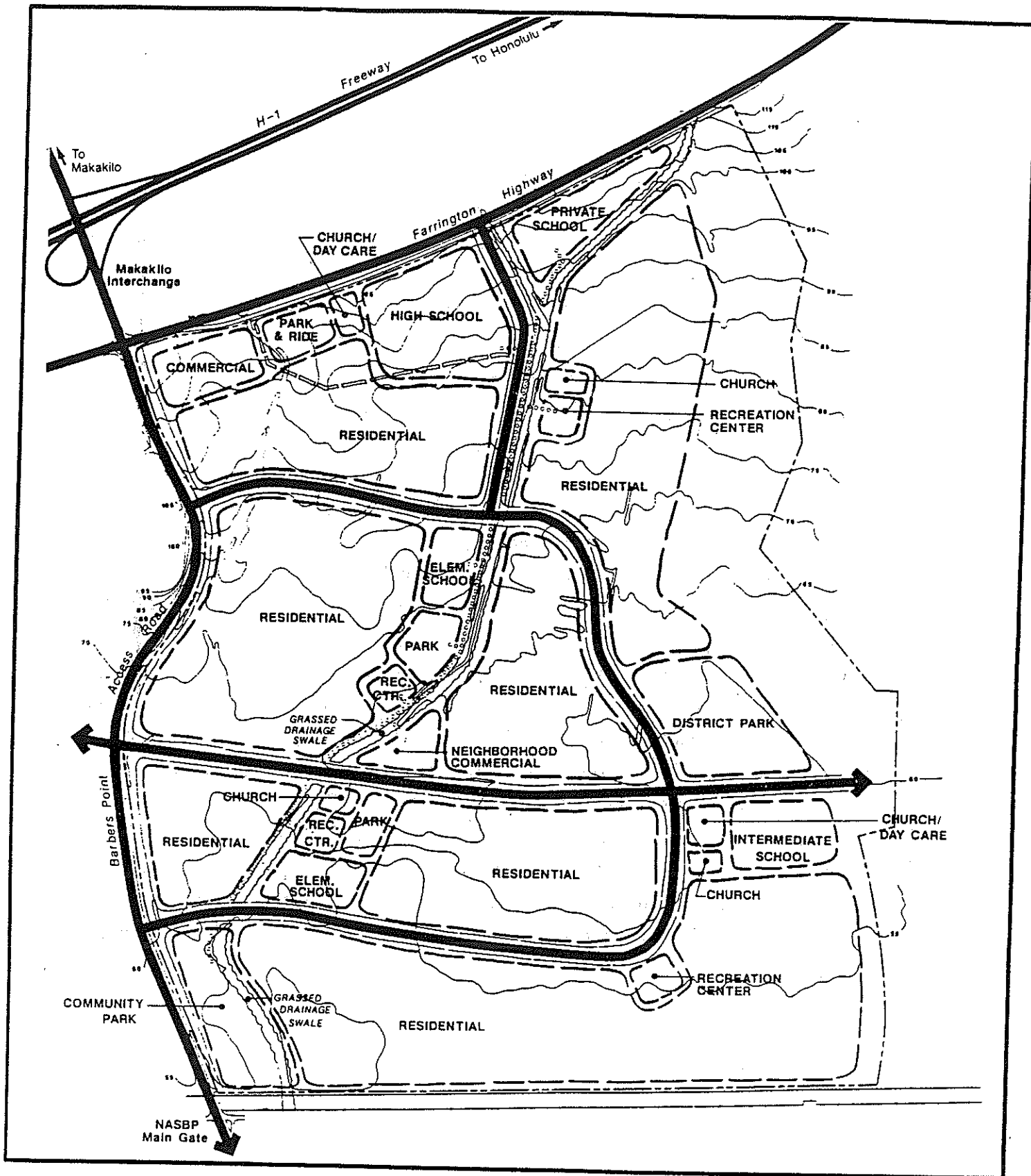


Kapolei Village
ALTERNATIVE NO.2

Ewa, Oahu, Hawaii



Figure:
3-2



Kapolei Village
ALTERNATIVE NO.3
 Ewa, Oahu, Hawaii



Figure:
3-3

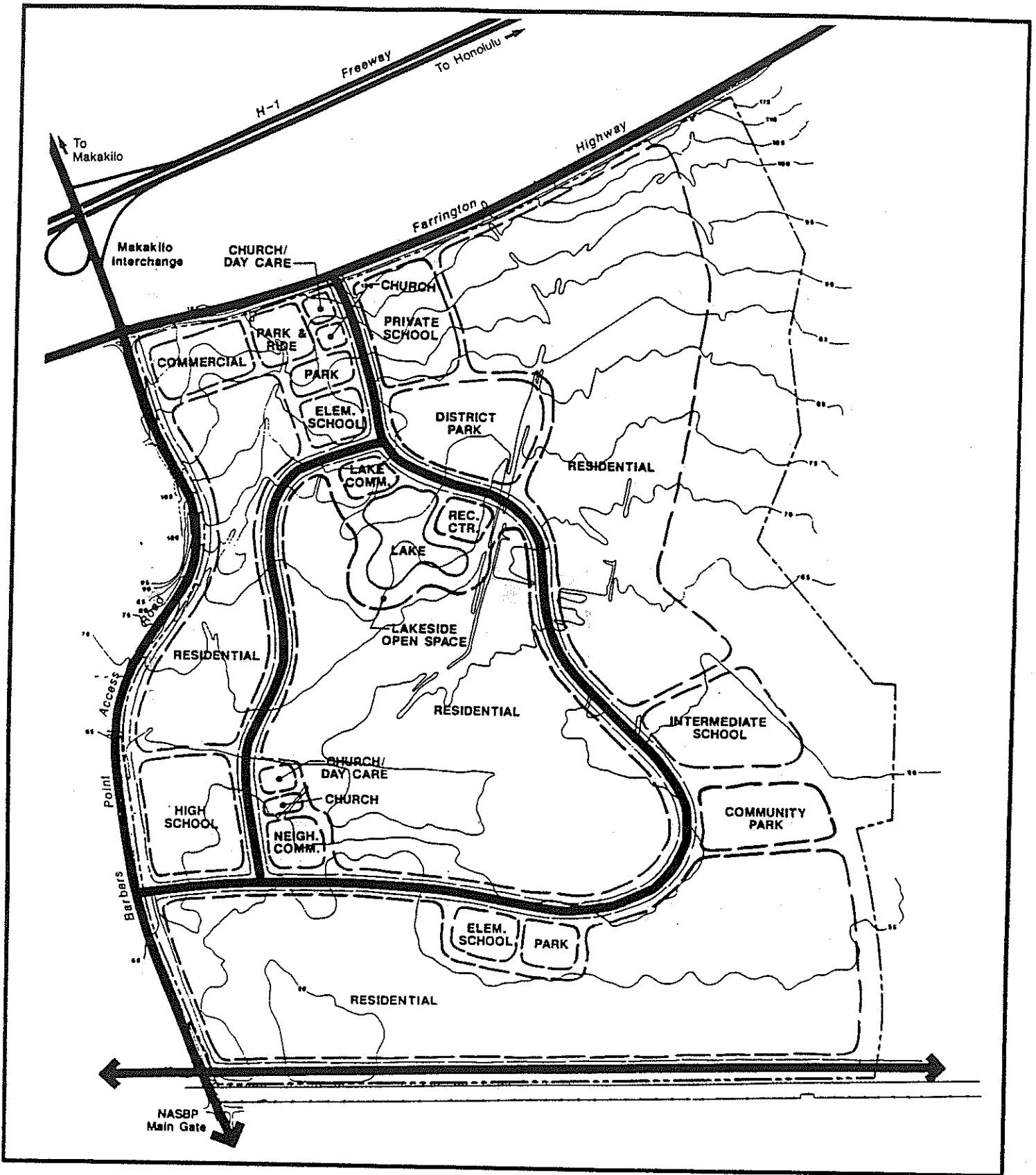
basic circulation system of the plan is simple with a major internal loop road oriented towards Barbers Point Access Road, and additional access to Farrington Highway. Another important attribute of Alternative 3 is the addition of four recreation centers, approximately 2 acres each in size. The recreation centers would be located in each of the four quadrants of the development and would provide a neighborhood focus for each of these four quadrants. Typical amenities of the recreation centers would include a swimming pool, a children's playground, changing rooms, meeting rooms, and office area, possible tennis courts, and parking areas. Also, the proposed Ewa Parkway right-of-way is sited along the Waimanalo Road alignment.

3.3.4 Alternative 4

A dominant design feature of Alternative 4 is the use of a central lake (approximately 10 acres of water). Strategically located at the intersection of the entrance road from Farrington Highway and the central internal loop road, the lake would provide a primary design influence and would create an identity for the entire development. Surrounding the lake would be a 10-acre park area providing public open space and access to the lake perimeter. Adjacent to the lake is a "lake side commercial" area, identified for specialty commercial uses including restaurants and other "resort related" commercial uses. Also adjacent to the lake is a recreation center taking advantage of the vast amount of open space. A major change made in this plan is the omission of the major east-west roadway common to all other four plans. The road system provides for principal access from Farrington Highway with additional access to Barbers Point Access Road. Ewa Parkway is sited adjacent to the OR&L ROW at the southern boundary of the project site (Figure 3-4).

3.3.5 Alternative 5

The major design element of Alternative 5 is the addition of an 18-hole golf course to the project site (Figure 3-5), creating an identity to the overall project. Because of extensive acreage requirements, only 12 holes of the golf course (approximately 10 acres) are shown with an additional

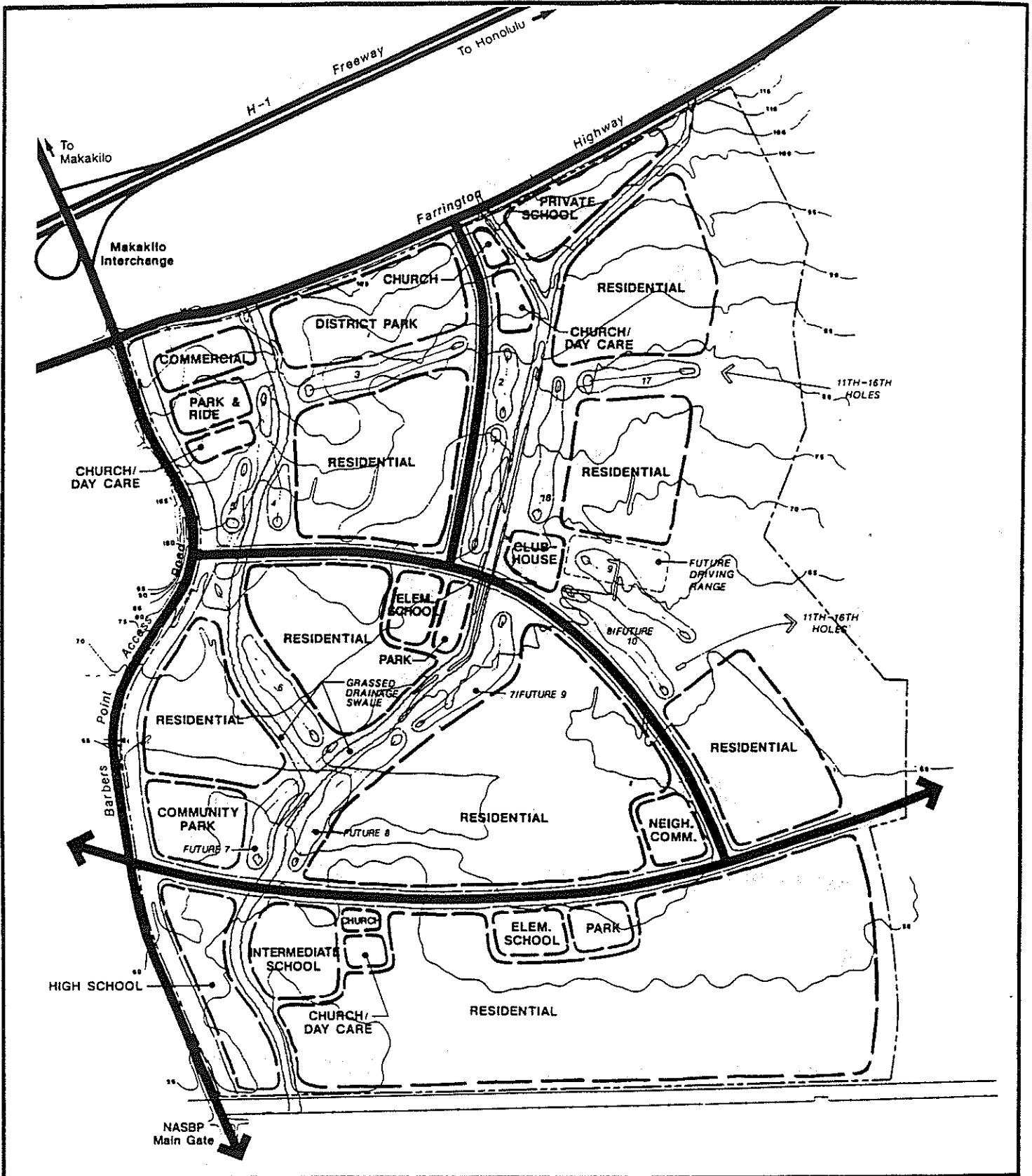


Kapolei Village
ALTERNATIVE NO.4
 Ewa, Oahu, Hawaii



0' 1000'

Figure:
 3-4



Kapolei Village
ALTERNATIVE NO.5
 Ewa, Oahu, Hawaii



0' 1000'

Figure:
 3-5

six holes to be developed on lands east of the project site. A benefit of the golf course, aside from its amenity value, is its ability to internalize the cost of maintaining drainage swales through the project site to the golf course operator. These channels/swales have been integrated into the course fairways. The roadway system is perhaps the most simplified of all five alternatives providing for one major access point at Farrington Highway and two access points at Barbers Point Access Road.

The addition of a golf course to the project site will generate a premium for residential lots facing the golf course. This premium will result in higher priced houses and correspondingly increase the range of housing type offered within the development. This in turn would increase the market size and socio-economic range of residents in the project.

3.4 CONCLUSION

Elements of the alternative concept plans were evaluated with the best features of each plan implemented into a preferred alternative plan. This preferred alternative plan was then refined to become the recommended "master site plan" of the proposed project site.

SECTION 4

**RELATIONSHIP TO LAND USE, POLICIES,
AND CONTROLS OF THE AFFECTED AREA**



SECTION 4
RELATIONSHIP TO LAND USE, POLICIES AND
CONTROLS OF THE AFFECTED AREA

4.1 THE HAWAII STATE PLAN

The Hawaii State Plan represents a guide for the future of Hawaii. The State Plan sets forth a broad range of goals, objectives, and policies to serve as guidelines for growth and development of the State and establishes a coordination system between the State and County agencies. Chapter 226, Hawaii Revised Statutes (as amended, 1986) states the following purpose of the State Plan:

"[it] shall serve as a guide for the future long-range development of the State; identify the goals, objectives, policies, and priorities for the State of Hawaii; provide the basis for determining priorities and allocating limited resources, such as public funds, services, manpower, land, energy, water, and other resources; improve coordination of state and county plans, policies, programs, projects, and regulatory activities; and to establish a system for plan formulation and program coordination to provide for an integration of all major state and county activities." (Chapter 226-1: Findings and Purpose, HRS)

The proposed project is generally consistent with objectives and policies of the Hawaii State Plan, although the proposed project will result in the loss of important agricultural land. The following sections analyze relevant goals, objectives, policies and guidelines of the State Plan to the proposed project.

A. Section 226-5 Objectives and Policies for Population

Kapolei Village will contribute to the distribution of future growth expectations of the Secondary Urban Center by providing a well managed community offering a mix housing types and community support facilities.

the West Beach-Makakilo area while maintaining cooperation with government agencies the sugar industry. Kapolei Village is planned to be developed in incremental stages with a phased withdrawal of sugarcane fields.

4.4.6 Culture and Recreation

The concern of this section applicable to the proposed project is the provision of a wide range of recreational opportunities "readily available" to the people of Oahu. Included in this section are policies of developing and maintaining a variety of park and beach facilities. As noted earlier, the design of Kapolei Village allows for a variety of recreational opportunities.

4.5 EWA DEVELOPMENT PLAN

The Ewa Development Plan (Census Tracts 83-86.02) of the City and County of Honolulu acts as a detailed structure of General Plan objectives for that area. The Ewa Development Plan area includes the area of coral plain from the Waipahu and Pearl Harbor boundaries to Nanakuli. Regarding development of the Ewa area, the Development Plan states:

"Relevant General Plan policies for Ewa encourage the gradual development of a secondary urban center in order to relieve development pressures in the urban-fringe and rural areas."

Kapolei Village will be consistent with the Ewa Development Plan objectives and design elements. Currently, the majority project site is designated as Agriculture on the Ewa Development Plan Land Use Map. Other designations within the project site boundaries include Commercial and Public Facility, located along Barbers Point Access Road. An amendment to the agricultural land use designation will be necessary before development of the proposed project.

4.6 COUNTY ZONING

The entire proposed project site is currently zoned for agricultural use (AG-1 Restricted). A change in the zoning designation for planned urban

collected and disposed of by the City and County of Honolulu and private refuse collection services.

G. Section 226-16 Objectives and Policies for Facility Systems - Water

The development of Kapolei Village will incorporate the use of a water system supplying brackish water for irrigation purposes and potable water for residential use and human consumption.

H. Section 226-17 Objectives and Policies for Facility Systems - Transportation

The proposed project will add to traffic volumes in and around the project site. Measures to mitigate the increased traffic include a Park-and-Ride facility and roadway improvements to both on-site and off-site roadways.

I. Section 226-18 Objectives and Policies for Facility Systems - Energy/Telecommunications

Energy and telecommunication facilities necessary for the development of Kapolei Village will be planned and coordinated with the appropriate agencies and public utilities.

J. Section 226-19 Objectives and Policies for Socio-Cultural Advancement - Housing

The proposed project is designed to accommodate a variety of housing types suited to families with incomes ranging from very low to upper middle. Kapolei Village will be consistent with this section by offering a mix of housing types, (including gap-group, assisted, elderly and market housing) and costs to suit the needs of a large portion of the housing market. The development concept behind the proposed project is to provide a 60/40 percentage split between affordable and market housing, respectively. Affordable housing will be priced to accommodate very low to median income families whereas market units will be

priced according to appraised market values. Integral planning of the overall development will provide necessary support facilities for these housing areas.

K. Section 226-20 Objectives and Policies for Socio-Cultural Advancement - Health

Medical and health care facilities are currently located in Waipahu and Honolulu with emergency services provided by the Kaiser Moanalua Hospital or the Waianae Comprehensive Health Center. There are anticipated increases of medical and health care facilities for the Ewa area as the development of the SUC occurs. Construction of the St. Francis Hospital has already begun with a new facility located on Fort Weaver Road, east of the project site. Additionally, the abundance of recreational facilities planned within the development and vicinity will promote "wellness" through physical and mental health.

L. Section 226-21 Objectives and Policies for Socio-Cultural Advancement - Education

The Kapolei Village master plan provides for educational facilities of all levels. Within the plan are two elementary schools, one intermediate school and one high school, as well as day care centers for small children. Close cooperation with the Department of Education will be maintained to assure adequate provision of educational services.

M. Section 226-23 Objectives and Policies for Socio-Cultural Advancement - Leisure

Recreational facilities will be provided within the development offering a variety of activities including an 18-hole golf course, small neighborhood parks, a community park and two recreation centers. These facilities, as well as school sites provide an abundant amount of open space within the project site.

N. Section 226-104 Population Growth and Land Resources Priority Guidelines

Development of Kapolei Village will result in the loss of approximately 735 acres of agricultural land currently used for sugarcane cultivation. Although this land is agriculturally significant, urban use of the land is acceptable when the scope, planning, and socio-economic benefits of the proposed project are considered.

The project site was not determined to be environmentally critical in the areas of archaeology, flora and fauna. Any environmental impacts resulting from development will be mitigated where possible. The development of the site will result in the permanent loss of open space as it exists, however, the master plan of the project is designed with open space areas including parks and golf course fairways.

O. Section 226-106 Affordable Housing, Priority Guidelines for the Provision of Affordable Housing

The proposed project will incorporate a mix of housing types to include gap-group, assisted, market and elderly housing. Chapter 359G-10.5, Hawaii Revised Statutes, allows the HFDC to shorten the processing requirements which contribute to the cost of housing. These savings are then passed on to households not able to purchase housing in the open market. Chapter 359G-10.5 also allows the HHA to develop projects that include market units with the net income gained from the sale of these units used to help reduce cost of affordable units. Chapter 359G-10.5 allows for a 60/40 percent housing mix between affordable and market units whereby at least 60 percent of the units must be available in price ranges within the purchasing power of lower income buyers.

4.2 STATE FUNCTIONAL PLAN

The Hawaii State Plan is used as the primary tool for directing the planning process for Hawaii's long-term and short-term goals. Functional

plans, created as extensions of the State Plan, are prepared by the appropriate State agencies to specify objectives, policies and implementation actions of their respective concerns. These plans were reviewed and evaluated with regard to the proposed project. The following are descriptions of functional plans applicable to the proposed project.

4.2.1 Education Plan and State Higher Education Plan

This functional plan relates to educational functions, school systems, goals and growth. Topics within the plan are organized under four categories: personal skills and knowledge; employability and economy; social and natural resources; and educational support services.

Development of Kapolei Village, as well as neighboring communities, will result in an increased demand for educational facilities for the Ewa area. The proposed project will include a wide range of educational facilities to include two elementary schools, one intermediate school, and one high school.

4.2.2 Housing Plan

This functional plan, managed by the Housing Finance and Development Corporation, deals with orderly development of housing and expanded housing opportunities for Hawaii's people. Objectives of the functional plan are to:

"develop greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, liveable homes located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals";

"assist the orderly development of residential areas sensitive to community needs and other land uses."

An innovative concept of the proposed project is to offer a wide range of housing types with varying costs. The Kapolei Village project will address the need for affordable housing by providing homeownership and rental opportunities to families with varied income levels. For-sale units will be available to families whose income levels are too low for conventional home buying methods. Additionally, market and elderly housing units, included as part of the Kapolei Village Master Plan, assures a diversity of housing opportunities to serve a wide socio-economic range of households. Housing within the development will include approximately 5,000 units. Of these units, a minimum of 60 percent will be affordable housing (gap-group, assisted, and elderly), and a maximum of 40 percent will be market housing.

4.2.3 Health Plan

The primary purpose of the State Health Plan is to serve as a guide for State and County agencies and the private sector in outlining environment related objectives and health care objectives for Hawaii. This plan, under the jurisdiction of the State Department of Health (DOH), focuses on: "preventing disease and promoting healthful life styles and environmental conditions; ensuring and promoting appropriate provisions and access to health care; protecting society from potential dangers; and enhancing the quality of air, land and water resources and preventing environmental degradation."

Currently, there are no health care facilities are located within the area of the project site and are expected to accommodate additional population generated from the development. However, a new medical facility is currently being constructed in Ewa, located along Fort Weaver Road, south of the H-1 Freeway.

Environmental concerns expressed in the functional plan have also been addressed in their respective sections of this document. Minimal adverse impacts of utilities such as drainage and sewerage are expected to occur from the development. Air and noise quality impacts are also expected to be minimal. Mitigation measures of adverse impacts will be implemented as necessary.

4.2.4 Agricultural Plan

Major concerns addressed within this plan include: "Hawaiian agriculture and the underlying needs and requirements of the commodity industries for resources such as land, water, capital, human resources and transportation; and for government support in the areas of farm management, cultural practices, livestock production, waste management, government regulation, pest and disease control, handling and processing, marketing, and research and development."

Specific objectives include increased viability in the sugar and pineapple industries and continued growth and development of diversified agriculture throughout the State. Lands found "suitable and used, or potentially usable for agricultural production," are identified as important agricultural lands by the State Department of Agriculture.

Development of Kapolei Village will result in the loss of approximately 735 acres of usable agriculture land which is currently under cultivation by the Oahu Sugar Company. It has been determined that a phased withdrawal of sugarcane cultivation in the project site will not affect viability of the Oahu Sugar Company. Additionally, urbanization of the project site is supported by the General Plan and the Ewa Development Plan of the City and County of Honolulu.

4.2.5 Transportation Plan

General objectives of this functional plan are to ensure an efficient multi-modal transportation servicing statewide needs of movement of people and goods, and to ensure a transportation system supportive of statewide growth. The functional plan is divided into five major topics addressing each mode of transportation, as well as statewide transportation planning and energy conservation.

Kapolei Village will provide an efficient on-site transportation network of roadways to effectively meet demands. Additionally, off-site roadway improvements will be provided, adjacent to the project site. These transportation mitigating measures, discussed in greater detail in

Appendix B, are presented in an effort to meet general objectives of the functional plan.

4.2.6 Recreation Plan

The Department of Land and Natural Resources is responsible for the State Recreational Plan. This functional plan reviews demands and actions needed to fulfill existing and future recreation demands. Other objectives of the plan include "guiding State and County agencies in acquiring and preserving lands of recreational value, and ensuring public access to recreational areas."

Kapolei Village will be consistent with the functional plan by providing a variety of passive and active recreational facilities. Neighborhood parks, a community park, recreation centers, and an 18-hole golf course are all planned within the development.

4.3 STATE LAND USE LAW

The State Land Use Commission has classified all land in the State to one of four classifications: Urban, Rural, Agricultural, and Conservation. The entire proposed project site lies within an agricultural district boundary. For development of the proposed project, a change in classification from agricultural to urban is necessary. Decision-making criteria for district boundary amendments include: conformance to "goals, objectives, and policies of the Hawaii State Plan and adopted functional plans; conformance to applicable district standards; and impacts on areas of Statewide concern." Kapolei Village coheres to these amendment concerns.

4.4 GENERAL PLAN OF THE CITY AND COUNTY OF HONOLULU

The General Plan of the City and County of Honolulu provides a statement of long range social, economic, environmental, and design objectives for the Island of Oahu and a statement of policies necessary to meet these objectives. Sections of the General Plan relevant to the proposed project include:

4.4.1 Population

This section is concerned with growth management of the island's population and promoting a balance between society, the economy and the environment. Also indicated within this section is a policy concerning growth of a "secondary urban center located in the West Beach-Makakilo area to relieve developmental pressures in the urban-fringe areas."

4.4.2 Natural Environment

This section is directed at preserving and enhancing the natural environment of Oahu. Kapolei Village will include in its design an efficient surface drainage and flood control system to preserve the natural setting. The development will also use natural slopes in the development design, taking advantage of views seen from northern portions of the project site.

4.4.3 Housing

Affordable housing with support facilities, as well as housing proximity to employment, recreation, commercial centers are expressed concerns within this section. The Kapolei Village Master Plan provides for a mix of housing types including gap-group, assisted, elderly, and market units along with appropriate support facilities.

4.4.4 Transportation and Utilities

Efficient and cost effective means of transportation are emphasized in this section, as well as providing a variety of transportation modes. Additionally, bus transportation will be provided as needed. Utility objectives include adequate amounts of water, efficient waste disposal systems, and high levels of service of all utilities. The proposed project is designed with efficient roadway and utility systems to adequately serve the community.

4.4.5 Physical Development and Urban Design

This section focuses on coordination with sequencing of "all new developments" and to preserve the physical character of older developments. This section also encourages development of the secondary urban center in

the West Beach-Makakilo area while maintaining cooperation with government agencies the sugar industry. Kapolei Village is planned to be developed in incremental stages with a phased withdrawal of sugarcane fields.

4.4.6 Culture and Recreation

The concern of this section applicable to the proposed project is the provision of a wide range of recreational opportunities "readily available" to the people of Oahu. Included in this section are policies of developing and maintaining a variety of park and beach facilities. As noted earlier, the design of Kapolei Village allows for a variety of recreational opportunities.

4.5 EWA DEVELOPMENT PLAN

The Ewa Development Plan (Census Tracts 83-86.02) of the City and County of Honolulu acts as a detailed structure of General Plan objectives for that area. The Ewa Development Plan area includes the area of coral plain from the Waipahu and Pearl Harbor boundaries to Nanakuli. Regarding development of the Ewa area, the Development Plan states:

"Relevant General Plan policies for Ewa encourage the gradual development of a secondary urban center in order to relieve development pressures in the urban-fringe and rural areas."

Kapolei Village will be consistent with the Ewa Development Plan objectives and design elements. Currently, the majority project site is designated as Agriculture on the Ewa Development Plan Land Use Map. Other designations within the project site boundaries include Commercial and Public Facility, located along Barbers Point Access Road. An amendment to the agricultural land use designation will be necessary before development of the proposed project.

4.6 COUNTY ZONING

The entire proposed project site is currently zoned for agricultural use (AG-1 Restricted). A change in the zoning designation for planned urban

use will be required at the appropriate time by the Department of Land Utilization.

4.7 COASTAL ZONE MANAGEMENT/SMA RULES AND REGULATIONS

Objectives and policies of the Coastal Zone Management Program are described in Chapter 205A-2, Hawaii Revised Statutes (HRS), Part I. Special Management Area guidelines are found in Part II of the same chapter. The proposed project site is not located within a Special Management Area and therefore, a Special Management Area permit is not required.

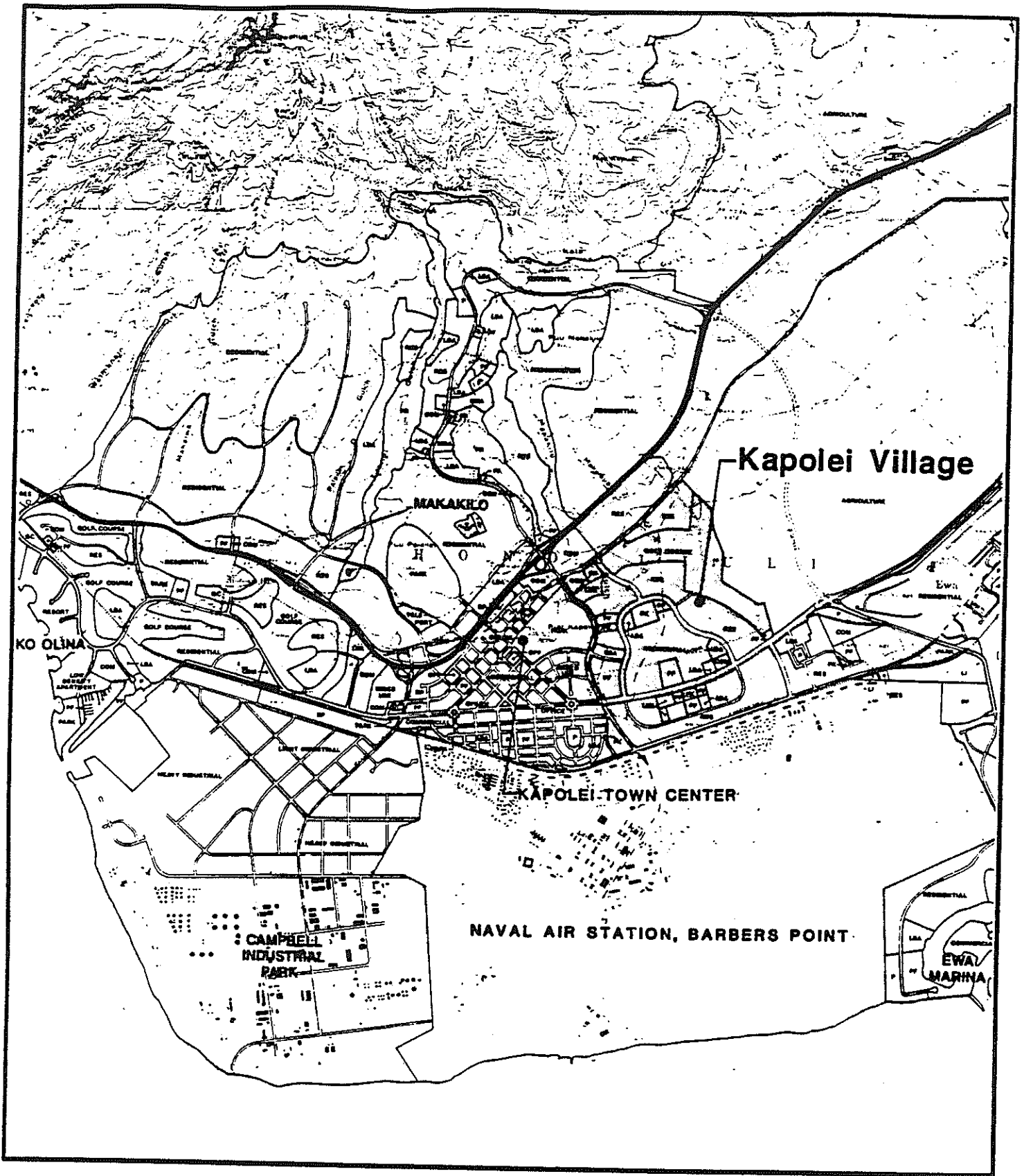
4.8 ENVIRONMENTAL IMPACT STATEMENT (Chapter 343, HRS)

Chapter 343 outlines the necessary procedures and contents of environmental impact statements. The chapter states: "environmental review at the state and county levels shall ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations." This environmental impact statement is prepared in accordance with the legislative mandates of Chapter 343, HRS. The requirement of an environmental impact statement was determined pursuant to Chapter 200 of Title 11, Administration Rules, Subchapter 5(b).

4.9 CAMPBELL ESTATE MASTER PLAN

The Estate of James Campbell is the major landowner in the Ewa area with approximately 34,000 acres of land within the Ewa Plain. The Estate maintains a planning program to coordinate the long range development of their Ewa lands.

Kapolei Village is consistent with the Campbell Estate Master Plan in that the Master Plan provides for the development of a planned residential community on the proposed project site. Existing and proposed uses of the long range plan are identified in Figure 4-1.



Kapolei Village
CAMPBELL LONG RANGE PLAN
 Ewa, Oahu, Hawaii



Figure:
 4-1

SECTION 5

**ASSESSMENT OF EXISTING CONDITIONS:
PHYSICAL ENVIRONMENT**



SECTION 5
ASSESSMENT OF EXISTING CONDITIONS:
PHYSICAL ENVIRONMENT

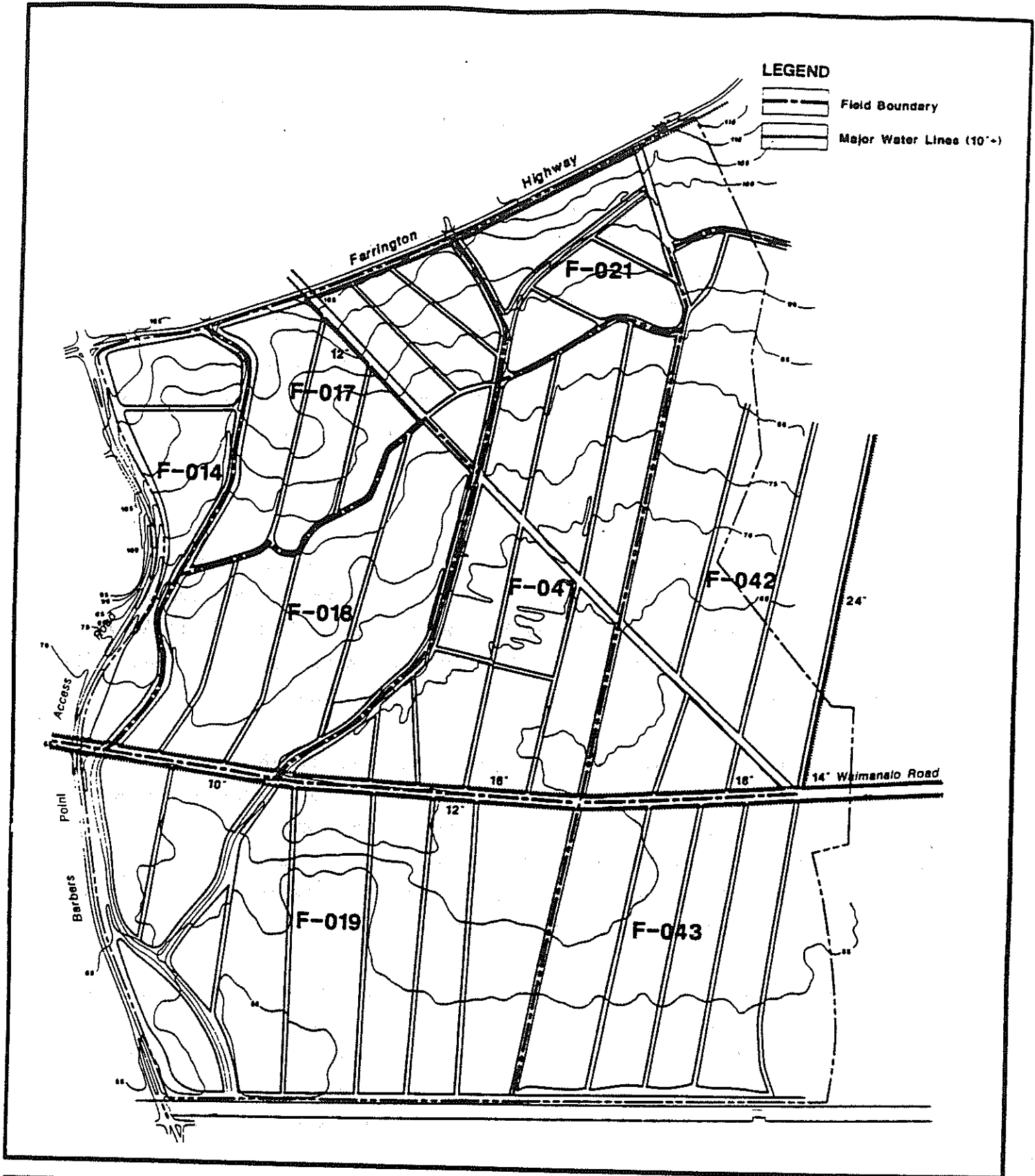
5.1 EXISTING USES AND OWNERSHIP

The 830-acre project site is owned by the Estate of James Campbell and is leased to the Oahu Sugar Company (OSCo) for sugarcane cultivation. The project site is identified as lying within Zone 9, Section 1, Plat 16 and encompasses all of Parcel 23 and a portion of Parcel 25. Campbell Estate owns lands surrounding the project site with the exception of: Barbers Point Access Road and Makakilo Interchange owned by the State of Hawaii; Fort Barrett Park (Puu Kapolei) and Farrington Highway owned by the City and County of Honolulu; and Naval Air Station, Barbers Point (NAS BARPT) owned by the Federal Government.

The entire project site is currently under sugarcane cultivation by OSCo. The site contains five fields: 14, 17, 18, 19 and 41; and portions of three other fields: 21, 42 and 43 (Figure 5-1). Fields 14 and 18 were harvested at the end of April 1987, with field 42 harvested in August 1987. Fields 17, 21 and 41 were planted in mid to late 1986.

OSCo maintains an agricultural water system within the project site consisting of 18-inch transit mains along Farrington Highway and Waimanalo Road and a series of 10-inch, 12-inch and 14-inch laterals. A major 24-inch main intersects with the Waimanalo 14-inch main at the extreme eastern side of the project. OSCo maintains 12 KV power lines servicing water pumping facilities located on the project site.

Waimanalo Road crosses the project site in an east-west direction and provides the major transportation corridor for sugarcane hauling activities in the area. Waimanalo Road provides a link from the Waipahu Sugar Mill to the fields in Ewa, including those west of the project site. Discussions with OSCo indicate the importance of maintaining Waimanalo Road as a major east-west agricultural roadway until the year 1995.



Kapolei Village
OAHU SUGAR CO. FIELD MAP
 Ewa, Oahu, Hawaii



Figure:
5-1

5.1.1 On-Site Encumbrances

A number of easements run through the project site (Figure 5-2) and described below:

A. U.S. Navy Water Line

This is a perpetual easement granted by the Estate of James Campbell to the Federal Government for use as a road (jointly with grantor and other tenants) and for constructing, operating, maintaining and repairing a 24-inch water pipeline.

The pipeline extends from the Navy's well field, located north of the project site (TMK 9-1-16:10), through the site and into NAS BARPT. Under the terms of the easement, the Navy is restricted to pumping less than 5 mgd from the well field unless Campbell Estate permits a greater withdrawal.

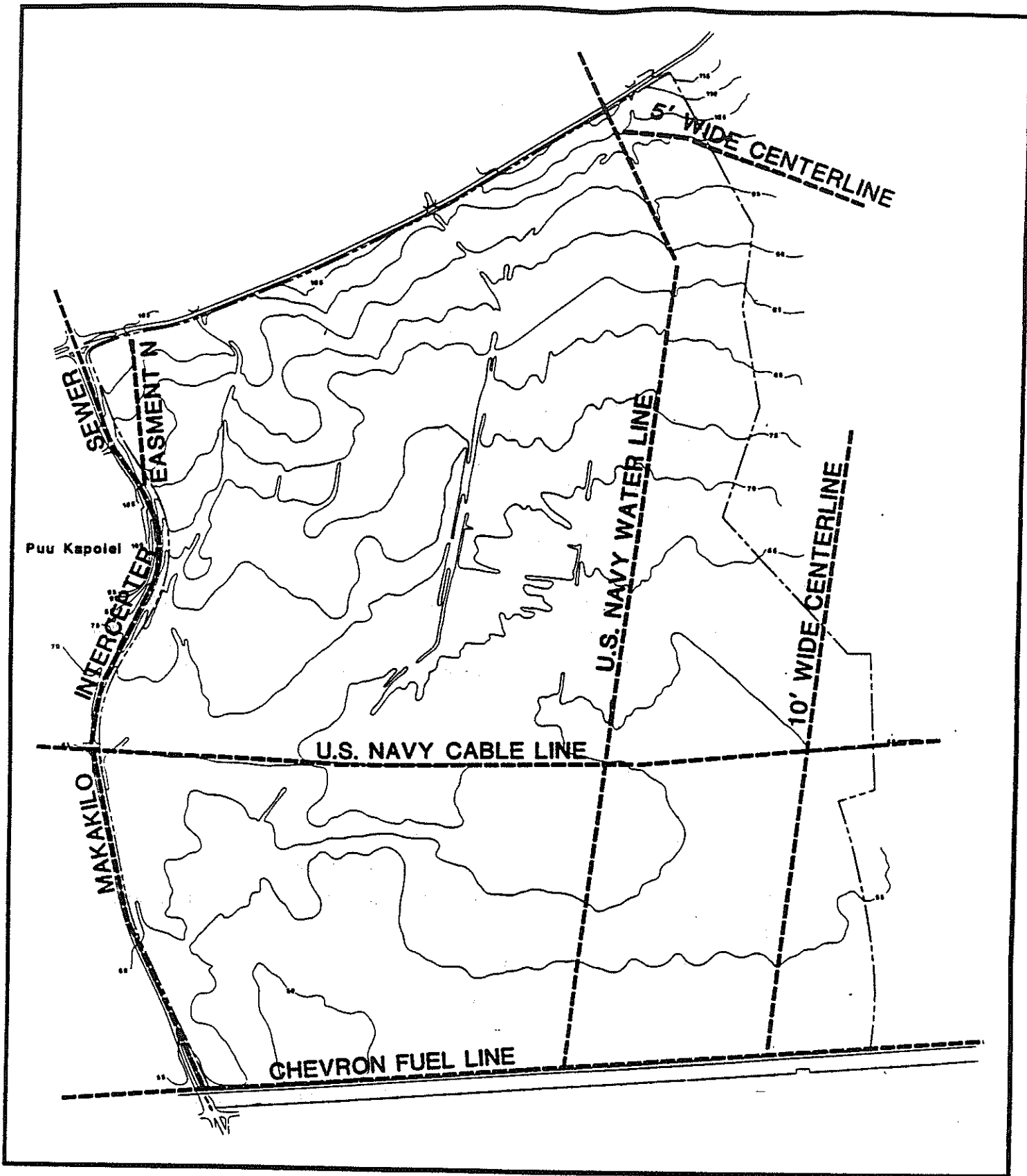
The pipeline easement is referred to as Lot 221 as it crosses the project site. The easement is approximately 7,800 feet in length (Farrington Highway to OR&L ROW) and 3.678 acres in size, with an approximate width of 20.54 feet.

B. Chevron Fuel Line

This is an 8-inch "black oil" line heated by adjacent 4-inch hot water line linking Chevron Refinery with its Honolulu Harbor terminal and Hawaiian Electric Company's Iwilei tank farm. The line runs along a 15-foot easement at the southern boundary of the project site (north of the OR&L ROW) under an existing agricultural road. A minimum of 48 inches is allowable for pipeline burial below roadways.

C. U.S. Navy Cable Line

This is identified as a 5-foot wide centerline easement lying along Waimanalo Road. Discussions with Campbell Estate



Kapolei Village
ON-SITE ENCUMBRANCES

Ewa, Oahu, Hawaii



Figure:
 5-2

representatives indicate that this was an easement for a Navy cable which has since been quitclaimed back to Campbell Estate and is therefore no longer an encumbrance.

D. Makakilo Interceptor Sewer

The sewer line extends from the abandoned Makakilo WWTP, south along Barbers Point Access Road and east to the Honouliuli WWTP. Portions of this easement cross the Barbers Point Access Road frontage of the project site.

E. 10-Foot Wide Center Line Easement

This easement follows an agricultural roadway easement extending from the southeast corner of the project site. The easement originates at the Farrington Highway/Palehua Access Road intersection, east of the project and terminates at the southern boundary of the project site.

F. 5-Foot Wide Center Line Easement

This easement appears to follow another agricultural roadway and crosses the project site at the northeast corner.

G. Easement N

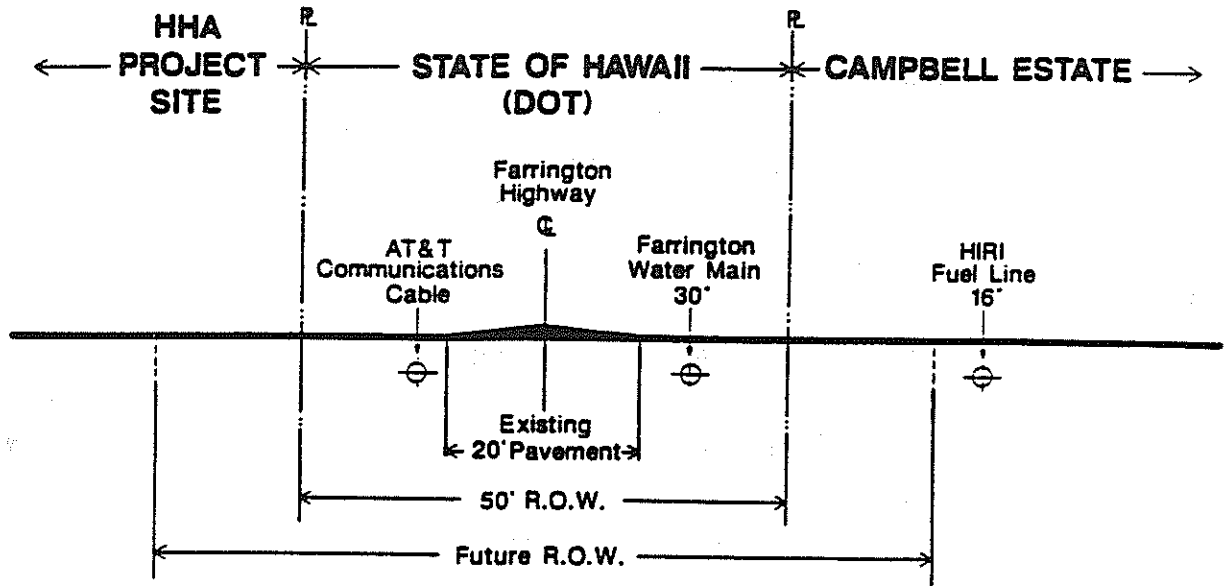
This is a 12-foot wide irrigation line easement which crosses the property at the extreme northwest corner.

5.1.2 Detail of Northern and Southern Boundaries

Figure 5-3 illustrates typical sections of the northern and southern boundaries of the project site. The northern boundary shows existing 50-foot and proposed 80-foot right-of-ways (ROW). An AT&T Communications cable is buried on the south side of the roadway pavement within the Farrington Highway ROW. The existing 30-inch Farrington water main and the Hawaiian Independent Refinery, Inc. (HIRI) fuel line are buried on the north side of the roadway pavement.

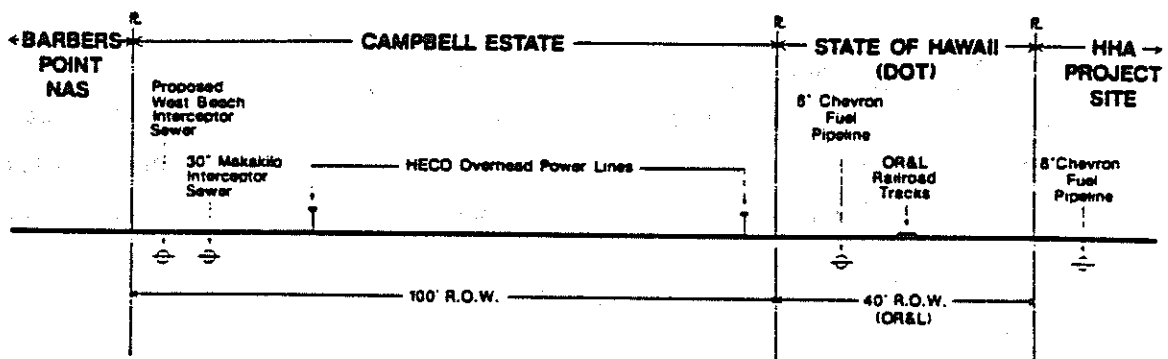
**TYPICAL SECTION THROUGH NORTHERN
BOUNDARY OF PROJECT SITE.**

Scale: 20' - 1"



**TYPICAL SECTION THROUGH SOUTHERN
BOUNDARY OF PROJECT SITE.**

Scale: 30' - 1"



Kapolei Village
TYPICAL BOUNDARY SECTIONS
Ewa, Oahu, Hawaii

Figure:
5-3

The southern boundary contains an existing 8-inch Chevron "black oil" line, shown within a 15-foot easement adjacent to the OR&L ROW. Another Chevron line, the "light oil" line, runs along a 15-foot easement just south of the railroad tracks within the State-owned OR&L ROW. To the south, within the 100-foot ROW owned by the Campbell Estate, are existing overhead power lines (Hawaiian Electric Company) and the 30-inch Makakilo Interceptor Sewer (Division of Wastewater Management). The proposed West Beach Interceptor will be placed next to the existing Makakilo Interceptor.

5.2 SURROUNDING LAND USES

A. Kapolei Town Center

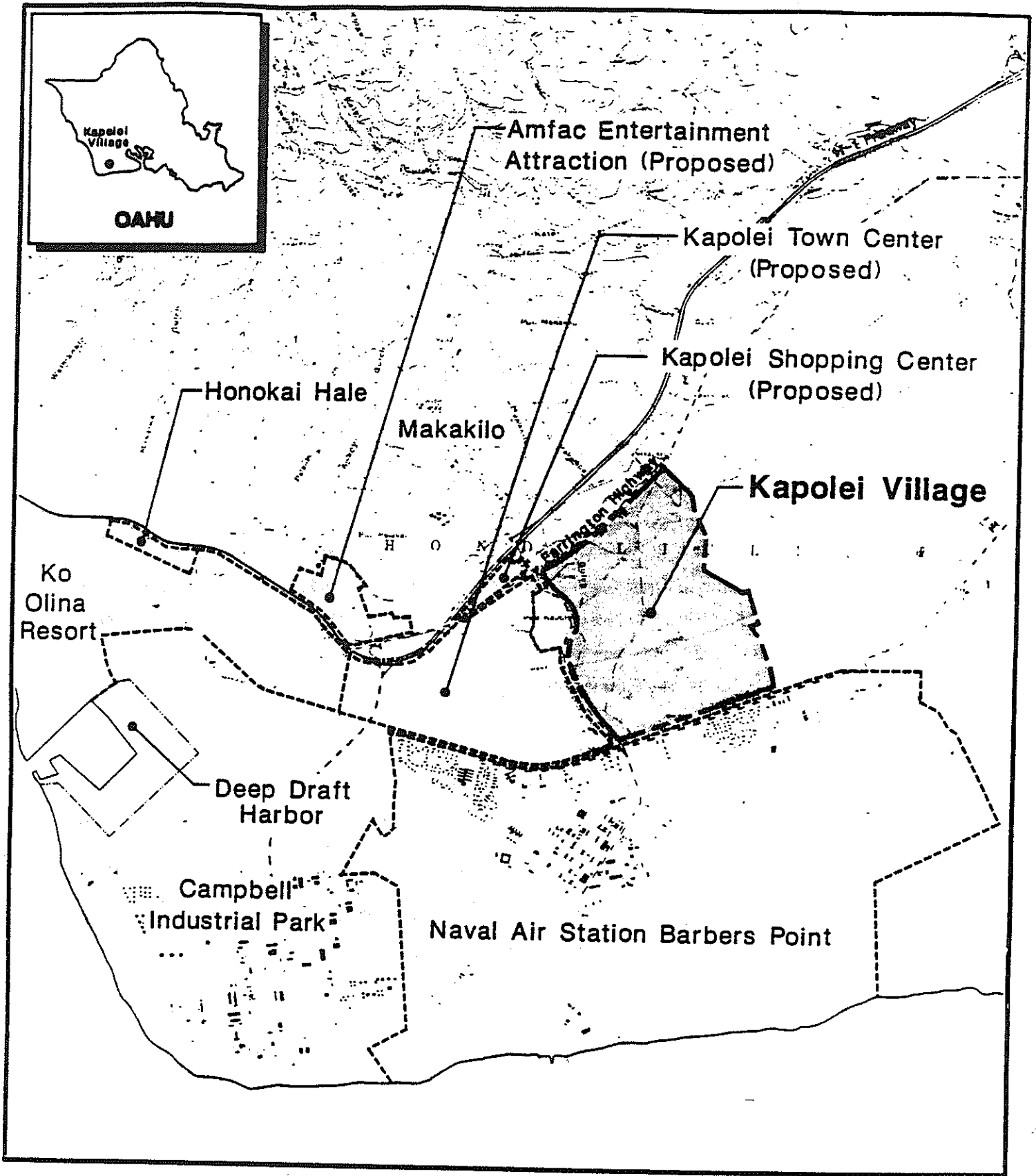
The Estate of James Campbell is pursuing the development of a 580-acre site immediately west of the project site called the "Kapolei Town Center" (Figure 5-4). The Town Center has been proposed to fulfill the long range growth policy of the City and County of Honolulu General Plan to establish a Secondary Urban Center in the Ewa Plain. The Estate has submitted a petition to the Land Use Commission to reclassify a portion of the Town Center site from the agricultural district to the urban district.

B. Makakilo

A 22-year old residential community consisting of mid priced, single family and multi-family housing is located on the lower slopes of the Waianae Range, north of the project site. About 2,400 housing units were built by 1985, with an estimated 2,700 units remaining to be built. Population of Makakilo in 1985 was 9,000 with ultimate future population estimated at 16,700 residents.

C. Honokai Hale/Nanakai Gardens

West of the project site, adjacent to the south of Farrington Highway lies the community of Honokai Hale/Nanakai Gardens. This is an older residential community with 500 moderately priced housing units. Population in 1985 included approximately 2,000 residents.



Kapolei Village
SURROUNDING LAND USES
 Ewa, Oahu, Hawaii

Figure:
 5-4

D. James Campbell Industrial Park

This industrial park is located southwest of the project site. The industrial park is approximately 2,400 acres in size with 1,360 acres absorbed and the remaining acreage available for future expansion. Users of the industrial park include a mix of heavy industrial and light industrial businesses. These enterprises provided employment for approximately 2,500 people in 1985.

E. Deep Draft Harbor

A partially completed deep draft harbor for which the primary basin has been completed, is located west of the industrial park. Development of wharf and dock facilities will be started with the first phase of development to begin in 1987. Complete development of the harbor and its facilities is expected to take 10 to 15 years.

F. Ko'Olina

Groundbreaking for the planned 970-acre Ko'Olina residential/resort community (formerly, the "West Beach Resort") took place on December 2, 1986. Land and infrastructure development began in March 1987 with completion anticipated for mid 1989. First phase development plans call for 5,200 housing units. Of these units, 3,700 are designated as high-rise apartment/condominium units. The remaining 1,500 units are planned for low rise, lower density attached units located around the golf course. Another 4,000 visitor units, consisting of hotel rooms and resort condominiums are also planned.

5.3 CLIMATE

The climate in the project area is generally dry with northeast tradewinds providing the predominant wind direction, blowing 85 percent of the time with an average velocity of 9 knots. The Ewa Plain experiences light rainfall of approximately 20 inches per year.

Temperatures in the area range from 69°F to 91°F. The warmest average monthly temperature is 80.7°F and the coolest month average temperature is 72.3°F. The highest temperature of record is 93°F, and the lowest temperature recorded is 53°F.

5.4 GEOLOGY, PHYSIOGRAPHY AND TOPOGRAPHY

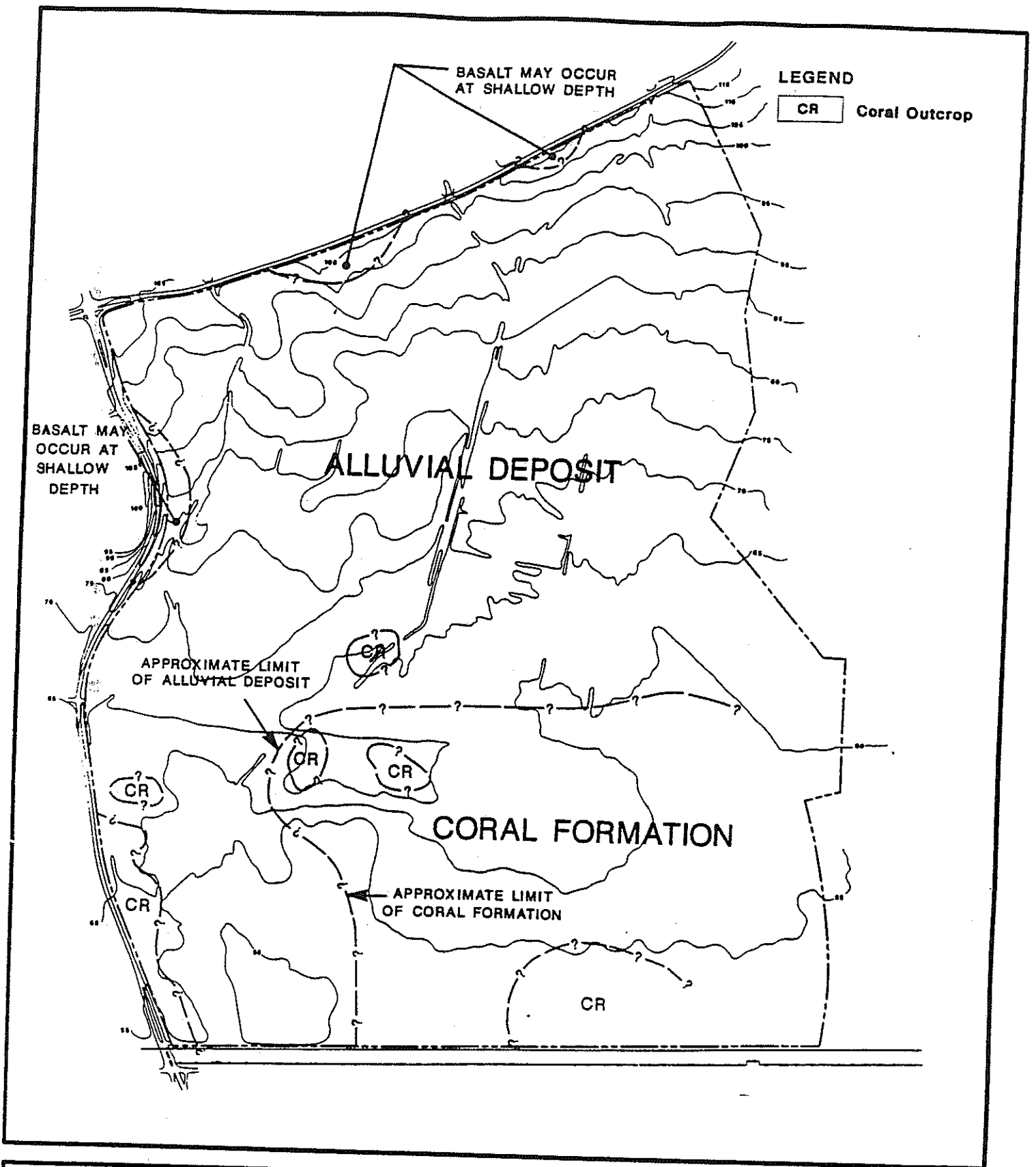
Geologic formations of the site include coral at shallow depths in the southeastern corner of the site and basalt rock at shallow depths in the northern and western portions of the site (Figure 5-5). Both formations are generally hard and may require ripping for excavation. The remainder of the site is made up of alluvial deposition.

The coral is generally hard and may require moderate ripping for excavation. The excavated coral material can provide a good source of low expansive structural fill. Cavities of varying sizes are often found in the coral formation. If encountered, backfilling of the cavities with grout or compacted fill may be required.

The basalt rock is generally hard and would require hard ripping to excavate. The excavated rock may produce many boulders which would have to be placed in the deeper fill areas.

The project site ranges in elevation from approximately 50 feet above mean sea level (MSL) at the southern boundary to approximately 115 feet MSL at the northeast corner. Approximately two-thirds of the site lies between 50 and 70 feet MSL.

The major topographic feature in the area is the Waianae Range forming the major backdrop of the project area. Intermediate features in the area include: Puu Makakilo (972 feet MSL), Puu Kapuai (1,047 feet MSL), Puu Palailai (492 feet MSL), all located directly north of the site; Puu Kapolei (166 feet MSL), located on the northwestern edge of the site; and two intermittent streams (Makakilo Gulch and Makalapa Gulch).



Kapolei Village
GEOLOGIC SOIL TYPES

Ewa, Oahu, Hawaii



0' 1000'

Figure:
5-5

The site slopes gently from the southwest corner near the access gate of NAS BARPT to the northeast corner adjacent to Farrington Highway. Average slope is less than one percent (0.7). Approximately 90 percent of the site ranges in slope from zero to two percent. The remaining area is in the two to four percent range with a few spot locations in the four to six percent range.

5.5 SOILS AND AGRICULTURAL POTENTIAL

Predominant soil types within the project site consist of Mamala stony silty clay loam 0 to 12 percent slopes, and Waialua silty clay 0 to 3 percent slopes. In general, most of the clays can be classified as low to moderately expansive. Local soft zones in the clay were encountered beneath drainage ditches, irrigation trenches and in areas where water leaked from irrigation hoses. Easy excavation and conventional site grading procedures are anticipated for earthwork on these areas. Some of these soils may be moderately expansive and could require special procedures for house foundation design, such as deep footings, subgrade saturation or capping with non-expansive soils.

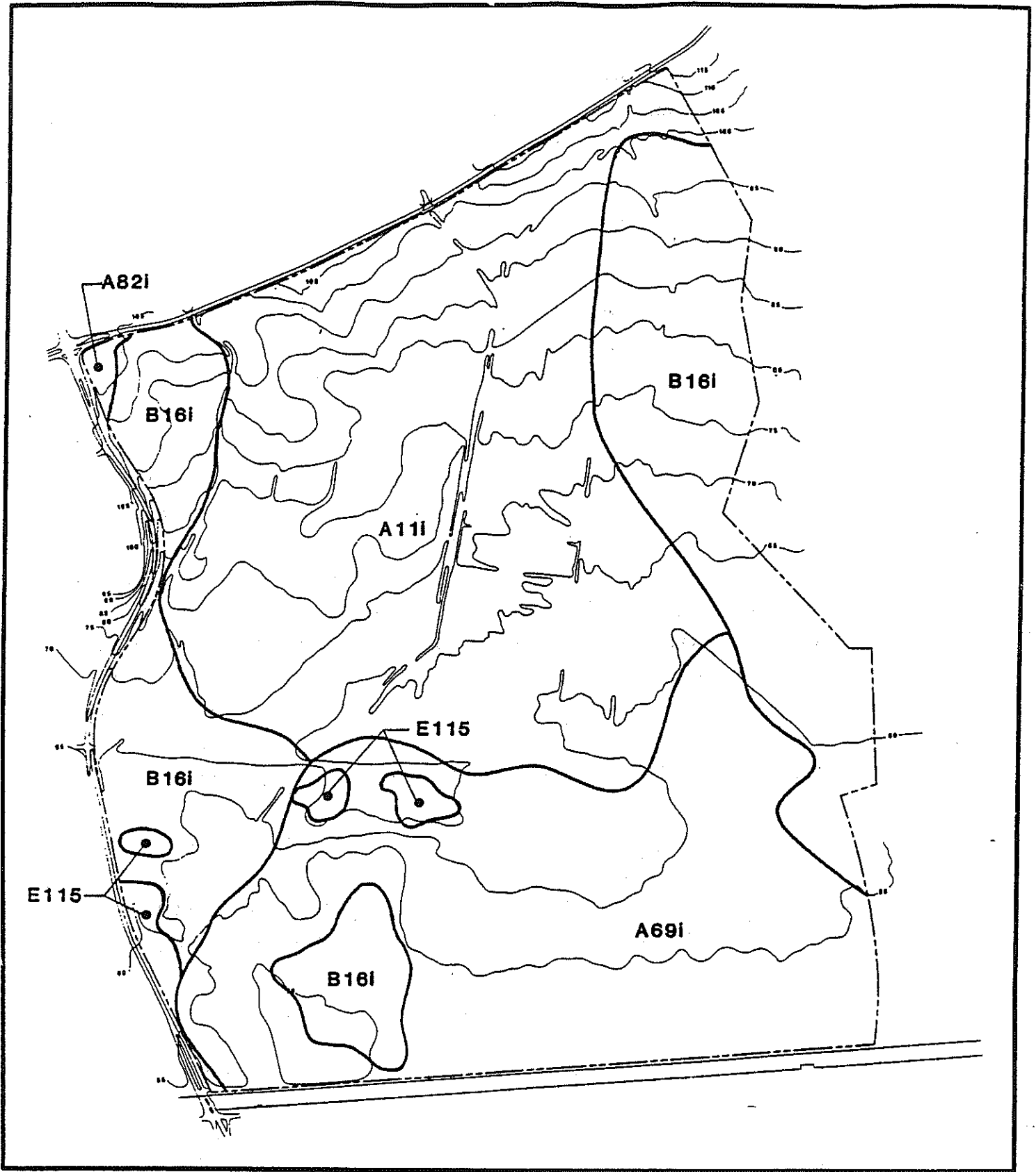
Soil studies conducted for Hawaii which analyze the suitability of different soil types include the Detailed Land Classification (Land Study Bureau, University of Hawaii), the Soil Conservation Service Soil Survey (U.S. Department of Agriculture Soil Conservation Service and University of Hawaii Agricultural Experiment Station), and the Agricultural Lands of Importance to the State of Hawaii (ALISH) system. The following are brief discussions of these studies and their respective applications to the project site.

The Detailed Land Classification reports were developed to provide land inventory and productivity evaluation based on State-wide standards of crop yields and levels of management. Land within the project site were found to have overall productivity ratings and land types of A69i (249 acres), AllI (329 acres), B16i (254 acres) and E115 (18 acres and corresponds to the

coral outcrop areas)(Figure 5-6). These findings indicate that most of the project site has good to very good productivity potential for most agricultural activities, if irrigated.

The Soil Conservation Service Soil Survey ranks soil types according to their suitability for most kinds of crops. These rankings are patterned after the nationwide soil classification. Also provided within the survey are listed of crops commonly grown on the soil types and their expected productivity under present management. Findings of the survey identify the predominant soils as (1) Ewa silty clay (EaB, EmA, EwA) with 0 to 6 percent slopes which is used for sugarcane, truck crops and pasture; (2) Honouliuli clay (HxA, HxB) with 0 to 6 percent slopes which is used for sugarcane, truck crops and pasture; (3) Waialua silty and stony silty clay (WkA, WIB) with 0 to 8 percent slopes which is used for sugarcane, pineapple and pasture; (4) Waiaphu silty clay (WzA) with 0 to 2 percent slopes which is used for sugarcane; (5) Molokai silty clay loam (MuC) with 0 to 3 percent slopes which is used for sugarcane, pineapple and pasture; (6) Mamala stony silty clay loam (MnC) with 0 to 12 percent slopes which is used for sugarcane, truck crops and pasture; (7) Kawaihapai stony silty clay loam (KlaB) with 2 to 6 percent slopes which is used for sugarcane, truck crops and pasture; and (8) Coral Outcrop (CR). The majority of crop capability classifications (i.e., general suitability for most kinds of crops) for these soils range from I to IIIe, when irrigated (soils with few limitations that restrict their use to soils with severe erosion hazard if cultivated and not protected). As a whole, according to the Soil Survey, nearly the entire project site is suited for a variety of agricultural uses. Land areas with coral outcrop are not cultivatable, but they represent only about 12 acres of the project site.

The ALISH system consists of mapped identification of three broad classifications of agricultural land, based in part on the Soil Conservation Service. These classifications are (1) Prime (591 acres), (2) Other Important (209 acres), and (3) Unique. Approximately 30 acres of the site, including areas of coral outcrop, was not classified under the



Kapolei Village

DETAILED LAND CLASSIFICATION

Ewa, Oahu, Hawaii



0' 1000'

Figure:

5-6

ALISH system (Figure 5-7). Lands giving the highest yields with the lowest amount of energy input or money with the least amount of damage to the environment are considered to be Prime agricultural lands. Generally, the upper half of the development consists of soils which are rated as "prime" agricultural lands.

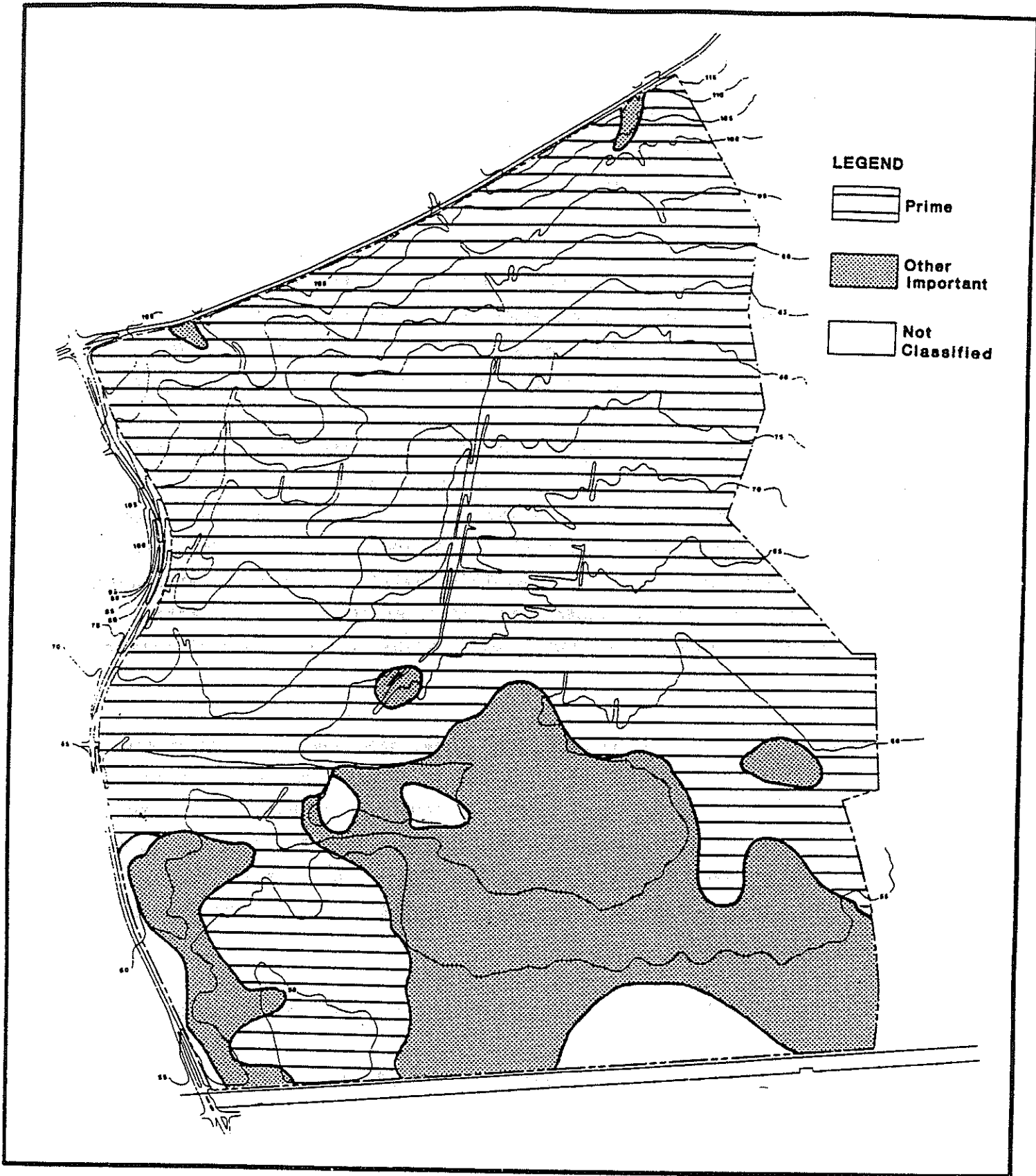
In addition to the soil classifications described above, a more comprehensive and quantitative means for determining viable agricultural lands of Hawaii is the Land Evaluation and Site Assessment (LESA). The LESA system was designed to identify important agricultural lands (IAL).

The Land Evaluation (LE) portion of the LESA system is a quantitative rating of the physical characteristics (including irrigation) of the soil resources of Hawaii. The LE ratings are a composite of the three previously discussed soil classification systems. The Site Assessment (SA) factors or criteria express the relative quality of a site or area based upon its non-physical characteristics or attributes. The SA factors are criteria which indicate the agricultural viability of a parcel, site of area.

To date, only the LE ratings methodology has been developed and applied to the land area in the State. To meet the projected agricultural production goals for Oahu for the year 1995 (approximately 57,661 acres), the application of the LE methodology has resulted in a threshold or "cutoff" value of 66 on Oahu (on a rating scale of 12 to 100). Thus, soils with a LE rating of 66 or greater are among the best soils on Oahu from an agronomic standpoint.

The project site has a range of LE ratings from 12 to 93, as follows:

<u>Soil Type</u>	<u>Acreage</u>	<u>LE Rating</u>
HxA	96	87
HxB	17	85



Kapolei Village
**AGRICULTURAL LANDS OF IMPORTANCE
 TO THE STATE OF HAWAII**
 Ewa, Oahu, Hawaii

0' 1000'

Figure:
5-7

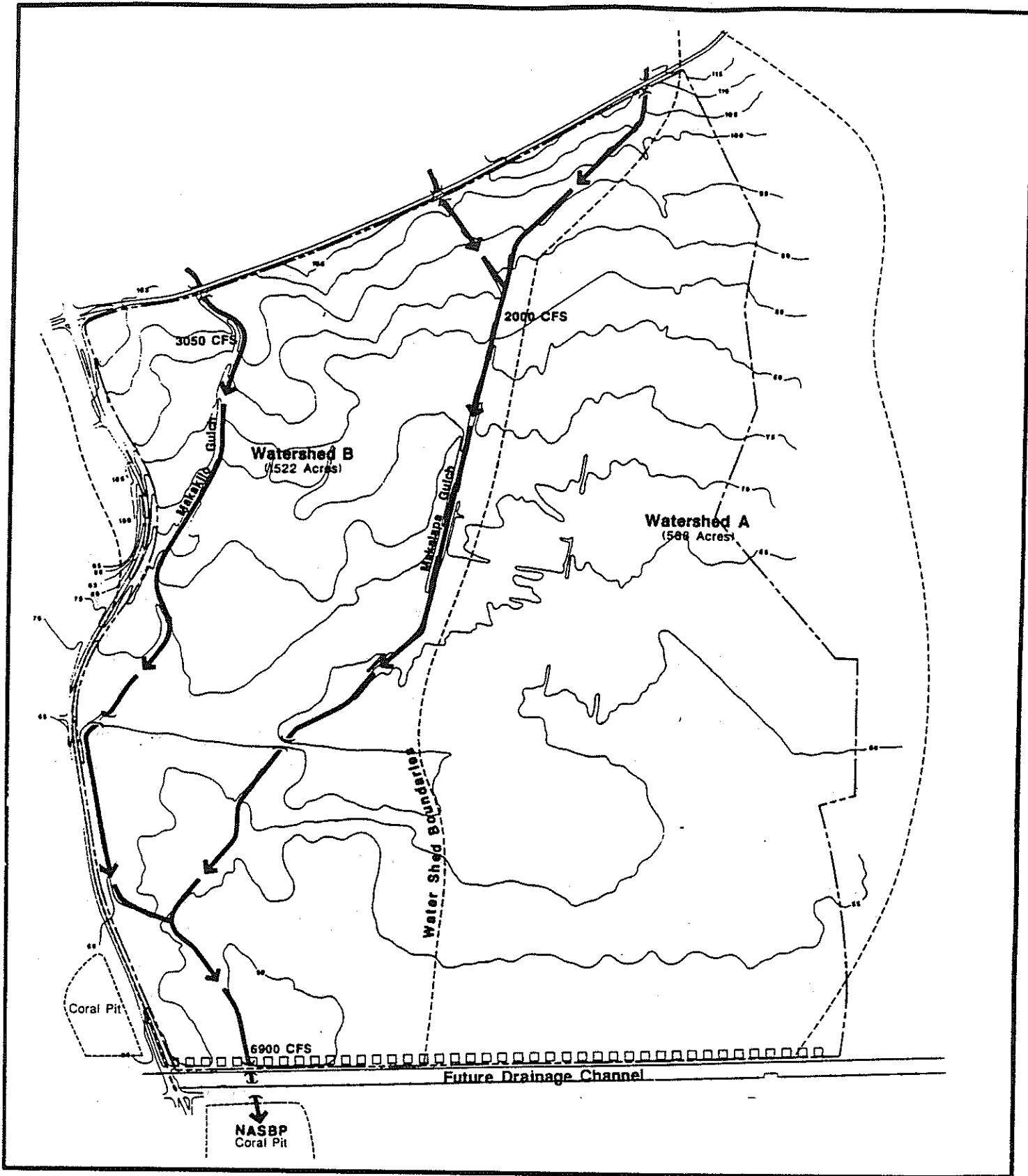
EwA	11	84
EmA	61	74
EaB	22	85
WkA	360	93
WzA	15	92
WIB	3	83
MuC	7	81
MnC	210	66
K1aB	1	83
CR	47	12

The average LE rating for the entire property is 78.5.

5.6 HYDROLOGY

The project site lies within two watersheds (Figure 5-8). Watershed "A" contains no defined waterways, allowing storm runoff to sheetflow over canefield land. Watershed "B" includes two small intermittent streams, Makalapa and Makakilo Gulches, comprising the only two waterways transversing the project site. Makakilo Gulch enters the site with a volume of approximately 3,050 cubic feet per second. Makalapa Gulch has a comparable volume of 2,000 cfs. Total cumulative volumes at the southern boundary are estimated at 6,900 cfs.

Disposal of storm runoff is generally accomplished through infiltration in ground depressions in lower cane regions, with excess runoff overflowing into portions of NAS BARPT. Disposal of storm runoff from the western portion of the project site is accomplished primarily through surcharging of the coral pit located just within the northern boundary of NAS BARPT. A culvert structure at the southern boundary of the project site limits flows into the pit to 1,600 cfs. In the past, debris has restricted passage through this culvert and resulted in flooding of the area-immediately north of the culvert.



Kapolei Village
HYDROLOGY
 Ewa, Oahu, Hawaii



0' 1000'

Figure:
 5-8

The NAS BARPT coral pit is approximately 45 feet deep and consists of porous sand/coral, heavily overgrown with keawe and haole-koa trees. The pit has a storage capacity of about 774 acre-feet and has enough runoff retaining capacity for a 25-year storm (assuming developed conditions). Sheetflows, resulting from stream channel overflow, pond for eventual infiltration in shallow ground depressions just above NAS BARPT.

5.7 FLORA AND FAUNA

This section provides a summary of findings of the biological survey of the project site. The analysis, conducted by Char & Associates, Botanical/Environmental Consultants is presented in the Appendix section of this report. Findings of the analysis are summarized below.

A. Flora

Canefields cover most of the project area. Weedy species which are found associated with these cultivated fields include nutgrass (Cyperus rotundus), swollen fingergrass (Chloris inflata), red pualele (Emilia fosbergii), sowthistle (Sonchus oleraceus), and hairy spurge (Euphorbia hirta). Locally common along the margins of the fields are two vines, wild bitter melon (Momordica charantia var. pavel) and little bell (Ipomoea triloba).

Drainage areas support a dense growth of California grass (Brachiaria mutica), two Panicum species, and Natal redtop (Rhynchelytrum repens). Scattered clumps of castor bean (Ricinus communis) and koa haole (Leucaena leucocephala) shrubs are also frequently encountered.

The spiny fruited puncture vine (Tribulus terrestris) is locally abundant on some of the canehaul roads.

Roadside vegetation occurring within the area is composed mostly of a mixture of grass, small shrub, and herbaceous species. The most abundant element in this vegetation type is buffelgrass

(Cenchrus ciliaris). Also abundant is pitted beardgrass (Andropogon pertusus). Other grasses occasionally found here include Bermuda grass (Panicum maximum), and sourgrass (Tricachne insularis). Among the small shrubs and weedy annual species, the following are frequently encountered: spiny amaranth (Amaranthus spinosus), several weedy Euphorbia species, golden crown-beard (Verbesina encelioides), coat buttons (Tridax procumbens), partridge pea (Cassia lechenaultiana), indigo (Indigofera suffruticosa), 'uhaloa (Waltheria indica var. americana), and 'ilima (Sida fallax).

Kiawe - koa haole thicket vegetation consists of very scattered kiawe trees (Prosopis pallida) with a rather dense cover of koa haole shrubs (Leucaena leucocephala) filling in the matrix between the trees. Buffelgrass (Cenchrus ciliaris) forms a more or less dense ground cover. A number of sisal plants (Agave sisalana) are found in this vegetation type. Sisal was grown on the Ewa Plains from 1893 to the 1920's to provide material for sisal or marine rope and sisal twine.

The OR&L (Oahu Railway and Land Company) right-of-way, with rail bed and tracks, runs along the length of this vegetation type.

B. Fauna

Over the three types of vegetation, a total of ten bird species was recorded. Due to the highly disturbed nature of the vegetation, all but one of the bird species observed were introduced (or foreign) ones. The sole native species, the Pacific Golden Plover (Pluvialis dominica), is a wide ranging migratory species. The nine introduced species were the Cattle Eret (Bulbulcus ibis), Spotted Dove (Streptopelia chinensis), Zebra Dove (Geopelia striata), Black-rumped Waxbill (Estrilda troglodytes), Chestnut Mannikin (Lonchura malacca), Northern Cardinal (Cardinalis cardinalis), Red Avadavat (Amandava

amandava), Red-vented Bulbil (Pycnonotus cafer), and Common Myna (Acridotheres tristis).

No mammals were actually observed on the site, but tracks of the Indian Mongoose (Herpestes auropunctatus) were found along the edge of the canefields.

A number of other bird and mammal species are also likely to use the study site, or at least pass through on occasion. The Mockingbird (Mimus polyglottos), reported from the Barbers Point Deep-Draft Harbor site (M&E Pacific, 1978) and Campbell Industrial Park (Belt, Collins & Associates, 1980), can be expected to utilize the study area to some degree. Four other bird species which are common in the thickets in adjacent parcels are the Red-crested Cardinal (Paroaria coronata), House Finch (Carpodacus mexicanus), House Sparrow (Passer domesticus), and the Japanese White-eye (Zosterops japonica). Another bird, the Nutmeg Mannikin (Lonchura punctulata), is commonly seen in adjacent areas feeding in overgrown grassy areas and can be expected to utilize the study site.

Other mammal species which are likely to be found on the study site but were not observed during this survey include the Roof Rat (Rattus rattus), the Norway Rat (Rattus norvegicus), the Polynesian Rat (Rattus exulans), the House Mouse (Mus musculus), and possibly, also feral dogs (Canis familiaris) and feral cats (Felis catus).

No terrestrial reptiles or amphibians were noted during the study. The Hawaiian Islands do not have any native amphibians or terrestrial reptiles. It is likely, however, that introduced gecko and skink species, such as the Mourning Gecko (Lepidodactylus lugubris), occur on the project site in those areas with shrubs and trees.

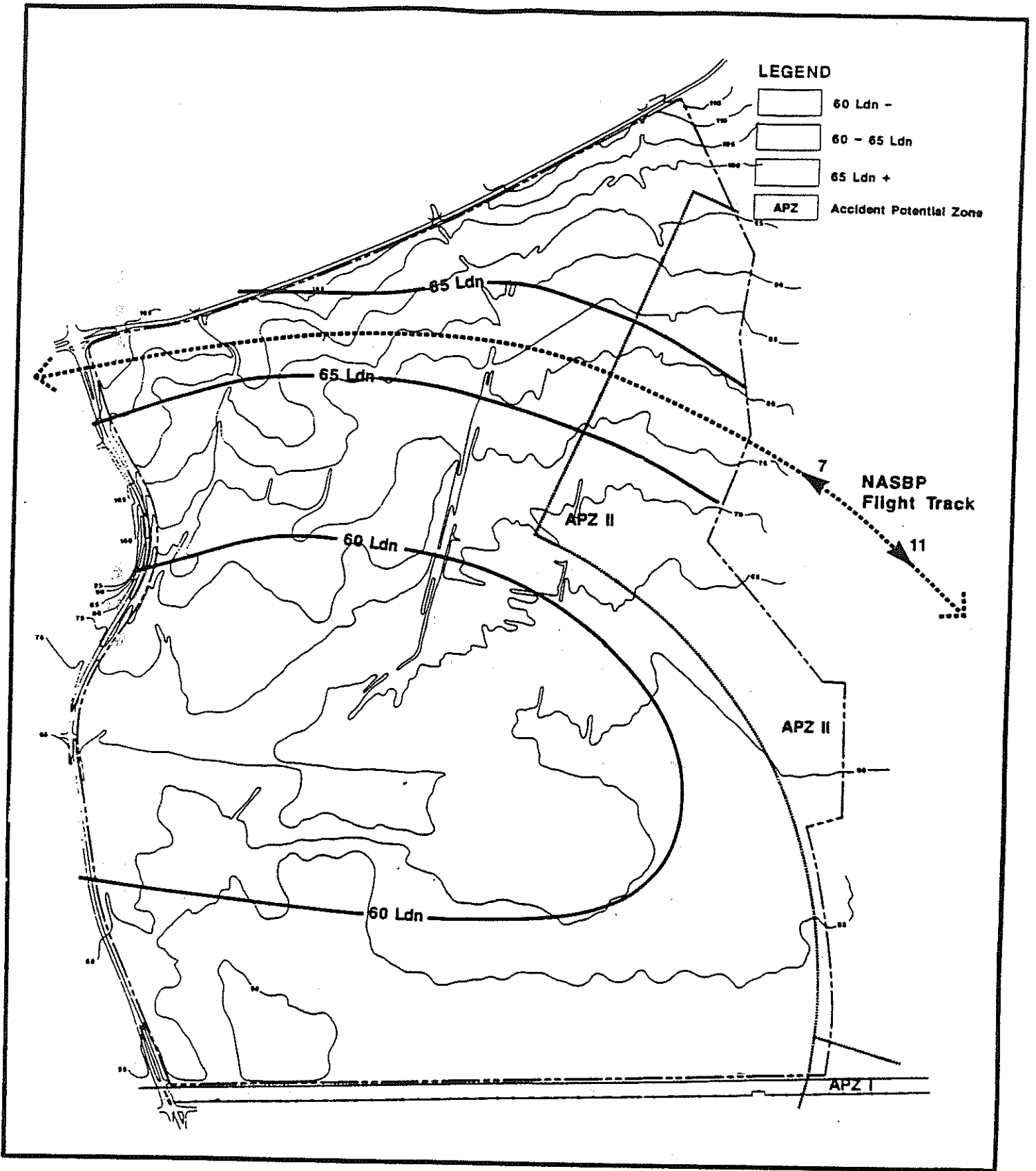
5.8 NOISE

Existing noise levels in the vicinity of the project area are mostly generated from NAS BARPT operations and sugarcane cultivation activities. Noise impacts of aircraft operations from NAS BARPT on the project area and surrounding environment have been the subject of a number of studies.

The U.S. Navy has prepared an Air Installations Compatible Use Zone (AICUZ) Study (1984) which established off-station contours and safety zones (Figure 5-9). The AICUZ identifies significant noise impacts to the project site. A "noise arm" of 65 Ldn and above crosses the top portion of the site following Flight Tracks 7/11. Approximately 11 percent of the site lies within the 65 Ldn+ Zone. Another 56 percent lies within the 60 Ldn to 65 Ldn contours with the balance of 33 percent lying within an area below 60 Ldn.

Accident Potential Zones (APZ) are areas under aircraft flight paths which have a higher than normal potential for aircraft accidents. The three zones of accident potential used in the NAS BARPT AICUZ are described as follows:

- A. Clear Zone - The first 3,000 feet of the trapezoidal approach/departure zone at each end of the runway. The clear zone represents the area of highest potential hazards due to accident and most land uses are precluded in this area.
- B. APZ I - A 5,000-foot long by 3,000-foot wide zone beyond the clear zone. APZ I defines a zone of lesser hazard potential than the clear zone, and some degree of density restrictions are required. All forms of residential use are considered incompatible.



Kapolei Village
U.S. NAVY AICUZ
 Ewa, Oahu, Hawaii



Figure:
 5-9

- C. APZ II - A 7,000-foot long by 3,000-foot wide zone beyond the APZ I. APZ II encompasses areas less hazardous than the APZ I, but still possessing a level of risk sufficient to require density and use restrictions. Most forms of open space, industrial, commercial, and scattered low density residential uses are compatible, whereas medium and high density residential developments and public facilities (schools, churches, etc.) are not. Additionally, structures in this area should not reflect glare, emit electronic interference, or produce smoke.

Approximately 108 acres of the site were identified to lie within APZ II. An additional one-third acre of the site at the extreme southeast corner lies within the APZ I zone. None of the site lies within the clear zone.

Subsequent studies done by the Estate of James Campbell and the HFDC have questioned many of the findings of the U.S. Navy AICUZ report. Principal concerns relate to the magnitude and extent of off-station noise and safety zones. Concerns of aircraft noise impacts are further expressed in Appendix A of this report.

Along existing canehaul roads, which traverse across the project site, canehaul trucks are the dominant source of noise during the harvesting season which occurs every 2.5 years. During the peak harvesting day of 24-hour operation, canehaul truck noise levels could exceed acceptable levels. However, studies conducted for other sugarcane fields in the Ewa Plains area indicate average Ldn values for a harvest season do not exceed moderate levels.

5.9 AIR QUALITY

Since the early 1970's the State's air quality standards have been substantially more stringent than their Federal counterparts and were absolute values not to be exceeded. In 1986, the Department of Health

amended these standards making total suspended particulates (TSP) and sulfur dioxide (SO₂) values the same as the Federal standards and permitting one exceedance per year. Primary standards are intended to protect public health with an adequate margin of safety while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, man-made materials, animals, visibility, climate and economic values.

The existing conditions in the vicinity of the project site are such that there are no impacts to public health because the area is not populated. The principal air pollution source in the area is cane burning. Cane fires result in the emission of particulates, carbon monoxide, and trace amount of other organics. Until urbanization entirely replaces sugarcane cultivation in the Ewa District, there will be some human exposures and complaints about cane fire smoke.

The James Campbell Industrial Park also affects air quality in the project area. However, neither monitoring nor computer modeling show violations of the current standards ("Air Quality Impact Report, Secondary Urban Center" 1987).

5.10 SCENIC AND VISUAL RESOURCES

The predominant view from the site is of the Waianae Mountain Range located approximately three miles to the north. Visible peak height (Palehua) is approximately 3,100 feet MSL. Other views include the primary urban center with Diamond Head visible approximately 25 miles to the east; the Pacific Ocean offlying NAS BARPT, two miles to the south; and of Puu Kapolei (peak height 166 feet MSL) directly to the west.

5.11 HISTORIC AND ARCHAEOLOGICAL RESOURCES

This section provides a summary of findings of historic and archaeological resources of the project site. The analysis, conducted by Paul H.

Rosendahl, Ph.D., Inc., Consulting Archaeologist, is presented in the Appendix section of this report. The analysis is summarized below:

"Although no archaeological remains are known to exist within the project area, one previously identified site and a second reported site are immediately adjacent to it. The Oahu Railroad Company and land company right-of-way (railroad bed), which bounds the project area on the southeast side, is listed on the National Register of Historic Places (Site 50-80-12-9714). A heiau and large rock shelter were reported by J.G. McAllister (1933:108) to have once been located on Puu Kapolei, a volcanic cone situated southwest of and immediately adjacent to the project area; however, this site (Site 138) evidently had been destroyed prior to McAllister's 1930 survey field work. (For a compilation of available traditional information concerning Puu Kapolei and the Honouliuli lands of the Ewa Plain, see Sterling and Summers 1978:31-41)."

"No potentially significant archaeological sites or features of any kind were encountered during the reconnaissance survey of the Kapolei Village project area. Based on the entirely negative results of the reconnaissance survey, it is concluded that no further archaeological work of any kind is necessary, and it is recommended that full archaeological work clearance for the project area be granted. This recommendation is made on the basis of the survey reconnaissance survey field work, and is given with the general qualification that during any development activity involving the extensive modification of the land surface there is always the possibility, however, remote, that previously unknown or unexpected subsurface cultural features or deposits might be encountered. In such a situation, immediate archaeological consultation should be sought."

SECTION 6

ASSESSMENT OF EXISTING CONDITIONS: SOCIO-ECONOMIC ENVIRONMENT

SECTION 6
ASSESSMENT OF EXISTING CONDITIONS:
SOCIO-ECONOMIC ENVIRONMENT

6.1 POPULATION

6.1.1 Existing Conditions

According to the decennial census conducted in 1980, the Ewa Development Plan area's (Census Tracts 83-86.02) population of 36,234 constituted 4.7 percent of the island's total population. Department of General Planning statistics for the area show an increase in the total population in 1985 to 37,300.

Existing population centers in the Ewa area include: Barbers Point Naval Air Station (NAS BARPT), located south of the project site (1985 population: 2,924); Ewa Beach, located between Pearl Harbor and NAS BARPT (1985 population: 14,500); Honokai Hale/Nanakai Gardens, located west of the project site (1985 population: 1,989); Makakilo, located on the lower slopes off the Waianae Range, north of the project site (1985 population: 8,992); and the Ewa Villages, located east of the project site (1985 population: 3,000).

Demographic characteristics of the Ewa Development Plan area, as compared with Oahu, as a whole, generally reveal a younger population, less college level graduates and slightly different ethnic composition with more Caucasians, Filipinos, and Hawaiians, and less Japanese and Chinese.

Table 6-1 identifies selected demographic characteristics of the Ewa Development Plan area and the City and County of Honolulu taken from 1980.

6.1.2 Future Projections

Population projections made by the Department of General Planning for the Ewa Development Plan area show a great amount of population growth for that area. It is projected that population will more than double from approximately 36,000 in 1980 to 83,000 by the year 2005.

TABLE 6-1

SELECTED DEMOGRAPHIC CHARACTERISTICS

	<u>City & County of Honolulu</u>	<u>Ewa D.P. Area (C.T. 83-86.02)</u>
TOTAL POPULATION	762,545	36,234
ETHNICITY	(percent)	(percent)
Caucasion	41.2	44.5
Japanese	24.9	8.8
Chinese	6.9	2.0
Filipino	12.6	24.8
Hawaiian	10.5	12.4
Other	5.5	7.5
AGE		
Less Than 5 Year	7.9	10.7
5-17 Years	20.2	27.8
18-64 Years	64.6	58.6
65 or More Year	7.3	3.0
Median Age (Year)	28.1	N/A
PLACE OF BIRTH		
Hawaii	55.1	49.6
Other U.S.**	30.1	36.1
Foreign County	14.8	14.5
RESIDENT 5 YEARS PREVIOUS*		
(People Aged 5+ Years)		
Same House	48.2	44.0
Same Island	25.5	23.6
Different Island	1.3	0.8
Different State	18.4	26.1
Different Country	6.6	6.1
EDUCATION		
(People Aged 25+ Years)		
0-8 Years Only	14.4	14.3
High School Only	35.5	43.0
College, 4+ Years	21.7	12.4

NOTES: * Except for Total Population and Age, all figures based on 15 percent sample.

 ** Including persons born in U.S. territories, and abroad or at sea to American parents.

SOURCE: Community Resources, Inc., 1986.

6.2 ECONOMY/EMPLOYMENT

6.2.1 Existing Conditions

Employment statistics (1980) within the Ewa Development Plan area reveal a relatively high proportion of the labor force employed in the armed forces. Pearl Harbor and NAS BARPT employ 18 percent of the area's labor force compared with only 10 percent island wide. Table 6-2 provides labor force comparisons between the Ewa Development Plan area and Oahu as a whole.

Unemployment levels of the Ewa area in 1980 were nearly double the general population levels (8 percent versus 4.6 percent). Occupational profiles of the Ewa labor force reveal a large number of blue collar occupations (service, farm, precision, craft, repair, laborers, etc.) with few white collar occupations. The occupation profile is largely reflected by agricultural jobs within the Ewa area being three times as high as the general population.

6.2.2 Future Projections

Employment projections for the Ewa Development Plan area indicate that the Ewa area will become a major employment center upon completion of the Secondary Urban Center. Areas of concentrated employment opportunities include the James Campbell Industrial Park, the Ko'Olina Resort and the proposed Kapolei Town Center located immediately west of the proposed Kapolei Village site.

6.3 HOUSING

6.3.1 Existing Conditions

In 1985, the Department of General Planning estimated that the Ewa Development Plan area contained a total of 9,300 housing units, comprising approximately 3.5 percent of the total housing stock on Oahu.

Existing residential communities in the Ewa area consist of: Barbers Point, Naval Air Station (NAS BARPT), located south of the project site (1985 housing units: 850); Ewa Beach, located between Pearl Harbor and NAS BARPT (1985 housing units: 3,465); Honokai Hale/Nanakai Gardens, located

TABLE 6-2

LABOR FORCE SIZE AND CHARACTERISTICS
(1980)

	<u>City & County of Honolulu</u>	<u>Ewa D.P. Area (C.T. 83-86.02)</u>
POTENTIAL LABOR FORCE		
(Aged 16+/-)	574,903	23,862
not in labor force	30.8%	31.9%
armed forces	10.1	18.5
civil. labor force	59.1	49.5
CIVILIAN LABOR FORCE	339,863	11,821
unemployed	4.6%	8.0%
TOTAL EMPLOYED CIVIL. LABOR FORCE	324,113	10,873
OCCUPATION		
service	17.6%	19.5%
manager/professional	24.7	14.2
technical, sales & admin.	33.8	31.0
farm/fish/forest	1.8	3.9
precision, craft, repair	11.3	15.5
operators, fabricators, laborers	10.9	16.3
INDUSTRY (selected)		
agric., forest, fish, mining	1.7%	6.1%
construction	6.6	7.5
manufacturing	7.7	12.0
retail trade	20.5	20.1
financial, insurance, real estate	8.1	5.2
personal, entertain. & rec. svcs.	8.1	5.9
health, educ., and professional	18.5	12.7
public adminis.	10.9	13.4
COMMUTE TO WORK		
45 minutes or more	12.0	22.6
mean travel (min.)	22.6	25.8

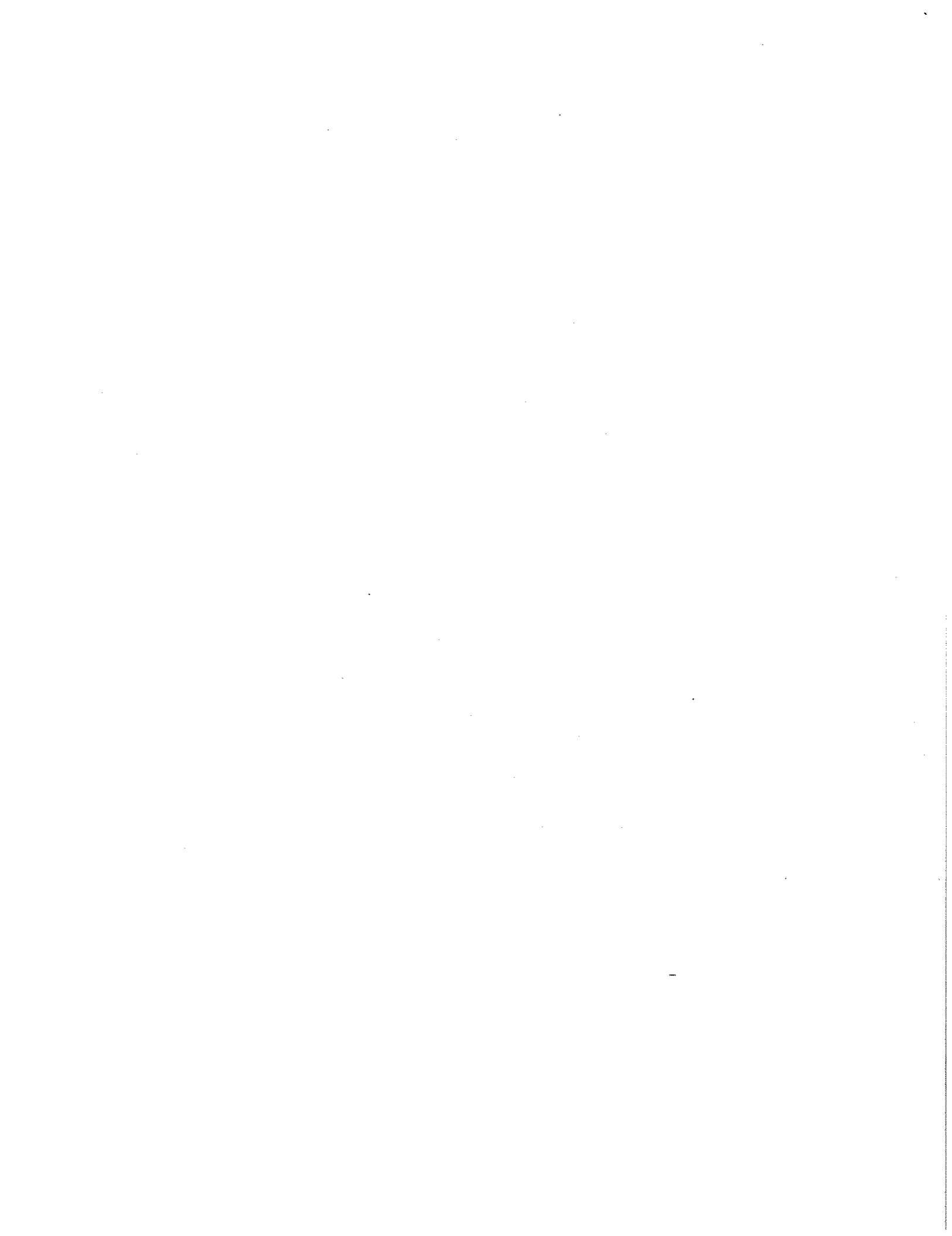
NOTES: All figures based on 15 percent sample; hence, numbers represent estimates.

SOURCE: Community Resources, Inc., 1986.

west of the project site (1985 housing units: 500); Makakilo, located on the lower slopes of the Waianae Range, north of the project site (1985 housing units: 2,700); and the Ewa Village, located east of the project site (1985 housing units: 900).

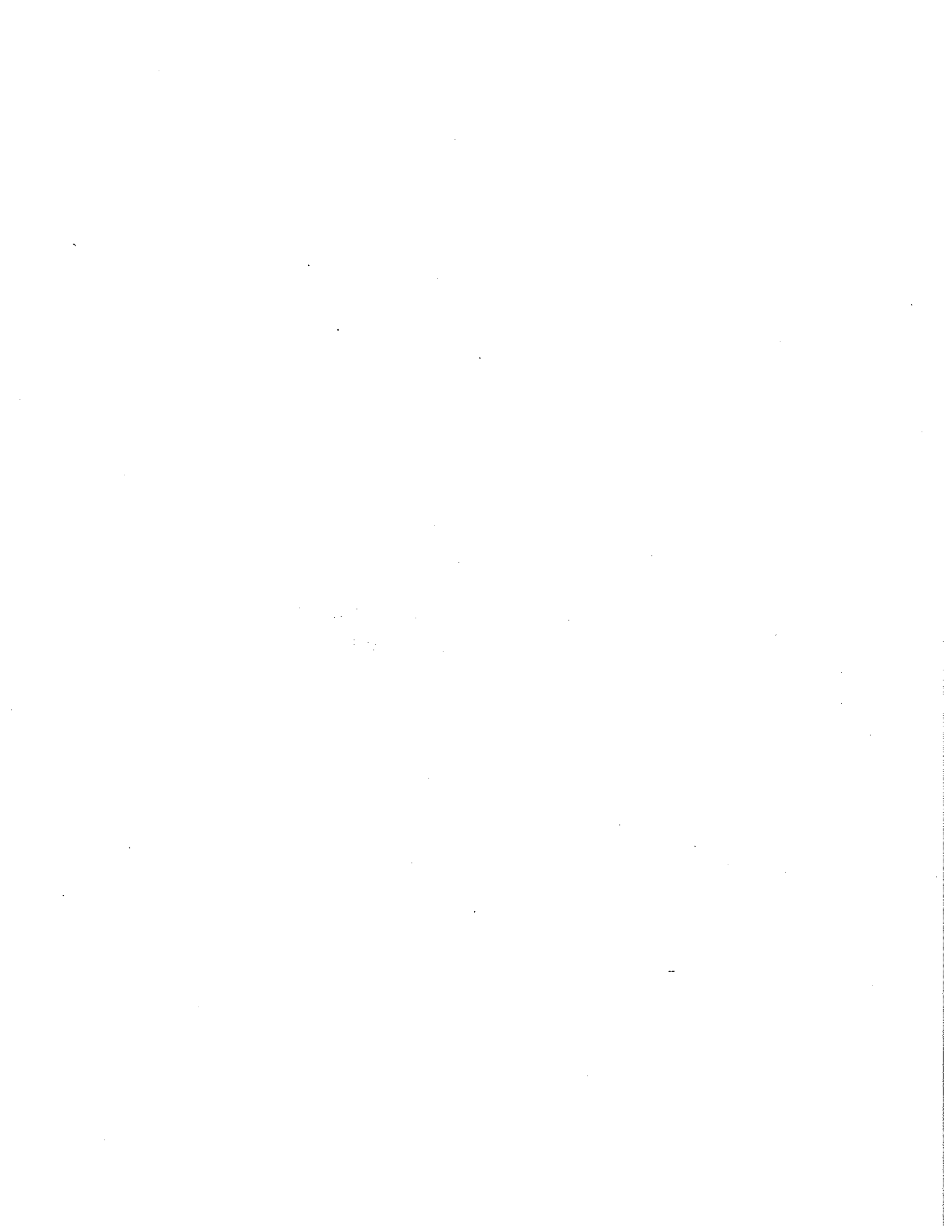
6.3.2 Future Projections

The projected housing demand for Oahu is expected to increase significantly as population, employment and household incomes continue to grow. The Department of Business and Economic Development (DBED) projects the population of Oahu to increase to approximately 954,000 persons by the year 2005. This increase represents the need for an additional 48,000 housing units, assuming a factor of 2.9 persons per household. The greatest demand for additional housing is expected to occur in the Ewa and Central Oahu areas, due to increased employment opportunities in those areas.



SECTION 7

ASSESSMENT OF EXISTING CONDITIONS: PUBLIC FACILITIES AND SERVICES



SECTION 7

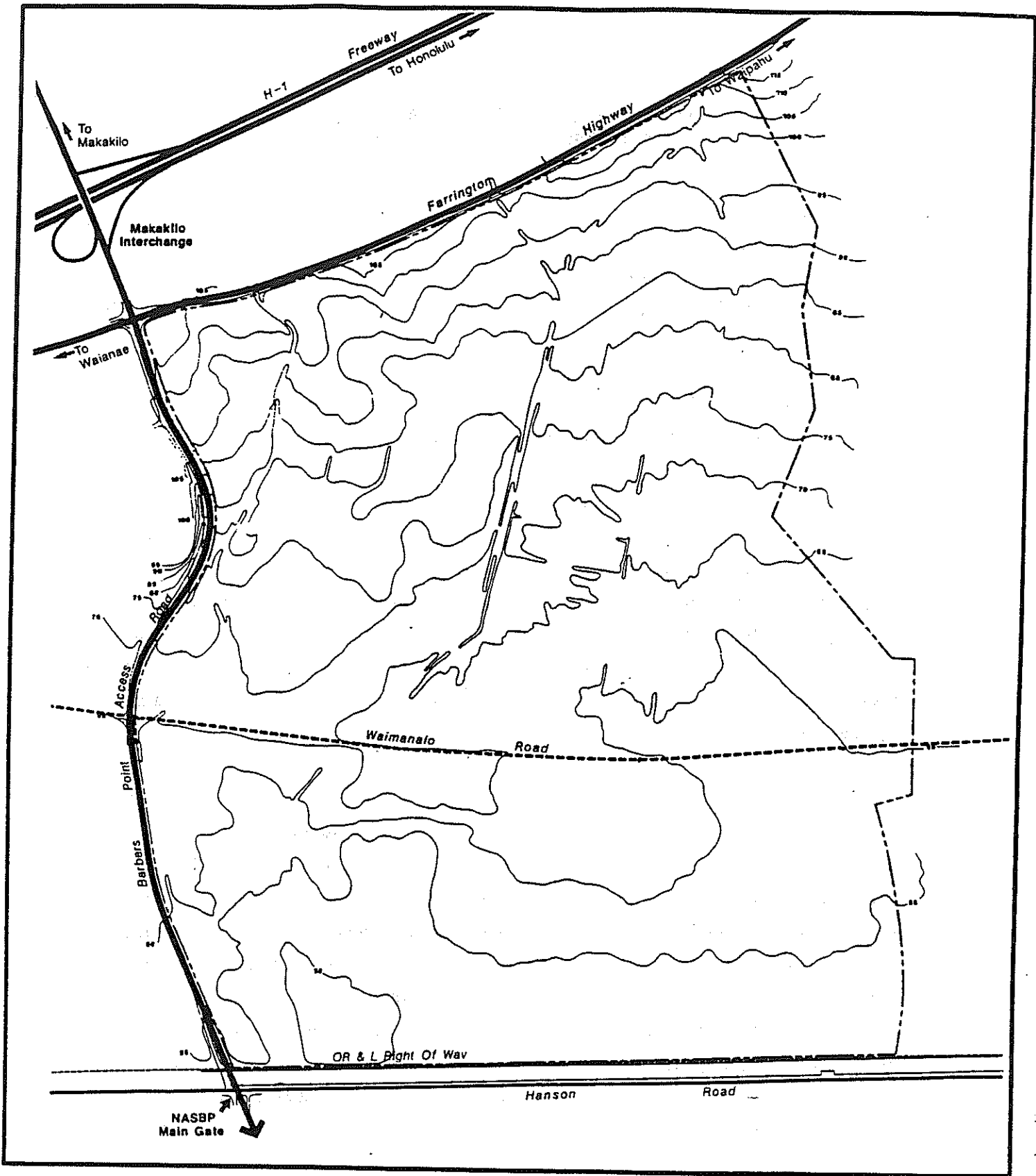
ASSESSMENT OF EXISTING CONDITIONS: PUBLIC FACILITIES AND SERVICES

7.1 TRANSPORTATION

The project site is well served by regional and local road systems (Figure 7-1). Major public roadways adjacent to the site include Farrington Highway, a two-lane highway along the northern boundary and Barbers Point Access Road, a two-lane highway along the western boundary of the site. Further north of the site is the H-1 Freeway allowing access to the site via the Makakilo Interchange. The freeway in the vicinity of the site is presently being upgraded from four lanes to six lanes.

Other roadways located in and around the project site include: Waimanalo Road, a private agricultural road used by the Oahu Sugar Company to transport harvested sugarcane to the mill in Waipahu; the State-owned OR&L ROW, located adjacent to the southern boundary of the project site, extending from Pearl Harbor to the Ko'Olina Resort; and Hanson Road, paralleling the OR&L ROW inside the NAS BARPT boundary, connecting Geiger Road and Fort Weaver Road, providing military access to the major residential communities of Ewa Beach and Iroquois Point.

Traffic on Farrington Highway, west of Barbers Point Access Road, exhibits directional splits during peak periods typical of suburban commuter routes. The existing two-way peak hour traffic volumes on this portion of Farrington Highway are between 500 and 600 vehicles per hour. East of Barbers Point Access Road, eastbound and westbound traffic are almost evenly distributed. Major employment areas (Campbell Industrial Park and NAS BARPT) attract traffic during the morning which balances eastbound commuter traffic produced in residential areas. Highest hourly traffic on Farrington Highway adjacent to the project site occurs in the afternoon, with a two-way volume of 580 vehicles per hour, or approximately one-third of the highway's capacity.



Kapolei Village
ROADS

Ewa, Oahu, Hawaii



0' 1000'

Figure:
 7-1

Barbers Point Access Road, adjacent to the project site, carries a two-way volume of approximately 1,300 vehicles per hour during the morning peak hour and 1,200 vehicles per hour during the afternoon peak hour. Traffic on Makakilo Drive exhibits the typical pattern of a residential area with high directional splits reflecting home-to-work and work-to-home commuting. The existing two-way peak hour traffic volumes on Makakilo Drive near the H-1 Freeway overpass are approximately 1,300 vehicles per hour during the morning (AM) and afternoon (PM) peak periods.

The signalized intersection of Farrington Highway and Barbers Point Access Road has an estimated total capacity of 2,700 vehicles per hour. At this intersection, the existing counts show the volume to be 1,750 vehicles per hour during both morning and afternoon peak hours.

The H-1 Freeway in the vicinity of the proposed project is presently being upgraded from a four-lane freeway to a six-lane freeway. The on-ramps from Makakilo Drive merge before entering the freeway and presently handle a peak volume of 830 vehicles per hour in the morning during which time the freeway volume is approximately 1,300 vehicles per hour approaching the ramp. Westbound traffic from the freeway using the off-ramp to Makakilo and NAS BARPT is stopped at Makakilo Drive; some delays occur in the morning because of high volumes wishing to turn left towards the air station.

Bus transportation services are supplied by the City and County of Honolulu, Department of Transportation Services (DTS). Bus service operates according to supply and demand, subject to availability of resources. Bus services within the vicinity of the project area are currently supplied to Makakilo, Ewa and Ewa Beach (Route 50 and 51).

7.2 WATER

The project site is located within the Board of Water Supply's (BWS) Ewa-Waianae District. Presently, the site is serviced by an agricultural water system maintained by the Oahu Sugar Company.

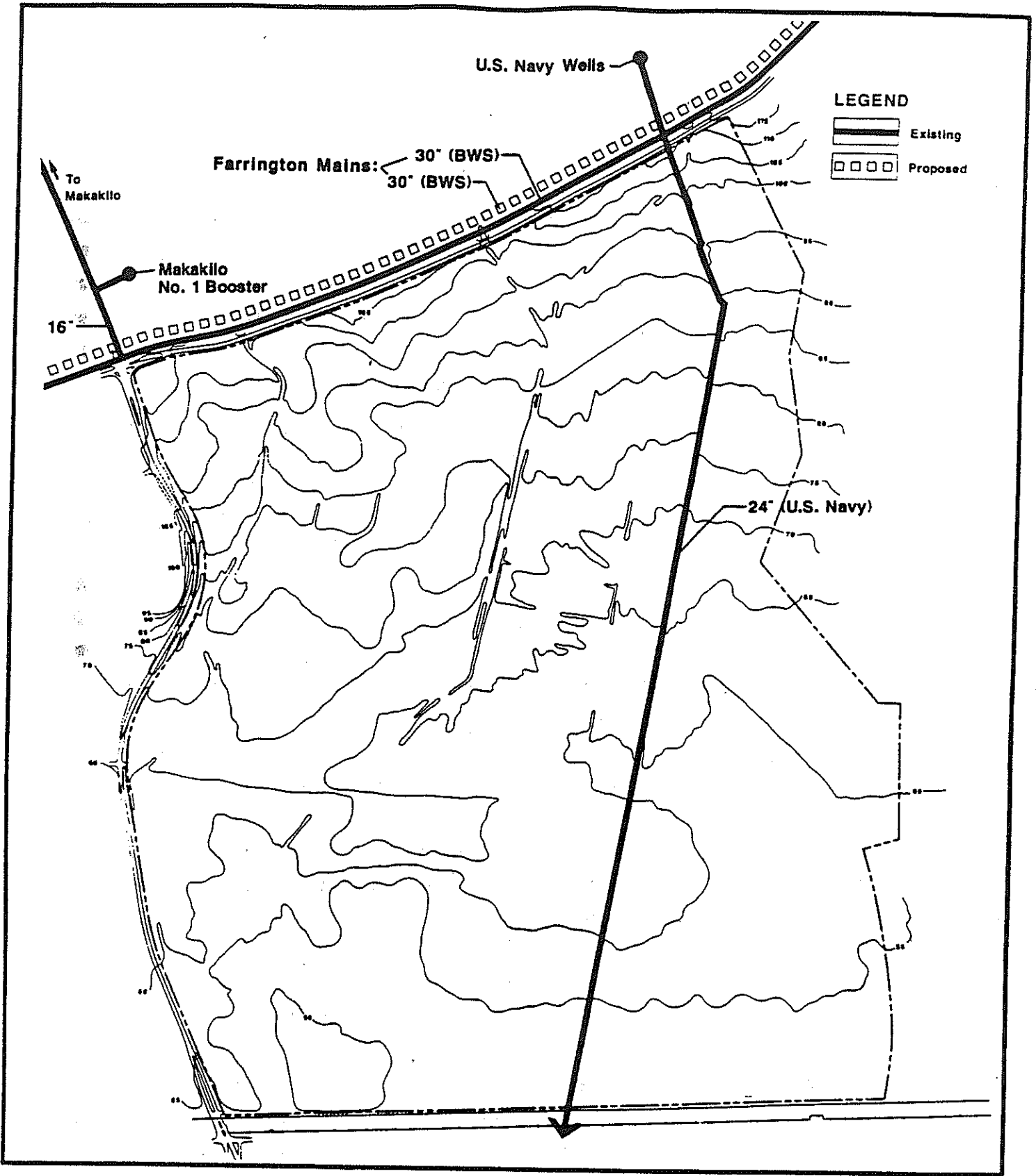
Existing BWS infrastructure in the area (Figure 7-2) includes: a 30-inch water main running along the northern side of Farrington Highway from Waipahu to the 215-foot Barbers Point tank (9 MG total capacity) located approximately 2.5 miles west of the project site; the Makakilo No. 1 Booster, located north of the project site, supplying water to the Makakilo residential community; and a 24-inch water line (withdrawal capacity: 5 MG per day) maintained by the Navy, providing potable water needs of NAS BARPT from Navy wells located north of the project site between Farrington Highway and the H-1 Freeway.

The 30-inch transmission line along Farrington Highway currently provides water to existing developments in the Ewa area as well as the Waianae-Makaha area. Water sources supplying the existing 30-inch main belong to the Board of Water Supply.

The Ewa area lies within the Pearl Harbor Ground Water Control Area. According to the Department of Land and Natural Resources, State of Hawaii, current groundwater pumpage has nearly reached the aquifer's sustainable yield.

To date, the Estate of James Campbell has verbally agreed to provide 175,000 gallons of water per day to the development at no cost. Water from the Board of Water Supply is made available as needed, providing there is a sufficient supply available. Additionally, water may be available from the Estate of James Campbell based on an Ewa (Regional) Water Master Plan. The master plan takes into consideration the development schedules of various projects in the Ewa area with regard to storage, transmission and scheduling of water resources. The cost of implementing this plan will be distributed to the various developments on a per unit or gallon per day (gpd) basis.

Major proposed water facilities in the area include a second 30-inch water main paralleling the existing main along Farrington Highway and additional storage reservoirs located at an approximate elevation of 220 feet above sea level, located north of the H-1 Freeway. Additionally, the 24-inch



Kapolei Village

WATER

Ewa, Oahu, Hawaii



0' 1000'

Figure:

7-2

water line maintained by NAS BARPT, currently running through the project site will need to be relocated.

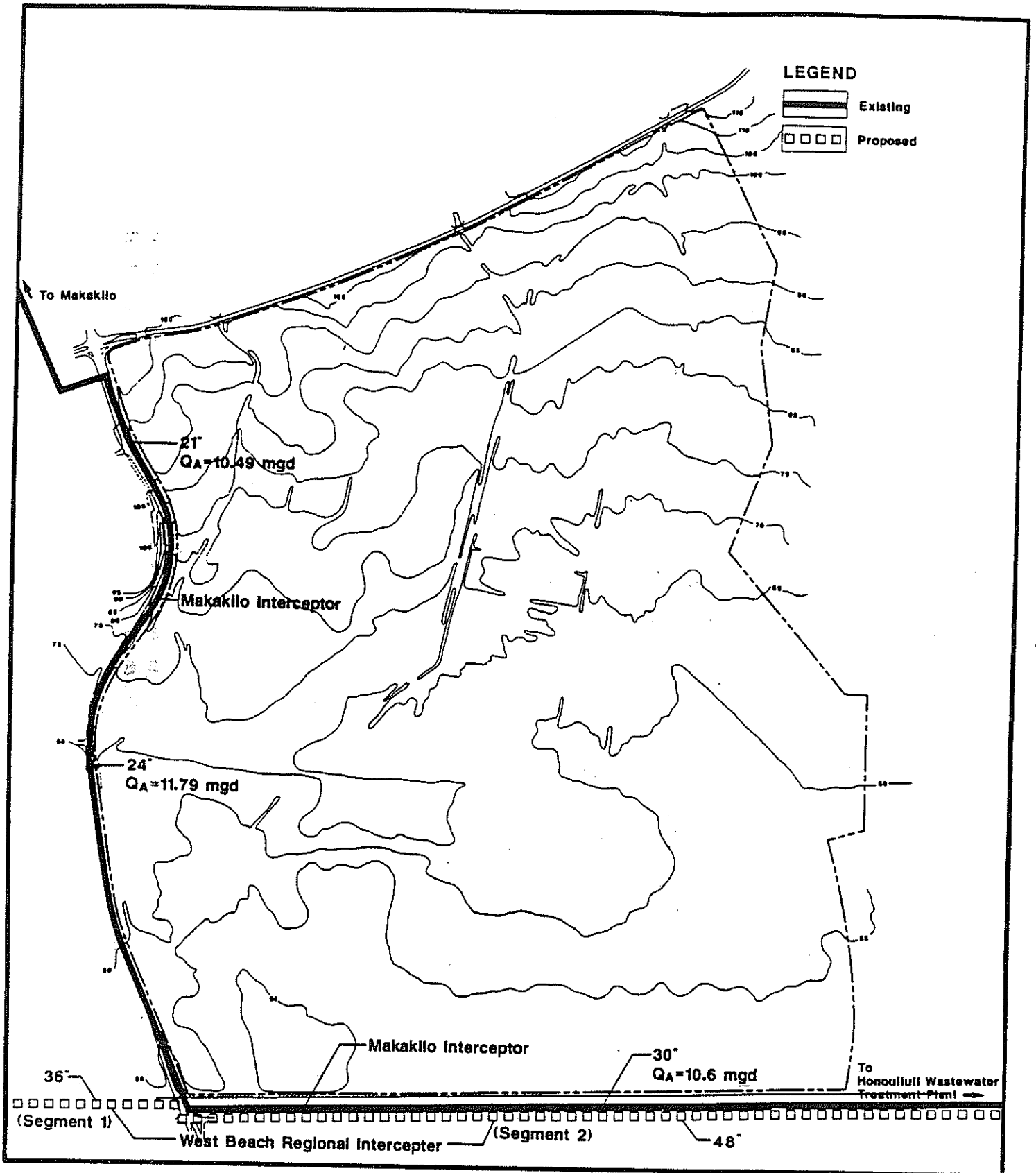
7.3 WASTEWATER

The existing sewerage system includes the Makakilo Sewer Interceptor, the Ko'Olina Interceptor and the Honouliuli Wastewater Treatment Plant (WWTP). The Makakilo Interceptor conveys the sewage produced from the Makakilo development to the Honouliuli WWTP, via Fort Barrette Road and Renton Road. Presently, there is excess capacity in the interceptor. The size of the interceptor varies from 18 inches to 30 inches in diameter. The existing sewerage system is shown on Figure 7-3.

The existing capacity of the Honouliuli WWTP is 25 mgd. The existing flow is approximately 21 mgd. The effluent outfall capacity is 112 mgd. The ultimate capacity of the WWTP is 51 mgd. A planned expansion to 38 mgd is anticipated in 1993.

The Ko'Olina development has plans to construct an interceptor from the Ko'Olina development to the Honouliuli WWTP. The interceptor is to be constructed in two increments. The first increment extends from the Ko'Olina development to the intersection of Fort Barrette Road and Renton Road, where it connects to the existing Makakilo interceptor. The first increment will be upgraded to accommodate flows from the Secondary Urban Center (SUC). First phase development of Kapolei Village and the SUC will be connected to the Makakilo interceptor to take advantage of the unused capacity of the Makakilo interceptor.

The second increment of the interceptor will be an extension of the first increment from Fort Barratte Road to the Honouliuli WWTP. The second increment will be constructed when the capacity of the Makakilo interceptor is reached. Connection between the first increment of the interceptor will be severed and all flows from the first increment will be diverted from the Makakilo interceptor to the new interceptor. The second increment of the interceptor must be upgraded to accommodate flows generated from Kapolei Village.



Kapolei Village
WASTEWATER
 Ewa, Oahu, Hawaii



0' ————— 1000'

Figure:
 7-3

The first increment of the interceptor is to be constructed in the near future and construction of the second increment is anticipated in 1990.

7.4 SOLID WASTE

Solid waste disposal services for residential areas near the project site are currently provided by the City and County of Honolulu, Division of Refuse. Non-residential disposal services are provided by private refuse collection companies. Solid wastes are disposed of either at the Palailai Landfill or the Waipahu Incinerator.

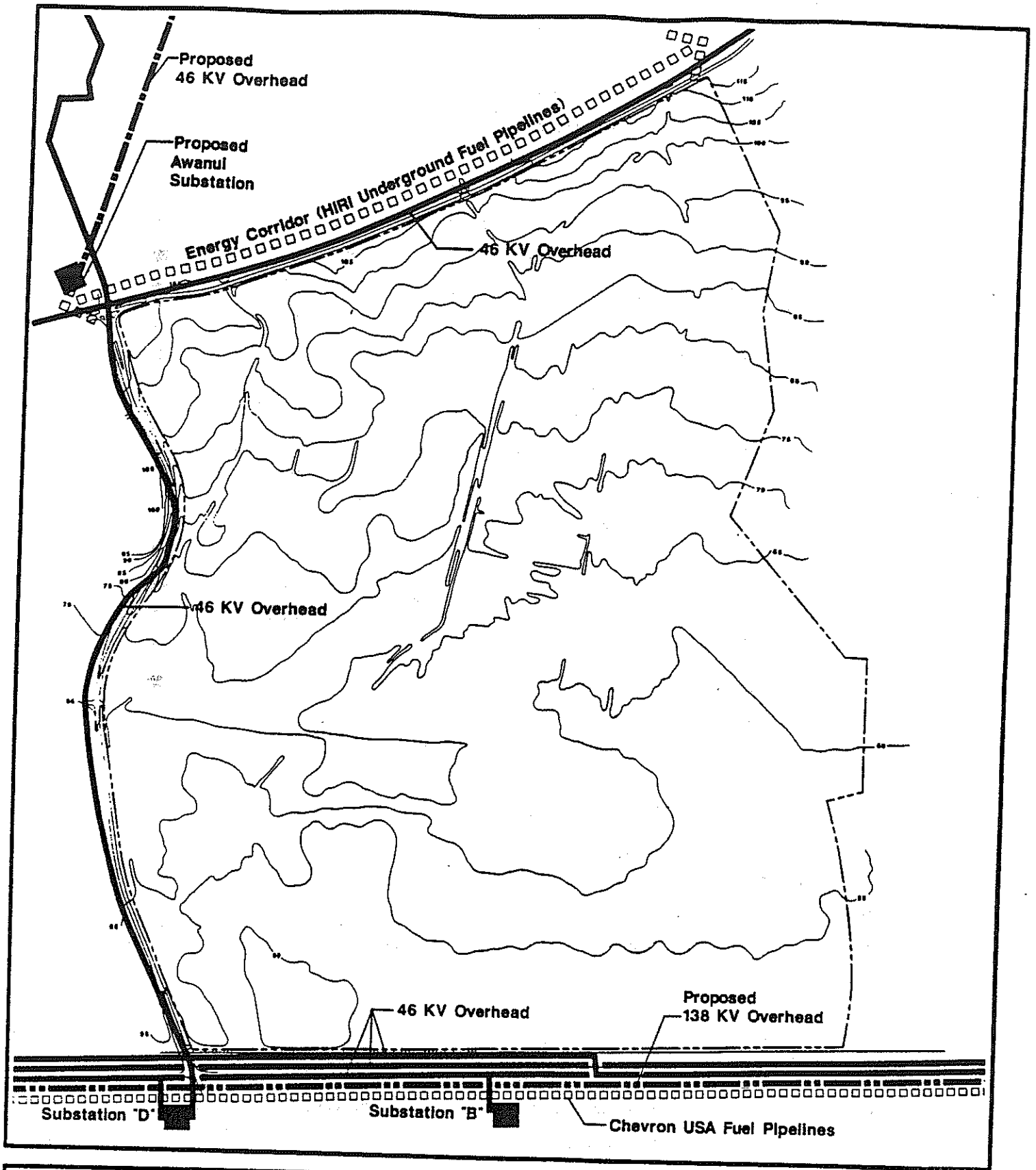
7.5 STORM DRAINAGE

There is no existing drainage system on the project site. Storm runoff from the area above Farrington Highway is presently conveyed through three culverts crossing Farrington Highway to the project site. The runoff passes through the project site via cane field ditches to NAS BARPT. Some of the runoff enters a large coral pit located in NAS BARPT, while some runoff flows through NAS BARPT.

The "Ewa Drainage Study" provides detailed information on the existing drainage conditions and proposed drainage improvements for the Kapolei Village development and the SUC.

7.6 POWER AND COMMUNICATIONS

Electrical power for the project site and vicinity is provided by the Hawaiian Electric Company (HECO). Overhead lines (46 KV) lie within the 100-foot ROW south of the project site paralleling the NAS BARPT boundary. Other 46 KV overhead lines run along Barbers Point Access Road and Farrington Highway. HECO has designated the 100-foot ROW, south of the project site, as a possible corridor for a proposed 138 KV overhead line extending from the Waiuu Power Plant. An alternate corridor for this major transmission facility is located along Farrington Highway. HECO has also proposed a 46 KV overhead line and substation (Awanui Substation) to be sited next to the proposed Makakilo Shopping Center, adjacent to the northwestern corner of the project site (Figure 7-4).



Kapolei Village
POWER

Ewa, Oahu, Hawaii



0' 1000'

Figure:
 7-4

Both Chevron USA and Hawaiian Independent Refineries, Inc., (HIRI) maintain petroleum pipelines in the project area. Chevron USA maintains two petroleum pipelines: an 8-inch "black oil" line along the southern border of the project site, and a "light oil" line along the 40-foot OR&L ROW. HIRI maintains an energy corridor located north of Farrington Highway, extending from their refinery facilities at Barbers Point to the Honolulu International Airport and Downtown Honolulu Terminal facilities.

Hawaiian Telephone Company maintains telecommunications facilities in the project area at Makakilo, NAS BARPT and the Honokai Hale Subdivision. A new switching facility will be required to accommodate additional loads created by Kapolei Village and other proposed developments in the area.

7.7 FIRE AND POLICE SERVICE

Fire services to the project area are provided from the Makakilo Station, which houses an engine company and five firefighters. Additional City Fire Department units are available from the Waipahu and Nanakuli units.

Police service to the Ewa area is provided from the Pearl City Station, which is staffed by 161 police officers. The Pearl City Station patrols three districts: Waianae Coast; Waipahu/Ewa Beach; and Aiea/Pearl City.

7.8 MEDICAL FACILITIES

Health care facilities for the area are provided by the Waipahu Clinic with a staff of 70 doctors, nurses, and aides. The service area for the clinic extends from Waipahu to Waianae offering a variety of health services. The nearest hospital emergency services are provided at the Moanalua Kaiser Medical Center.

7.9 SCHOOLS

Schools within the vicinity of the project area include Barbers Point, Makakilo, Maukalanii, and Ewa Beach Elementary Schools, Ilima Intermediate School, and Campbell High School.

7.10 RECREATION FACILITIES

Existing recreation facilities near the project site include neighborhood parks located in Ewa Beach and Makakilo, beach parks located in Ewa Beach and NAS BARPT, and a golf course located on the eastern border of NAS BARPT. At present, a shortage of recreational facilities exists in the Makakilo area where participants must use Ewa Beach facilities for many sports activities.



SECTION 8

SUMMARY OF IMPACTS AND MITIGATION MEASURES

SECTION 8
SUMMARY OF IMPACTS AND MITIGATION MEASURES

8.1 AGRICULTURAL IMPACTS

Impacts on agriculture were studied by Decision Analysts Hawaii, Inc., in November 1987. A summary of findings is presented below with the complete study presented in Appendix F.

At present, the entire project site is used for sugar cultivation by the Oahu Sugar Company (OSCo). OSCo currently manages approximately 14,200 acres of plantation land covering portions of Central Oahu, north of Pearl Harbor, and portions of the Ewa Plain, west of Pearl Harbor. Nearly all of the plantation land is leased, primarily from the Estate of James Campbell and Robinson Estate. Land leases from the Estate of James Campbell are scheduled to expire in 1995, with leases of the Robinson Estate expiring one year later. Both leases allow for partial withdrawal of lands for urbanization. Development of the project site will result in a decrease of approximately 830 acres of available cane lands.

Loss of agricultural land, in terms of Agricultural Lands of Importance to the State of Hawaii (ALISH), include approximately 591 acres of "Prime" agricultural land and approximately 209 acres of "Other Important" agricultural land. The remaining 30 acres include areas of coral outcrop not classified under the ALISH system.

The development of Kapolei Village would not adversely affect the economic viability of OSCo, nor would it require layoffs of sugar workers. This assumes the continuation of historic development rates for housing projects - rates which would allow sufficient time to increase yields and thereby partially or completely compensate for the reduced acreage with little or no loss in production. Reductions in employment would occur through retirement and voluntary movement to other jobs. Over the long term, OSCo could accommodate a major reduction in acreage and maintain economies of scale by operating just one mill, rather than two in parallel.

volume of runoff equivalent to the additional amount generated as a result of the project. The detained runoff will be released at a controlled rate after the storm subsides. A small culvert at the exit will be able to pass everyday low flows.

Runoff generated off-site will be directed around the development to the NAS BARPT coral pit for disposal by infiltration and evaporation. Estimated peak flow to the coral pit after development is 2,430 cubic feet per second (cfs). The only improvement to the off-site drainage system is upgrading the drainage swale north of Farrington Highway to prevent overflowing onto Farrington Highway during a 100-year storm.

Drainage improvements implemented within the project development, as well as other neighboring developments, will have a positive impact on NAS BARPT since runoff presently sheet flows into the base.

It is anticipated that the constituent quality of runoff from the project site will change. As development occurs, runoff could contain a decrease in nitrogen and suspended solids and an increase in phosphorus.

8.11 SOLID WASTE

Currently, solid waste for the region is disposed of at the Palailai and Waianae Landfills. Both of these landfill sites are expected to close in mid 1988 and are not expected to provide refuse disposal services for the proposed Kapolei Village. However, a new landfill site is currently under construction at Waimanalo Gulch and is expected to open as the other two landfill sites close. Additionally, a Garbage-to-Energy H-POWER facility, located in the James Campbell Industrial Park is scheduled to become operational in late 1990.

8.12 POWER AND COMMUNICATIONS

No adverse impacts resulting from off-site and on-site improvements are anticipated. Proposed off-site power and communication requirements include a telephone switching station to serve the proposed Kapolei Town

Long term impacts to air quality resulting from increased vehicular traffic will be offset to some degree by the automotive industry compliance with EPA emission requirements. Other mitigative measures such as improved road facilities in the vicinity of the project, proposed ride sharing, and reduced travel demands will help mitigate direct impacts from increased carbon monoxide emissions. Other long term impacts include increased sulfur dioxide emission resulting from increased electrical demand.

The types of measures that have been incorporated into the plan to help reduce the predicted adverse air quality impacts include:

- additional highway improvements to increase capacity
- development of a mass transit system
- encouraging car pooling
- establishment of more jobs in Ewa

Additional adverse impacts on air quality will result from cane burning operations of nearby sugarcane fields. With phased development of the proposed project, a growing number of residents will be affected by the air pollution from cane fires. The impact on air quality from cane fires is expected to last until termination of sugarcane cultivation in the project vicinity. As an interim measure, prospective residents of the development will be advised of this potential health hazard.

8.3 TRAFFIC CONDITIONS

The following is a summary of Appendix B, Traffic Impact Study conducted by Parsons, Brinckerhoff, Quade and Douglas, Inc. Traffic impacts are projected at full project development.

The proposed project will increase traffic on the existing and proposed roadways in the area of the project. Projected traffic volumes for intersections resulting from development of Kapolei Village include the following:

<u>Signalized Intersection</u>	PEAK HOUR	
	A.M. (vph)	P.M. (vph)
Barbers Point/Farrington	1386	1266
Barbers Point/Road "A"	1150	1199
Barbers Point/Ewa Parkway	1129	1302
Ewa Parkway/West Loop	1100	1234
Ewa Parkway/East Loop	1357	1283
Farrington/Village Parkway	1585	1238
Village Parkway/Loop Road	1595	1349
West Loop/Road "A"	920	774

NOTES: vph - vehicles per hour
 0-1200 = under capacity
 1201-1400 = near capacity
 greater than 1400 = over capacity

The Kapolei Village Master Plan proposes signalization at the following intersections: Barbers Point Access Road/Road "A," Barbers Point Access Road/Ewa Parkway and Farrington Highway/Village Parkway. Signalization of the major intersections of Ewa Parkway/West Loop Road, Ewa Parkway/East Loop Road, East (West) Loop Road/Village Parkway and West Loop Road/Road "A" would also be justified at full development using the Manual of Uniform Traffic Control Devices Warrant 11 for peak hour volumes.

The following recommendations apply to the roadway system for Kapolei Village.

- A. Provisions for traffic signals should be included during construction at the following intersections: Village Parkway/East (West) Road, West Loop Road/Ewa Parkway, East Loop Road/Ewa Parkway and West Loop Road/Road "A." Traffic volumes at these intersections need to be monitored and signalization should be provided when necessary and warranted.
- B. Farrington Highway should be widened to include two lanes in each direction from Barbers Point Access Road to the Access 1 intersection.

- C. The Farrington Highway approach for Access 1 should include a deceleration lane for right turns and a left turn lane for turns onto the Access Road. Separate lanes for left and right turns should be provided from the Access Road.

Regional recommendations for traffic mitigation include the following:

- A. The intersection of the west bound off-ramp from H-1 Freeway with Makakilo Drive should be signalized. The off-ramp approach should be widened to include two left turn lanes for southbound traffic and a right turn lane for northbound traffic. Makakilo Drive should be restriped to include four through lanes on the south bound approach and two through lanes on the north bound approach of this intersection. Analysis of this signalized intersection shows that it will be near capacity during the A.M. peak hour and under capacity during the P.M. peak hour.
- B. The east bound on-ramp for traffic from the south should be extended to enter the freeway separately from the east bound loop on-ramp from the north.
- C. The High Occupancy Vehicle (HOV) designation of the center lanes on the H-1 Freeway should be reviewed; west bound traffic volumes in the A.M. peak period and east bound volumes in the P.M. peak period would each require three lanes. Improved access to the HOV lane from the local streets should be considered in view of the high traffic volumes on the freeway.

Additionally, a proposed rapid transit system is currently being planned to extend as far as the Waiawa Interchange between H-1 and H-2. If the proposed system is built, a major train and bus terminal, along with park-and-ride facilities could be built at the Ewa Navy Drum Storage Area site. From there, frequent feeder

bus service could be provided to Kapolei Village. Also under consideration is the possibility of extending the guideway to Kapolei Village when population growth warrants.

8.4 SOCIO-ECONOMIC IMPACTS

The Ewa Development Plan area is planned to undergo a rapid growth cycle over the next twenty-year period as it becomes Oahu's Secondary Urban Center. City and County of Honolulu population projections indicate the Ewa Development Plan Area population is expected to increase from approximately 36,000 in 1980 to 83,000 by the year 2005.

New housing development at the project site will add to the population of the Ewa development plan area. Estimating the size of project population depends upon assumptions about the average household size of future residents.

For single-family housing, the Department of General Planning assumes 3.3 persons per unit in assessing population impacts. This figure may be somewhat high, as household sizes in Ewa and Central Oahu, as reported by developers, tend to show smaller families. At Mililani, 3.03 persons per unit were reported for single-family homes priced between \$115,000 to \$164,000 (John Child & Co., 1987). Therefore, the population impact is calculated using 3.0 persons per unit as the lower range of single-family units and 3.3 persons per unit as the upper range.

Utilizing these averages and a maximum 5,000 units for Kapolei Village, it is projected that the project will produce a maximum increase in population of 15,000 to 16,500 persons.

Corresponding to growth of the Secondary Urban Center are increased local employment opportunities. The Secondary Urban Center is planned to provide balanced growth with a full complement of facilities and services to encourage business. Areas of concentrated employment opportunities include

the James Campbell Industrial Park, the Ko'olina Resort and the proposed Kapolei Town Center located immediately west of the proposed Kapolei Village site.

Kapolei Village will provide local employment opportunities for proposed commercial sites. The proposed project contains approximately 480,000 square feet of commercial area. Assuming one-third of that area is used for commercial building space (160,000 square feet) and by using an island-wide average of one employee per 250 square feet of commercial space, 640 jobs will be created by the development. Additional jobs will be available in staffing schools and recreational facilities.

The master plan of Kapolei Village is designed with 3,722 single-family units, 283 multi-family units, 173 assisted units, 255 rental units, and 438 elderly units.

Kapolei Village, as well as neighboring communities, would provide increased housing opportunities, especially for median to low income families. An innovative design concept of Kapolei Village is to provide a mixture of housing types including affordable units (elderly, gap-group and assisted), 60 percent of the total housing stock and market units (sold at market values), 40 percent of the total housing stock.

8.5 NOISE

Noise impacts generated from future traffic within the project site are expected to be relatively minor as development occurs. Although a significant increase in noise levels is expected with the overall development of the Secondary Urban Center, it is anticipated that noise levels within Kapolei Village will remain at acceptable levels.

To effectively minimize noise impacts generated from automobiles, the proposed project will use perimeter walls around the project site. By implementing sound attenuation walls, earth berms and vegetation between housing units and roadways, traffic noise, as well as dust and visual disruption will be reduced.

Noise generated from cane haul trucks during harvesting of sugarcane will impact initial development of Kapolei Village. However, due to the anticipated withdrawal of sugarcane operations at project build-out, no long term impacts will result. Mitigation to alleviate noise impacts during initial phases of project development include a sound attenuation wall bordering the cane haul road passing through the site and advance notification to buyers concerning noise from sugarcane operations.

Adverse impacts resulting from different land uses within the project site are not expected to occur. Design of the proposed project incorporates the use of landscaping features and land buffers between different land use types to effectively screen or diminish noise impacts. Additionally, architecture of the proposed project will maximize noise containment between structures. Noise generated by construction activities will be in compliance with Title 11, Administrative Rules, Chapter 43. Construction activities that may exceed the allowable noise levels will require variances sought from Chapter 43.

Noise and safety impacts of flight operations from the adjacent NAS BARPT on the project area and environs have been the subject of a number of studies. The U.S. Navy prepared an Air Installations Compatible Use Zone (AICUZ) Study (1984) which established off-station noise contours and safety zones.

The AICUZ identifies significant noise impacts to the project site. A "noise arm" of 65 Ldn and above crosses the top portion of the site following Flight Tracks 7/11. Approximately 11 percent of the site lies within the 65 Ldn+ Zone. Another 56 percent lies within the 60 Ldn to 65 Ldn contours with the balance of 33 percent lying within an area below 60 Ldn.

Accident Potential Zones (APZ) are areas under aircraft flight paths which have a higher than normal potential for aircraft accidents. The three zones of accident potential used in the NAS BARPT AICUZ include: (1) clear zones, the first 3,000 feet of the trapezoidal approach/departure zone at

each end of the runway representing the area of highest potential hazards; (2) APZ I, a 5,000-foot long by 3,000-foot wide zone beyond the clear zone representing lesser hazard potential than the clear zone; and (3) APZ II, a 7,000-foot long by 3,000-foot wide zone beyond the APZ I representing areas less hazardous than the APZ I. Approximately 108 acres of the site was identified to lie within APZ II. An additional one-third acre of the site at the extreme southeast corner lies within the APZ I zone. None of the site lies within the clear zone.

Subsequent studies done by the Estate of James Campbell and the HFDC have questioned many of the findings of the U.S. Navy AICUZ report. These questions relate to the magnitude and extent of off-station noise and safety zones.

The 1984/85 Campbell Estate studies contend that the use of 365-day averaging and the correction of jet fighter/trainer and civilian aircraft flight operations would eliminate the 65 Ldn noise arm crossing the project site and reduce aircraft noise levels below 60 Ldn over 90 percent of the site. The Estate's studies further contend that the potential for accidents at NAS BARPT is such that it does not meet the basic definition for APZ's found in Navy regulations as there is no supporting rationale for applying an APZ to the Runway 4L departure path. The vast majority of fixed wing operations at the air station are accomplished by large, four-engined aircraft that are among the safest in the Navy's inventory.

In December 1986, the Hawaii Housing Authority commissioned Darby & Associates, Acoustical Engineers, to "objectively review and comment on those portions of the (Navy AICUZ study and subsequent Campbell Estate Studies) and data pertaining to aircraft noise impact on the proposed Kapolei Village site." The principal findings of the noise study support some of the findings of previous Campbell Estate studies. Major points discussed in their report are:

- Civilian aircraft noise levels used in the 1984 AICUZ study appear unreasonably large;
- The high noise levels for jet aircraft operations (reported in the 1984 AICUZ study) over the HHA project site appear to be overstated; and
- A 365-day averaging should be used in order to be consistent with other long term noise impacts analyses.

The result of the analysis indicates that "there should not be sufficient aircraft noise impact to place constraints on residential housing within the project site according to local and Federal guidelines."

In light of the apparent controversy between the U.S. Navy and others over noise and safety impacts, a conservative approach, using the AICUZ study, has been taken within the design of Kapolei Village. No residential land uses are sited within the hypothetical 65 Ldn "noise arm" traversing across the northern portion of the project site. Uses within this noise arm include the golf course, a church site, a commercial site, and a Park-and-Ride facility. Land use lying within the APZ I and APZ II include only golf course and drainage right-of-ways.

8.6 TOPOGRAPHY AND SOILS

Impacts occurring on the physical terrain from development of the project site are expected to be minimal. Because the existing site is relatively flat, relatively little grading will be required. Prior to site preparation, it will be necessary to strip existing vegetation. To minimize soil erosion during the construction process, erosion control measures will be designed and implemented during the construction phasing in accordance with City and County regulations.

Generally, most of the soil is considered low to moderately expansive. Local soft zones in the clay were encountered beneath drainage ditches, irrigation trenches and in areas where water leaked from irrigation hoses.

Easy excavation and conventional site grading procedures are anticipated for earth work in these areas. Soils that are moderately expansive could require special procedures for house foundation design, such as deep footings, subgrade saturation or capping with non-expansive soils.

8.7 FLORA AND FAUNA

No rare, threatened or endangered plant species (as defined by the State and Federal Governments) have been found to exist on the project site. The proposed project is not expected to have significant impact on flora as the site consists primarily of cultivated lands. The few native plant species which are found in the vicinity of the project site are of little botanical interest.

There are no rare, threatened or endangered vertebrate animal species known to exist on the project site. Because there are no ponds on the site, no native waterbirds have been observed. There are also no significant wooded areas on the project site and the site does not provide suitable nesting and roosting areas.

Introduced bird species, especially those compatible with man such as the common myna and house sparrow, are expected to increase in numbers when the project is completed as it will provide additional habitats (trees, grassy areas, etc.).

8.8 WATER

The total average water demand for the development is estimated at 2.8 mgd. According to the BWS, the proposed development will be serviced from the existing 30-inch main along Farrington Highway originating from existing BWS wells in Waipahu. As development occurs, a second 30-inch transmission line will be added along Farrington Highway parallel to the existing main. A new 5.0 mg water tank located in Honouliuli is planned to provide future service to the project site via the Honouliuli Booster Station. When existing storage is exceeded, a reservoir located north of the project site will be required for additional storage capacity.

These proposed facilities are planned to adequately serve Kapolei Village, as well as neighboring developments. With approval and implementation of these proposed facilities, no adverse impacts are anticipated either for the immediate project site or regionally. Approval of the water system for Kapolei Village is required by the BWS.

8.9 SEWER

The average daily sewer flow generated by the development is projected at 2.1 mgd. Sewage generated by the project site is to be conveyed via the West Beach interceptor sewer to the Honouliuli Wastewater Treatment Plant (WWTP) for treatment and disposal. Proposed off-site improvements, including upgrading the West Beach interceptor from Barbers Point Access Road to the Honouliuli WWTP to accommodate flows from Kapolei Village.

Additionally, the Honouliuli WWTP is scheduled for expansion to accommodate new development in the Ewa District. Currently, the WWTP processes 21 mgd. Current capacity of the WWTP is 25 mgd. With expansion of the facility to be completed in 1993, expected capacity is 38 mgd which is projected to accommodate all development in the Ewa District.

The sewer system will be adequate to serve the proposed development. The sewer system will be designed in accordance with the Division of Wastewater Management, City and County of Honolulu, and the Department of Health, State of Hawaii.

8.10 DRAINAGE

At present, the project site contains no drainage system and storm runoff passes through the project site via cane field ditches. Development of the project site will include an effective drainage system, diverting storm runoff via underground box culverts and open channels to a detention basin (which utilizes the golf course area).

The detention basin will serve to attenuate the downstream peak flow rates by providing temporary storage of the runoff. The basin is sized to hold a

volume of runoff equivalent to the additional amount generated as a result of the project. The detained runoff will be released at a controlled rate after the storm subsides. A small culvert at the exit will be able to pass everyday low flows.

Runoff generated off-site will be directed around the development to the NAS BARPT coral pit for disposal by infiltration and evaporation. Estimated peak flow to the coral pit after development is 2,430 cubic feet per second (cfs). The only improvement to the off-site drainage system is upgrading the drainage swale north of Farrington Highway to prevent overflowing onto Farrington Highway during a 100-year storm.

Drainage improvements implemented within the project development, as well as other neighboring developments, will have a positive impact on NAS BARPT since runoff presently sheet flows into the base.

It is anticipated that the constituent quality of runoff from the project site will change. As development occurs, runoff could contain a decrease in nitrogen and suspended solids and an increase in phosphorus.

8.11 SOLID WASTE

Currently, solid waste for the region is disposed of at the Palailai and Waianae Landfills. Both of these landfill sites are expected to close in mid 1988 and are not expected to provide refuse disposal services for the proposed Kapolei Village. However, a new landfill site is currently under construction at Waimanalo Gulch and is expected to open as the other two landfill sites close. Additionally, a Garbage-to-Energy H-POWER facility, located in the James Campbell Industrial Park is scheduled to become operational in late 1990.

8.12 POWER AND COMMUNICATIONS

No adverse impacts resulting from off-site and on-site improvements are anticipated. Proposed off-site power and communication requirements include a telephone switching station to serve the proposed Kapolei Town

Center and the project site, and an electrical substation when existing power capacities are exceeded. Proposed on-site power and communications improvements consist of electrical and telephone conduits provided along the major roadways. The system also includes street lights and hand holes. Electrical and telephone systems will be underground within the development.

SECTION 9

**IRREVERSIBLE/IRRETRIEVABLE COMMITMENTS OF RESOURCES,
AND THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF
THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT
OF LONG-TERM PRODUCTIVITY**

SECTION 9

IRREVERSIBLE/IRRETRIEVABLE COMMITMENTS OF RESOURCES AND THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

9.1 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Development of Kapolei Village will involve the irretrievable loss of certain environmental and fiscal resources. However, the costs associated with the use of these resources should be evaluated in light of recurring benefits to the residents of the region, State of Hawaii and the City and County of Honolulu.

It is anticipated that the construction of the proposed project will commit the necessary construction materials and human resources (in the form of planning, designing, engineering, construction labor, landscaping, and personnel for the sales, management, services offices, and maintenance functions). Reuse for much of these materials and resources is not practicable. Although labor is compensated during the various stages of development, labor expended for project development is non-retrievable.

Air and noise quality will be adversely affected by the proposed development, but will remain in compliance with State standards. While ambient air and noise quality in the area is relatively good, the proposed development will result in a greater number of vehicles traveling to and from the project site, creating vehicular pollution emissions.

9.2 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF HUMANITY'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

No short-term exploitation of resources resulting from development of the project site will have long-term adverse consequences. The appearance of the project site will be altered from its present open sugarcane environment to that of a completed planned residential community. The completed development will be visually integrated with the eventual surrounding environments of the Secondary Urban Center.

Long-term community gains resulting from development of the project include residential and commercial uses which will likely benefit future homeowners, the landowners, private businesses, and the State and County governments. As the property develops, its productivity in terms of generating tax revenues will increase. Income from property, personal, and excise taxes are expected to more than offset expenses associated with expanded public facilities and services to meet the requirements of the development and population growth.

SECTION 10

LIST OF ORGANIZATIONS AND AGENCIES CONSULTED AND LIST OF EIS PREPARERS

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SECTION 10

LIST OF ORGANIZATIONS AND AGENCIES CONSULTED
AND LIST OF EIS PREPARERS

10.1 PARTICIPANTS IN THE EIS PREPARATION PROCESS

A. Federal Agencies

- * Department of Agriculture, Soil and Conservation Service
- * Department of the Army, U.S. Army Engineer District, Honolulu
- * Department of the Navy, Naval Base Pearl Harbor
- * Department of the Interior, Fish and Wildlife Service
- * Department of Housing and Urban Development

B. State Agencies

- * Department of Accounting and General Services
- * Department of Agriculture
- * Department of Education
- * Department of Health
- * Department of Land and Natural Resources
- * Department of Business and Economic Development
- * Department of Transportation
- * Office of Environmental Quality Control
- * Land Use Commission
- * Environmental Center

C. County Agencies and Boards

- * Department of General Planning
- * Department of Housing and Community Development
- * Department of Land Utilization
- * Department of Parks and Recreation
- * Department of Public Works
- * Board of Water Supply
- * Fire Department
- * Police Department

D. Public Utilities
* Hawaiian Electric Company

E. Neighborhood Boards, Community Associations
* Sunset Beach Rezoning Committee

10.2 LIST OF EIS PREPARERS

R. M. Towill Corporation	Bruce T. Tsuchida, Project Manager Chester Koga, EIS Coordinator Cary Brockman, Technical Writer
Darby & Associates	Ron Darby, Principal
Parsons, Brinckerhoff, Quade and Douglas, Inc.	Julian Ng, Traffic Engineer
Char & Associates	Winona Char, Principal
Paul H. Rosendahl, Ph.D., Inc.	Paul H. Rosendahl, Principal
Decision Analysts, Hawaii	Bruce Plasch, Principal
J. W. Morrow, Environmental Management Consultant	J. W. Morrow, Principal