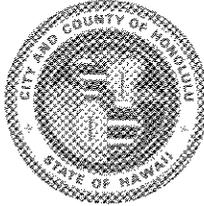


PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR



CHERYL D. SOON
CHIEF PLANNING OFFICER
CAROLL TAKAHASHI
DEPUTY CHIEF PLANNING OFFICER

May 11, 1995

BS 4/95-0744

Honorable Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
Central Pacific Plaza
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Acceptance Notice for the Proposed
East Kapolei Project,
Final Environmental Impact Statement

We are notifying you of our acceptance of the Final Environmental Impact Statement (FEIS) for the proposed East Kapolei project. Pursuant to Section 11-200-23(e), Chapter 200, Title 11 ("Environmental Impact Statement Rules") of the Hawaii Administrative Rules, this acceptance notice should be published in the May 23, 1995 OEQC BULLETIN.

We have attached our Acceptance Report of the Final EIS for the East Kapolei project and the "DOCUMENT FOR PUBLICATION IN THE OEQC BULLETIN." Should you have any questions on the matter, please contact Brian Suzuki of our staff at 527-6073.

Sincerely,

A handwritten signature in cursive script that reads "Cheryl D. Soon".

CHERYL D. SOON
Chief Planning Officer

CDS:ft

Attachment

cc: Leslie Kurisaki, Helber Hastert & Fee Planners
Mike Angotti, Schuler Homes, Inc.

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EAST KAPOLEI PROJECT

EWA, OAHU, HAWAII

FINAL
ENVIRONMENTAL IMPACT
STATEMENT

APRIL 1995

PREPARED FOR: SCHULER HOMES, INC.

PREPARED BY: HELBER HASTERT & FEE, PLANNERS

EAST KAPOLEI PROJECT

EWA, OAHU, HAWAII

FINAL
ENVIRONMENTAL IMPACT
STATEMENT

APRIL 1995

PREPARED FOR: SCHULER HOMES, INC.

PREPARED BY: HELBER HASTERT & FEE, PLANNERS

FOR
SUBMITTAL TO: PLANNING DEPARTMENT
CITY & COUNTY OF HONOLULU

IN SUPPORT OF: EWA DEVELOPMENT PLAN
LAND USE MAP AMENDMENT

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APPENDICES

- A. Letter from Russell Alger, Director of Hawaii Asset Management, The Estate of James Campbell, dated October 13, 1994.

Letter from Keith Ahue, Chairman, Board of Land and Natural Resources, State of Hawaii, October 19, 1994
- B. Letter from Donna B. Goth, Director of Hawaii Development, The Estate of James Campbell, dated October 6, 1994.
- C. Memorandum from Don Hibbard, Administrator, State Historic Preservation Division, Department of Land and Natural Resources, dated September 22, 1994.
- D. East Kapolei Project Market Assessment Report
Gail W. Atwater, AICP, October 1994
- E. Socio-Economic Impact Assessment of East Kapolei Residential Project
Community Resources, Inc., November 1994
- F. Environmental Noise Assessment, East Kapolei Project
Darby & Associates, September 1994
- G. East Kapolei Project: Impact on Agriculture
Decision Analysts Hawaii, Inc., September 1994
- H. Oahu Biological Resources Survey Report
Evangeline Funk, Ph.D., July 1994

- I. Air Quality Impact Report, East Kapolei Project
J. W. Morrow, October 4, 1994
- J. Potable Water Master Plan for the East Kapolei Area
Tom Nance Water Resource Engineering, October 1994
- K. Traffic Impact Assessment Report for East Kapolei Project
Pacific Planning and Engineering, Inc., October 1994.
- L. Proposed Revisions to Ewa DP Special Provisions

PREFACE

Since publication of the Draft EIS in January 1995, minor changes have been made to the eastern boundary of the Phase 2 area, which reduced Phase 2 acreage from 604 to 556 acres. Land use tables and figures in the FEIS have been revised accordingly. The modification to the property boundary did not change the total number of residential units proposed (10,000 units total), nor the commercial, park and school acreages. The minor reduction in overall project acreages does not change the findings of the various technical studies, potential project impacts or proposed mitigation measures.

Agency comments on the DEIS and the associated response letters are included in a new Chapter 13. Comments covered a wide range of issues, including concerns over offsite drainage impacts, the perceived need for onsite drainage retention/detention, water source, potential use of nonpotable water, traffic and schools. Responses to all comments are provided in the accompanying letters reproduced in Chapter 13. In addition, several modifications have been made to the FEIS text as a result of the review comments. A summary of the major changes is provided below.

1. Unresolved Issues

Section 1.5, Unresolved Issues, has been revised to include the project's water source. An expanded discussion of unresolved drainage issues is also provided.

2. Project Description

The discussion in Section 2.3, Existing and Proposed Surrounding Land Uses, has been updated to include a description of the Kapolei Business Park and the City of Kapolei.

3. Existing Public Plans, Policies and Controls

The discussion of State Plan objectives and policies in Chapter 3 have been expanded to include energy-related objectives and impacts. A discussion of the project's relationship to individual CZM policies and objectives has been included. A summary of City Council Resolution No. 94-296, establishing new objectives and policies for storm water management, has been added to Section 3.3.4.

4. Public Facilities and Services

Discussion of impact on police facilities and services has been clarified. In response to a request from the City and County Planning Department, an expanded discussion of the project's fiscal impact was provided as an addendum to the DEIS Social Impact Assessment Report and summarized in the EIS.

1.

INTRODUCTION AND SUMMARY

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CHAPTER 1 INTRODUCTION AND SUMMARY

1. Introduction

This Environmental Impact Statement (EIS) has been prepared in support of a Development Plan (DP) Land Use Map application submitted by Schuler Homes, Inc. and Hawaiian Trust Company, Ltd., ("applicant") to the City and County of Honolulu Planning Department (PD). The project area (also referred to as the application area) consists of 1,056 acres at Kapolei, Ewa, Oahu. The application seeks to amend the existing Ewa Development Plan Land Use Classification for the project area from "Agriculture" to "Low Density Apartment," "Parks and Recreation," "Public and Quasi-Public" and "Commercial." Proposed changes to the Ewa Development Plan Special Provision are also requested.

The project is presently referred to as the "East Kapolei Project," given its location in east Kapolei. The entire 1,056-acre project area is presently in the State Agricultural District. A 500-acre portion of the project area, referred to as Phase 1, is included in a petition for district boundary amendment submitted by the Governor's Office of State Planning in September 1994 (Docket No. A94-708) to the State Land Use Commission.

The project is subject to Chapter 343, HRS (Environmental Impact Statement Law) as it requires an amendment to the City and County of Honolulu's Ewa Development Plan. The City Planning Department has determined that the project may have a significant effect on the environment and has therefore required the preparation of this environmental impact statement.

1.2 Development Summary

Project Name: The 1,056-acre development is collectively referred to as the "East Kapolei Project."

Applicant: Schuler Homes, Inc.
828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813
Attention: Mr. Michael Angotti, Director of Land Services

Phase 1 of the East Kapolei project is being developed by a joint venture of Schuler Homes, Inc. and Hawaiian Trust Co., Ltd., and is included in a State Land Use Commission petition (Docket No. A94-708), submitted by the Office of State Planning in September 1994. Phase 2 of the East Kapolei Project will be developed by Schuler Homes, Inc.

Accepting Agency:

Planning Department
City and County of Honolulu
850 South King Street, 8th Floor,
Honolulu, Hawaii 96813
Attention: Mr. Brian Suzuki

Preparers of the EIS:

Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813
Attention: Ms. Leslie Kurisaki, Senior Associate

Landownership:

The State of Hawaii has recently received a "Final Order of Condemnation" from The Estate of James Campbell (EJC) with respect to 300 acres of Phase 1, as part of an 1,100-acre condemnation action initiated by the State in June 1990. The 200-acre balance of Phase 1 is being transferred to the State from EJC, and the entire 500-acre Phase 1 area will be transferred from the State, after urban boundary redistricting, to Hawaiian Trust Company, Ltd. (Phase 1 Joint Venture partner with Schuler Homes, Inc.), as part of a land exchange for Galbraith Trust Estate lands in Poamoho, Central Oahu. The Estate of James Campbell holds title to the 556-acre Phase 2. Phase 2, with the exception of a 27-acre parcel adjacent to Farrington Highway, will be acquired from EJC by Schuler Homes, Inc.

The Estate of James Campbell and the State of Hawaii (through its Department of Land and Natural Resources) have authorized Schuler Homes, Inc. to file this application with the Honolulu Planning Department to amend the Ewa Development Plan Land Use Map (See authorization letters in Appendix A).

Location:

Ewa (Kapolei) area of west Oahu; south of Farrington Highway and north of Ewa Villages (see Figures 1 and 2)

Tax Map Key:

9-1-17:04 (por) (see Figure 3)

Project Area: East Kapolei "Project Area": 1,056 acres
Phase 1: 500 acres
Phase 2: 556 acres

Existing State Land Use: Phase 1: State Agricultural District. State Land Use Petition filed in September 1994 by Office of State Planning to redistrict lands to the Urban District; LUC Docket No. A94-708 (see Figure 4).
Phase 2: State Agricultural District.

Honolulu Development Plan (DP) Land Use Map Designation: Agriculture

Honolulu DP Public Facilities Map Designation: Plans Beyond Six Years: Construction of the North-South Road along the western boundary of the project area; a freeway interchange from the H-1 Freeway; widening of Farrington Highway; and a new electrical substation (Ewa Nui).
Private Funding: Construction of a water pump station along the northern boundary of the Phase 2 portion of the project area and potable water transmission lines along Farrington Highway.

Land Use Ordinance/Zoning: Ag-1, Restricted Agriculture

Applicant Request: Applicant requests an amendment to the Ewa Development Plan Land Use Map (and related changes to the DP Special Provisions) to support the development of a 1,056-acre, affordable residential community. The proposed East Kapolei project will include up to 10,000 residential units developed over an approximate 15-year period. The development will also include associated commercial, educational (elementary schools) and recreational (neighborhood park and district park) facilities.

1.3 Summary of Probable Impacts and Mitigation Measures

Affordable Housing. The project will increase the existing housing stock in the Ewa-Kapolei region by up to 10,000 units over a 15 year period. Approximately 60 percent of the total units will be affordable to families earning less than 140 percent of County median income. Thirty percent, or about 3,000 of the homes, will be affordable to families earning below 120 percent of median income, and 1,000 homes will be affordable to families earning below 80 percent of median.

Employment. The project will generate both short-term construction jobs and permanent operations jobs. The project will support some 750 or more full-time direct construction jobs each year through the year 2010. About 900 direct on-site operations jobs will be generated, primarily at the neighborhood commercial areas, with an additional 500 indirect and induced jobs statewide supported by spending by direct operations enterprises and employees.

Fiscal Impacts. Income of direct construction employees will average about \$35 million annually between 1996 and 2010. The project will generate up to \$6.5 million in annual property tax revenues for the City and County at buildout. State revenues from construction (excise taxes, corporate income taxes and personal income tax) will average over \$6 million annually during the construction period and add up to some \$105 million (1994 dollars) as of buildout.

Population and Demographics. The project's mix of multi-family and single family units will increase the resident population of the area. The development is expected to have over 6,000 residents in Phase 1 by the year 2000; up to 24,500 residents by the year 2010; and about 28,000 residents in both phases at full buildout. The projected increase is consistent with City and County population guidelines for 2010, and will bring the Ewa population closer to the General Plan's target goals.

Transportation. The proposed project will significantly change the traffic flow quality at major area intersections if roadway improvements are not made. Roadway improvements are proposed for the year 2005 at the intersections of Farrington Highway and the future North-South Road with the main project spine road. An extra through lane on Farrington Highway is also proposed. For the year 2011, the possibility of a grade separation at the intersection of Farrington Highway and North-South Road would increase capacity through the area. However, alternate transportation actions, including development of a comprehensive plan for the area, are also recommended.

Infrastructure. The applicant will be required to construct all major project infrastructure including potable water, wastewater collection, on-site drainage improvements and major electrical and roadway system improvements. A water master plan for the region has been prepared and is now being reviewed by the Honolulu Board of Water Supply. A sewer system will be provided to collect and transport project-generated sewage to the

Honouliuli Wastewater Treatment Plant. A wastewater master plan is also being prepared.

The project area spans two separate drainage basins: the West Loch tributary basin and the Kaloι Gulch drainage basin. Within West Loch, a drainage proposal to provide a concrete channel/culvert from the project boundary to an existing detention basin constructed by the City Department of Housing and Community Development is currently being reviewed by the City. A preliminary regional drainage report for the Kaloι Gulch drainage basin has been submitted to the City Department of Public Works for review. Both drainage proposals suggest alternatives to providing onsite detention/retention to address City requirements for stormwater quality and pollution prevention. Should these proposals be deemed unacceptable, onsite detention/retention will be provided.

Electrical power will be provided via Hawaiian Electric Company's proposed Ewa Nui substation. Underground cables will provide telephone and cable television service.

Soils. The primary soil type is Kunia silty clay, encompassing about 60 percent of the site. The soils are classified as "B" or prime agricultural land, according to the University of Hawaii's Land Study Bureau (LSB) Detailed Land Classification system. The Agricultural Lands of Importance to the State of Hawaii (ALISH) system identifies the project area soils as "Prime Agricultural Land."

Flora and Fauna. There are no threatened or endangered species of flora or fauna on the project site. Vegetation on site includes ruderal or wayside vegetation, Koa haole/grass and agricultural fields. The three indigenous plants found on site (Ilima, Popolo and Akulikuli) are commonly found in the coastal lowlands. Fourteen bird species were identified on or around the site. However, because the entire site has been extensively modified by agricultural activity, it has almost no value as native bird habitat.

Air Quality. The principal source of short-term air quality impact will be construction activity, including construction vehicle emissions and particulates associated with earthmoving. Long-term impacts will result from vehicular emissions, and indirect impacts associated with electrical power generation. Mitigation measures include appropriate dust control during construction and setting back residential structures from major roadway intersections. Energy conservation measures should be considered to minimize electrical power demands, and recycling and composting should be considered to minimize solid waste generation.

Noise. Short-term, temporary noise impacts will be generated during construction by earth-moving equipment such as bulldozers and diesel-powered trucks. The anticipated increase in vehicular traffic associated with the project may be perceptible at noise sensitive locations along Farrington Highway and in the residential areas. Mitigation of construction noise will be accomplished by compliance with Department of Health noise regulations and noise mufflers on construction equipment. Recommended traffic noise

mitigation along Farrington Highway and North-South Road include properly constructing a sound barrier along the roadway which blocks the line-of-sight to traffic.

Visual Resources and Open Space. The development of the project will gradually and irretrievably alter the visual resources along Farrington Highway, the H-1 Freeway and from the areas makai of the property. The present agricultural uses and open space will diminish as the area is developed. Due to the relatively flat topography, views of Honolulu from the site will be obstructed by multi-story development except for areas along the property's fringes. Major views of the Waianae Range from makai areas should not be obstructed.

Recreational Facilities. The project will provide two 10-acre neighborhood park sites and a 25-acre district park site, for a total of 45 acres of dedicated parks. Additional open space and park areas will be provided and maintained by homeowners associations within the project.

Schools and Libraries. The project will increase demand on public educational facilities in the Ewa area which are presently insufficient to meet the growing population of the region. Two eight-acre sites for new elementary schools will be provided within the project area. The developer has entered into discussions with the Department of Education regarding possible contributions to offset the impact on the project on public schools. Current State plans to expand library services, including construction of a new Kapolei Library, will accommodate additional project residents.

Historical and Archaeological Resources. Because of extensive, agriculture-related land modification during the last 70 to 80 years, there are no known archaeological or historic resources on the site. No significant impacts are anticipated, and the Department of Land and Natural Resources, State Historic Preservation Division has concurred with this "no effect" determination.

Agriculture. The project site is presently leased to Oahu Sugar Company, Ltd. (OSCo) for sugar cane cultivation. OSCo has announced plans to cease cultivation of the project area after its 1995 harvest, for reasons unrelated to the proposed development. As such, the project will have no impact on sugar operations. The project will have an indirect positive impact on pineapple cultivation, as the Phase 1 acreage is part of a land exchange for some 2,000 acres of pineapple land in Poamoho, Central Oahu. If the land exchange had not occurred, the subject residential project would have been developed on the Poamoho lands, causing considerable disruption to existing pineapple operations.

1.4 Alternatives Considered

Several alternatives to the proposed action were considered, including "no action," commercial development and other public facilities. The proposed action, affordable residential development, was deemed to be the preferred alternative. A more detailed discussion of these alternatives can be found in Chapter 7.

1.5 Unresolved Issues

North-South Road

This major regional highway is being developed by the State and County. The applicant is expected to contribute its fair share to fund construction. Initial phases of the project are not dependent on the roadway, and the actual development timing of the facility is beyond the applicant's direct control.

Drainage

The applicant has presented what it believes to be technically feasible and well conceived plans to address the project's drainage requirements. Several components of the plan are either not under the control of the applicant or are still awaiting approval from government agencies.

Kaloi Gulch. Complete resolution of drainage improvements within the Kaloi Gulch drainage basin will require coordination with other landowners within the drainage basin. The seaward terminus point for the Kaloi Gulch must also be selected. A regional concept proposal to construct a direct channel, siltation basin and outlet to the ocean within the Ewa Marina site has been suggested and will require discussion with the Department of Public Works and the Ewa Marina developer.

West Loch. A proposal for improvements within the West Loch drainage basin has been distributed for review. The improvements include a concrete channel within an existing cane haul road ROW, adjacent to a future City and County park site, connection to and modification of an existing detention basin, and construction of a grass channel connection to the proposed Ewa by Gentry-East detention basin. Further coordination is required with the Department of Public Works and Gentry Homes to define the scope of the improvements.

The Ewa by Gentry-East detention basin improvements are also pending subject to review and approval of an EIS for that project.

Water Source

Discussions with the Board of Water Supply and the landowner are ongoing to resolve questions regarding water source.

1.6 Compatibility with Land Use Plans and Policies

Chapter 3 include a discussion of the project's compatibility with existing government plans, policies and objectives. Because of the competing nature of many of these plans, policies and objectives, the project supports many and is inconsistent with others. Generally, the plan is consistent with State and County growth policies related to the second city and housing policies related to the production of affordable housing.

1.7 Necessary Permits and Approvals

Development of the property as proposed will require a number of permits and approvals from State and County agencies. A summary of required approvals is provided below.

<u>Approval</u>	<u>Authority</u>
<i>State of Hawaii</i>	
Land Use District Boundary Amendment	Land Use Commission
National Pollutant Discharge Elimination System (NPDES) permit	Department of Health
Water Commission Approvals	State Water Commission
<i>City and County of Honolulu</i>	
Ewa DP Land Use Amendment	City Council
Ewa DP Special Provisions Amendment	City Council
Ewa DP Public Facilities Map Amendment	City Council
Zoning Change	City Council
Water Master Plan	Board of Water Supply
Subdivision Approvals	Department of Land Utilization
Grading Permits	Department of Public Works
Building Permits	Building Department

1.8 Statement of Purpose and Need for Action

The applicant is requesting an amendment to the Ewa DP Land Use Map to change the land use designation of the area of application from Agriculture to Low Density Apartment, Parks and Recreation, Public and Quasi-Public and Commercial. The purpose of this action is to permit the development of up to 10,000 residential units and associated commercial, educational (elementary school) and recreational (neighborhood park, district park) facilities.

1.9 Purpose of and Need for this Environmental Impact Statement

The purpose of this Environmental Impact Statement (EIS) is to describe a proposal for the development of the 1,056-acre East Kapolei residential project. The EIS is a disclosure document which provides information on all known or potential effects that a proposed action may have on the environment, economic and social welfare of the community and State. It includes the potential impacts of the proposed project, both beneficial and adverse, and proposes measures to either avoid or minimize adverse impacts to the environment.

An application for Development Plan Amendment and Environmental Assessment for the proposed East Kapolei Project was submitted to the City and County of Honolulu Planning Department in November 1994. The proposed action was subject to the provisions of Chapter 343, Hawaii Revised Statutes, Environmental Impact Statements, because the proposed amendment to the Ewa Development Plan would result in a designation other than agricultural, conservation or preservation.

By letter dated November 10, 1994, the Planning Department notified the Office of Environmental Quality Control (OEQC) that it had determined that the project may have a significant effect on the environment and that an EIS was required. Notice of this determination was published in the November 23, 1994 edition of the *OEQC Bulletin*, and the 30-day public review period ended on December 23, 1994. Chapter 12 contains a listing of agencies, organizations and individuals consulted during the pre-assessment period (during preparation of the environmental assessment/EISPN). A list of agencies, organizations and individuals consulted during preparation of the Draft EIS (DEIS) is found in Chapter 13. The chapter also contains reproductions of written comments on the EIS Preparation Notice (EISPN) received by December 23, 1994 and the applicant's response to those comments.

Notice of the DEIS was published in the January 23, 1995 edition of the OEQC Bulletin. This began a 45-day public comment period which ended on March 9, 1995. Chapter 14 contains reproductions of written comments on the DEIS, as well as responses to those comments.

2.

PROJECT DESCRIPTION

CHAPTER 2 PROJECT DESCRIPTION

2.1 Location

The 1,056-acre East Kapolei Project is located in east Kapolei in the Ewa area of west Oahu. As shown in Figure 1, the property is surrounded by Farrington Highway to the north, by agricultural lands to the east, the Ewa Villages residential area to the south, and by the proposed North-South roadway alignment and University of Hawaii campus to the west.

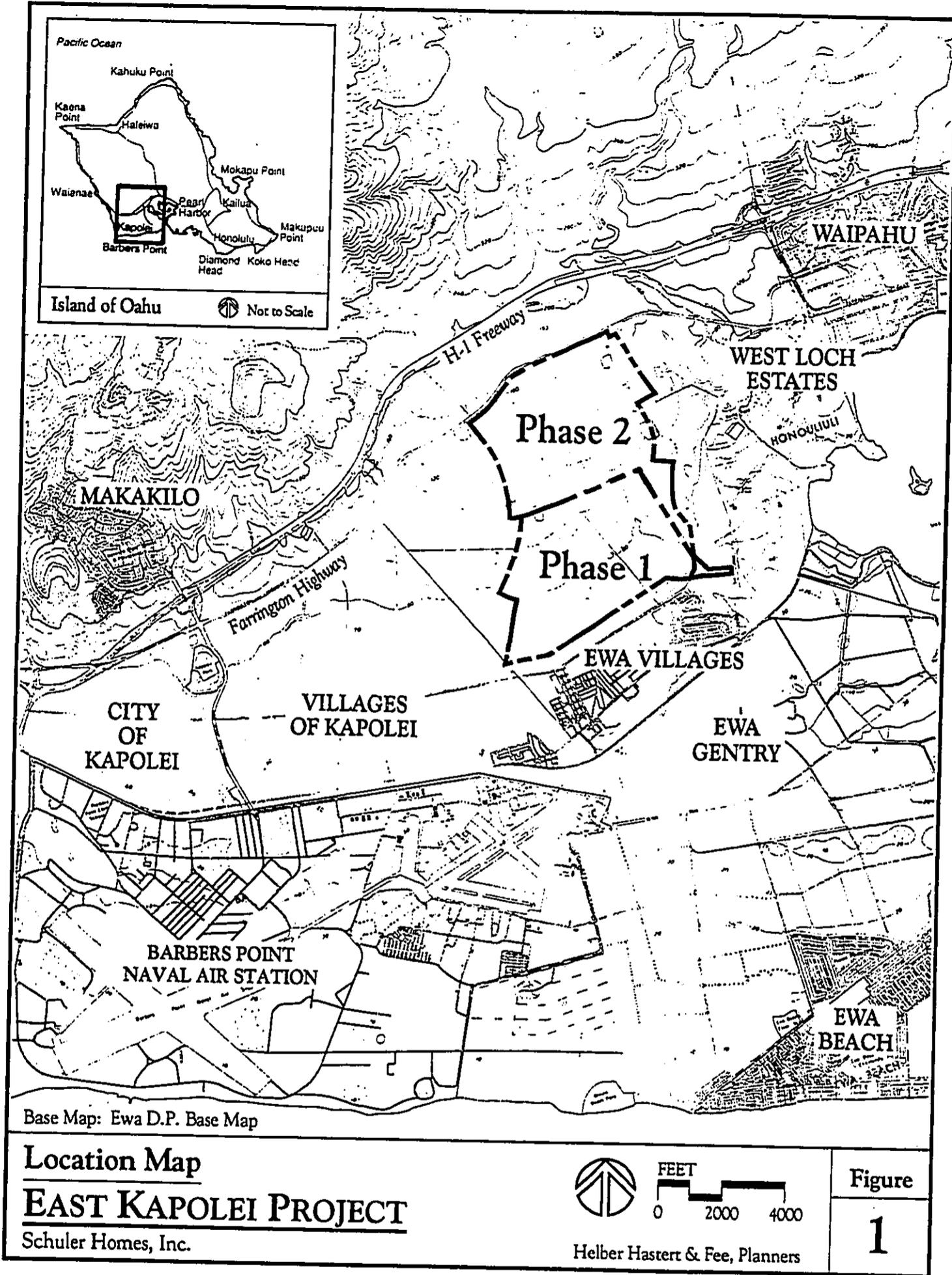
The Ewa-Kapolei area is a growing community designated in the City's General Plan as Oahu's "second city." Existing and proposed land uses in the Ewa-Kapolei region are shown in Figure 2, the Kapolei Area Long Range Master Plan, prepared by the Estate of James Campbell (dated July 1993). The project area is shown in agricultural use on the map.

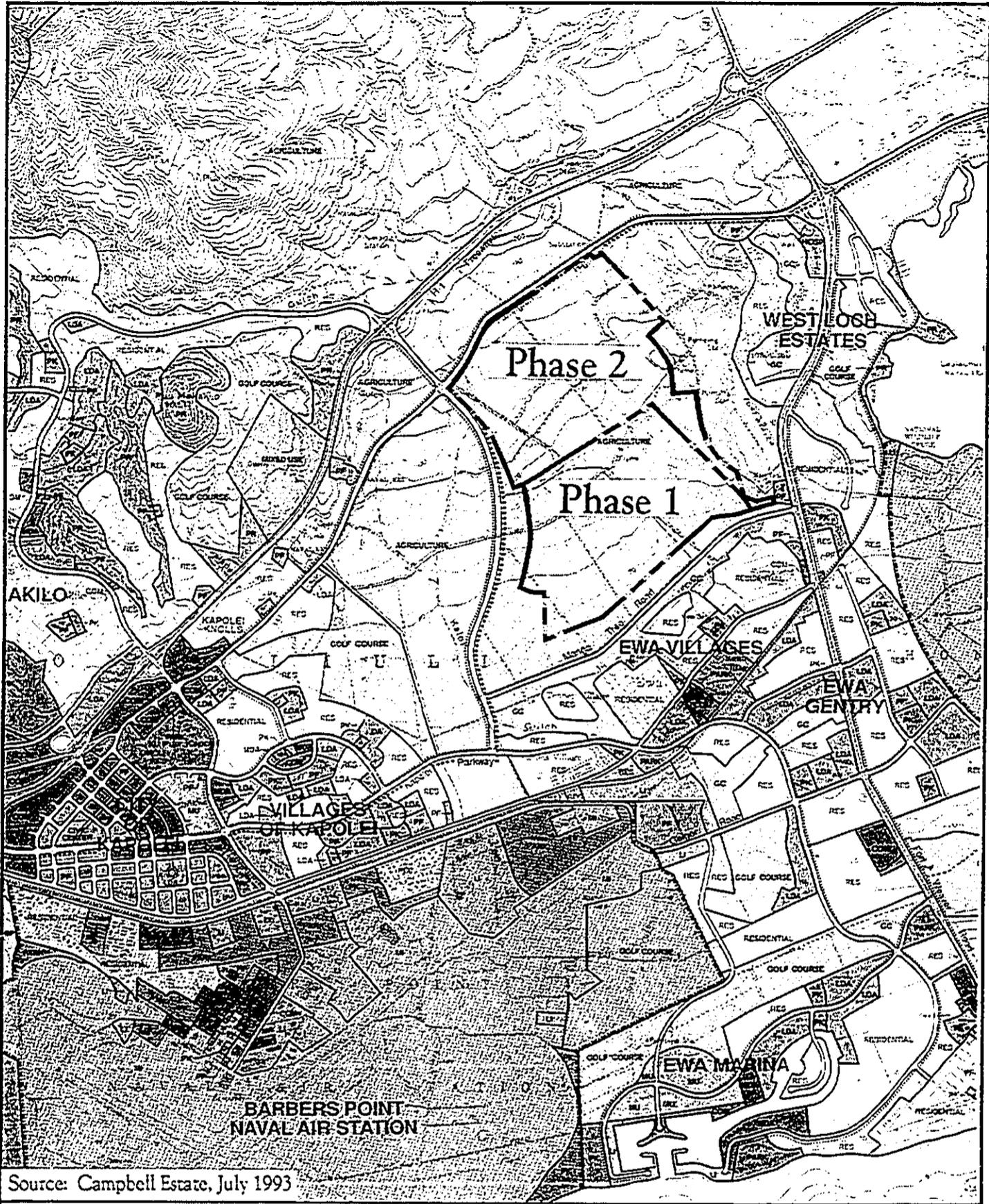
2.2 Background

The East Kapolei Project is comprised of two phases. The entire project area is identified as TMK 9-1-17:04 (por), shown in Figure 3. Phase 1 of the project (500 acres) is being developed by a joint venture of Schuler Homes, Inc. and Hawaiian Trust Company, Ltd. Phase 2 (556 acres) is being developed by Schuler Homes, Inc. Both phases of the East Kapolei Project are included in this application.

The entire 1,056 acre project area is located in the State Agricultural District. The 500-acre Phase 1 was recently acquired by the State as part of a 1,100 acre condemnation action initiated in June 1990. The Phase 1 area was included in a petition for State Land Use District boundary amendment submitted to the State Land Use Commission (LUC) by the Office of State Planning in September 1994 (Docket No. A94-708) (Figure 4). Following urban boundary redistricting, the entire 500-acre Phase 1 area will be transferred from the State to Hawaiian Trust Company, Ltd. (Phase 1 Joint Venture partner with Schuler Homes, Inc.), as part of a land exchange for Galbraith Trust Estate lands in Poamoho, Central Oahu. Phase 2 of the project area, with the exception of a 27-acre parcel adjacent to Farrington Highway, is being acquired from EJC by Schuler Homes, Inc. A petition for a Land Use District Boundary Amendment for Phase 2 will be submitted by Schuler Homes, Inc. in the near future.

The Estate of James Campbell and the State of Hawaii (through its Department of Land and Natural Resources) have authorized Schuler Homes, Inc. to file this application with the Honolulu Planning Department to amend the Ewa Development Plan Land Use Map (See authorizations letter in Appendix A).



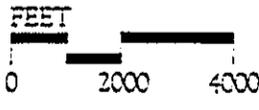


Source: Campbell Estate, July 1993

Kapolei Area Long Range Master Plan

EAST KAPOLEI PROJECT

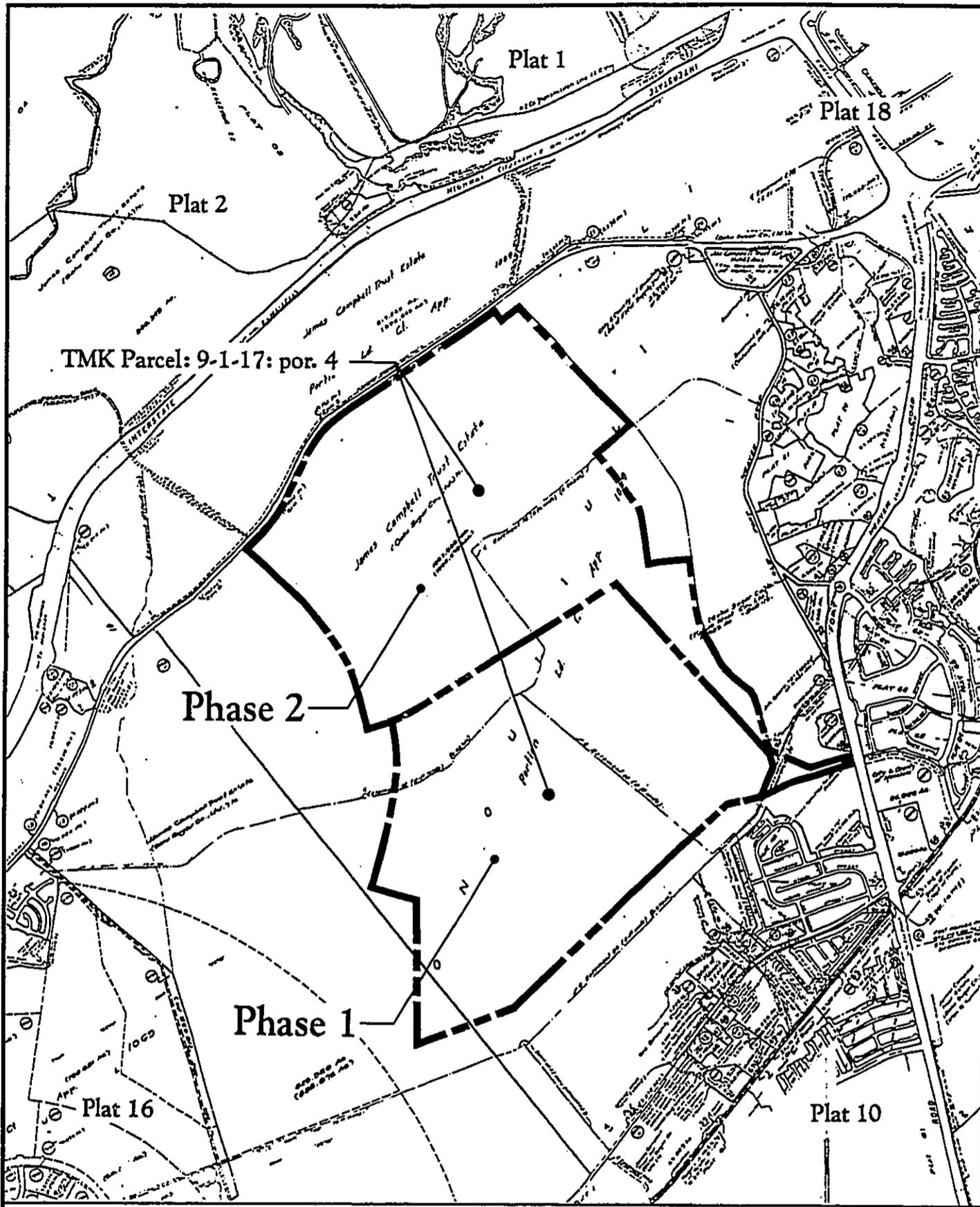
Schuler Homes, Inc.



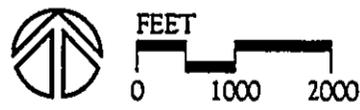
Figure

2

Helber Hassert & Fee, Planners



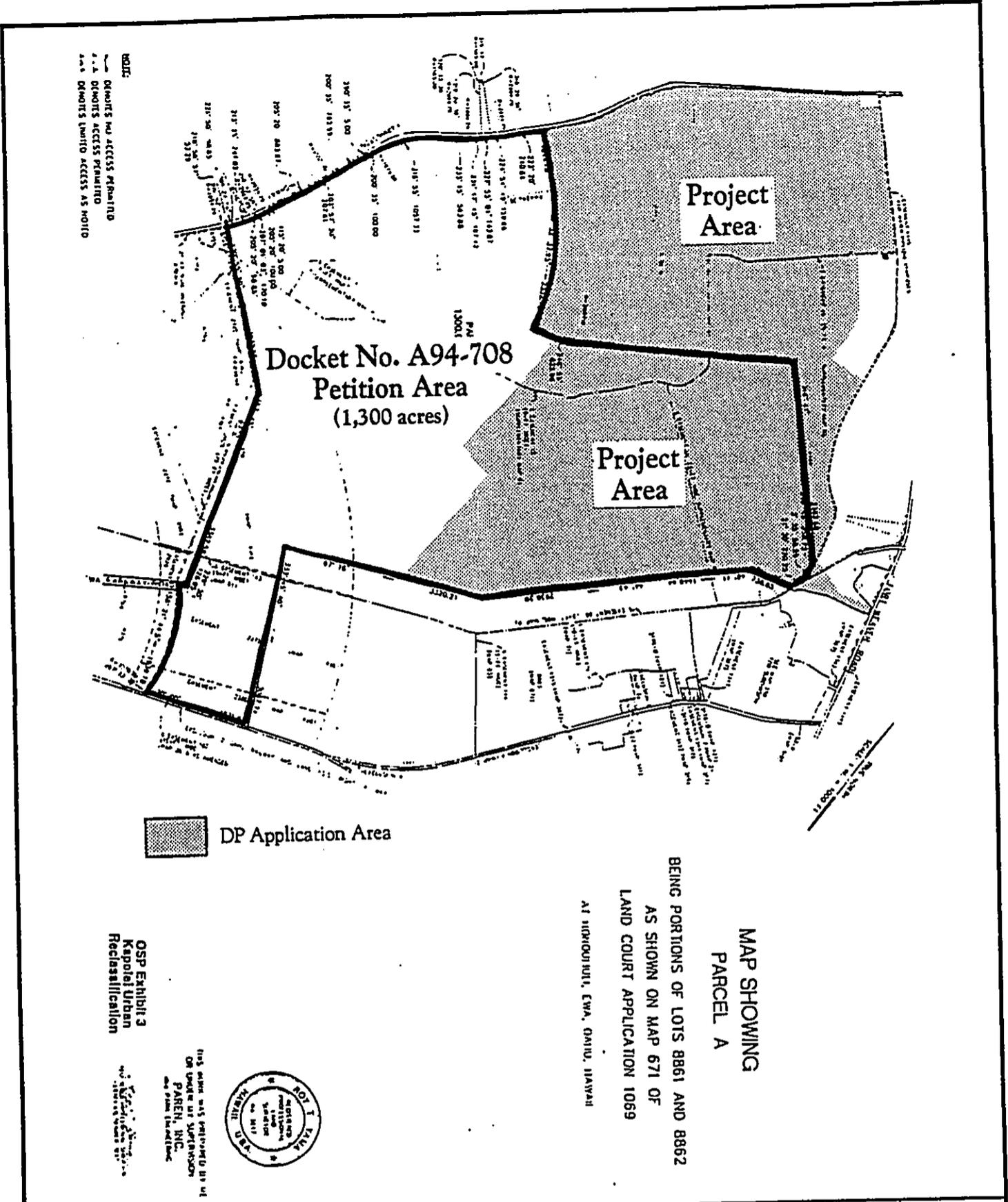
Tax Map Parcels
EAST KAPOLEI PROJECT
 Schuler Homes, Inc.



Helber Hastert & Fee, Planners

Figure

3



LUC Docket No. A94-708 Petition Area

EAST KAPOLEI PROJECT

Schuler Homes, Inc.

Not to Scale

Helber Hastert & Fee, Planners

Figure

4

2.3 Existing and Proposed Surrounding Land Uses

The project site has been planted in sugar cane for most of this century, and the entire 1,056-acre project area is under lease to Oahu Sugar Company (OSCo). Due to financial hardship, OSCo has announced it will cease sugar cane cultivation in 1995, when its leases expire. One final harvest of sugar cane is scheduled in the near future. The landowners have negotiated with truck farmers to continue agricultural use of the land in the next few years.

The Ewa-Kapolei area is comprised of many different and distinct communities, both old and new. Existing residential development in the vicinity of the project includes the older Honouliuli residential area and the West Loch residential development and golf course to the east, the plantation-era Ewa Villages to the south and the Villages of Kapolei to the west. The City of Kapolei, Barbers Point Naval Air Station and proposed Ewa Marina project are also within a two mile radius of the site. To the northeast lies Waipahu town, and to the northwest, the residential community of Makakilo.

A brief description of the major surrounding land uses is provided below:

2.3.1 Major Residential Communities

Ewa Villages

The Ewa Villages plantation housing, located just south (makai) of the subject project, developed around the Ewa sugar mill in the early part of the century. At one time, there were eight villages, housing immigrant plantation workers from Portugal, Spain, Korea, Japan and the Philippines. Four of the newer villages--Renton, Tenney, Varona and Fernandez--are still standing, while the older four have been demolished. The population of the Ewa Villages was 3,780 in 1990. The City Department of Housing and Community Development has plans for revitalizing the Ewa Villages, including developing additional residential units, expanding the Ewa Elementary School, creating a new golf course, district park and commercial/retail center and business park. The plan also includes rental and homeownership programs for village residents.

Ewa Beach

The town of Ewa Beach, located about 2-1/2 miles makai of the project, began as a weekend recreational area in the 1940s and eventually developed into a permanent residential community. There were 3,426 housing units in Ewa Beach in 1990.

Naval Air Station (NAS) Barbers Point

The NAS Barbers Point is located just over a mile to the southwest of the project site. This facility was established during World War II as a major Navy aviation station. Today, the station comprises 3,700 acres and operates on a 24-hour basis. There are three 7,000-foot runways which allow operation of fixed-winged and rotary-winged aircraft. In 1990, NAS Barbers Point had 2,218 residents. (In addition, the Iroquois Point military housing area, in east Ewa, houses about 5,000 persons). NAS Barbers Point has been scheduled to close in 1997 as part of the national base realignment initiative. However, Navy housing units, as well as recreation areas, will be retained after the Navy aviation facility closes. The airfield is being considered for civilian general aviation uses and possible continued use by the U.S. Coast Guard.

Makakilo

Residential development in Makakilo commenced in 1962, and presently encompasses 1,202 acres. Makakilo is located to the northwest of the site, on the makai side of the H-1 Freeway. The area, which includes single and multi-family, mid-priced homes, was developed primarily by Finance Realty. In 1990, there were nearly 10,000 residents at Makakilo, with two-thirds of the population having arrived after 1985. Development is more than half-way through and a total of 6,174 homes are anticipated at build-out.

Ewa by Gentry

Ewa by Gentry is located about a mile to the south (makai) of the project, off Fort Weaver Road. This development's first subdivision, Soda Creek, was opened in 1988. By 1990, Ewa Gentry had 752 homes and a population of 2,000. Gentry Development Company plans to ultimately construct about 8,300 homes on about 1,000 acres of land. To date, about 3,500 units have been completed, with the remainder scheduled to be built through 1999. Planned community facilities include an 18-hole golf course, elementary school, two community parks and a neighborhood commercial center.

West Loch Estates/Fairways

The West Loch Estates/Fairways was developed by the City and County of Honolulu, and encompasses 491 acres in Honouliuli, on the western edge of Pearl Harbor's West Loch. West Loch is located directly east (Diamond Head) of the subject project. Phase 1 of the West Loch project, which has a total of 593 units, was completed in 1990. A total of 1,600 residential units are planned by buildout. Other planned features of community include a commercial center, church, child care facilities, Asing Community Park within the civic center, an 18-hole municipal golf course and a 40-acre shoreline park.

Villages of Kapolei

The State Housing Finance and Development Corporation in conjunction with the Honolulu Department of Housing and Community Development is developing the master planned residential community at Kapolei. The first homes in the Villages of Kapolei were completed in 1990, with up to 5,000 units on 830 acres planned at buildout. Kapolei will include a variety of residential types, including market rate and affordable single and multi-family units, and assisted, rental and elderly housing. A full range of community support facilities are also planned at Kapolei, including an 18-hole golf course, parks and recreational amenities, churches, schools and commercial areas.

2.3.2 Non-Residential Developments

City of Kapolei

The Estate of James Campbell is in the process of developing an approximately 890-acre commercial center in the area roughly bounded by the Barbers Point Access Road to the east, the Naval Air Station Barbers Point to the south, the Ko Olina Resort option area to the west, and the lower slopes of Makakilo to the north. The heart of this site is the City of Kapolei, a triangular-shaped 570-acre parcel.

The development concept for the city is to provide a self-contained, urban economic center. The development program for the City of Kapolei calls for over seven million square feet of office and retail space, a 73-acre regional park and 2,200-foot riverwalk. In addition, land within the City of Kapolei will be dedicated to the State of Hawaii and City and County of Honolulu for government offices and other public facilities including parks, bus terminal, civic center, police station and regional library.

Kapolei Business Park

The Kapolei Business Park (KBP) is located on 800 acres between the James Campbell Industrial Park and the City of Kapolei. Development of this new facility will be limited to light industrial and maritime-related uses. The park is zoned I-2, and the first increment includes 135 acres. The KBP is expected to generate about 6,090 jobs by the year 2010.

James Campbell Industrial Park (JCIP)

Campbell Estate developed this park as a heavy industrial complex in 1959. Major tenants in this 1,367 acre complex include two oil refineries, a concrete manufacturing plant, cattle feed lot operation, large building material supply yards, numerous light industrial businesses and the City's H-POWER plant.

Barbers Point Harbor

The new State-owned harbor is located at the northwestern edge of the JCIP. The first increment of the development was completed in 1990, and ships now make regular calls at the harbor. Facilities include 1,600 feet of pier, 30 acres of paved back-up area and related infrastructure, and a bulk cargo ship unloader. Harbor development is scheduled to be completed in the next 15 to 20 years, with a total of 237 acres of developed area surrounding the basin. The harbor is being planned to accommodate Oahu's shipping needs for the next 50 years.

Ko Olina

Ko Olina is a planned resort community at the southwest end of the Ewa region, being developed by West Beach Estates. To date, one hotel, a golf course and man-made beaches and lagoons have been developed, with plans for up to 8,700 housing units within the 1,000 acre resort. A basin for a 350 to 400 slip marina has already been constructed.

Other Proposed Facilities

The State of Hawaii is planning to develop a West Oahu Campus of the University of Hawaii on the 500-acre site directly to the west of the project area. The State Board of Land and Natural Resources has also identified a 50-acre parcel for future development of a new Kapolei High School, also directly west of the project. Approximately 200 acres to the southwest have been designated for residential development by the State Department of Hawaiian Home Lands (DHHL). The university site, high school site and DHHL site are all part of the 1,300 acres that the State is acquiring from the EJC.

The State and County also have plans for future construction of a major north-south regional roadway along the western boundary of the project area. Plans include a freeway interchange, providing direct access from the H-1 Freeway and Farrington Highway to the proposed Kapolei Parkway regional connector roadway, and the communities of Ewa Gentry and Ewa Beach.

Schuler Homes will participate with other major developers in the area on the preparation and implementation of the Ewa Region transportation master plan. The developer has been coordinating its involvement through the Estate of James Campbell which is spearheading the master plan effort.

2.4 Objectives of the Action

The objective of the action (Ewa DP Land Use Map amendment) is to permit development of up to 10,000 residential unit in two phases over an approximate 15 year period. The project also proposes development of associated neighborhood commercial, school and park facilities.

2.5 Project Proposal

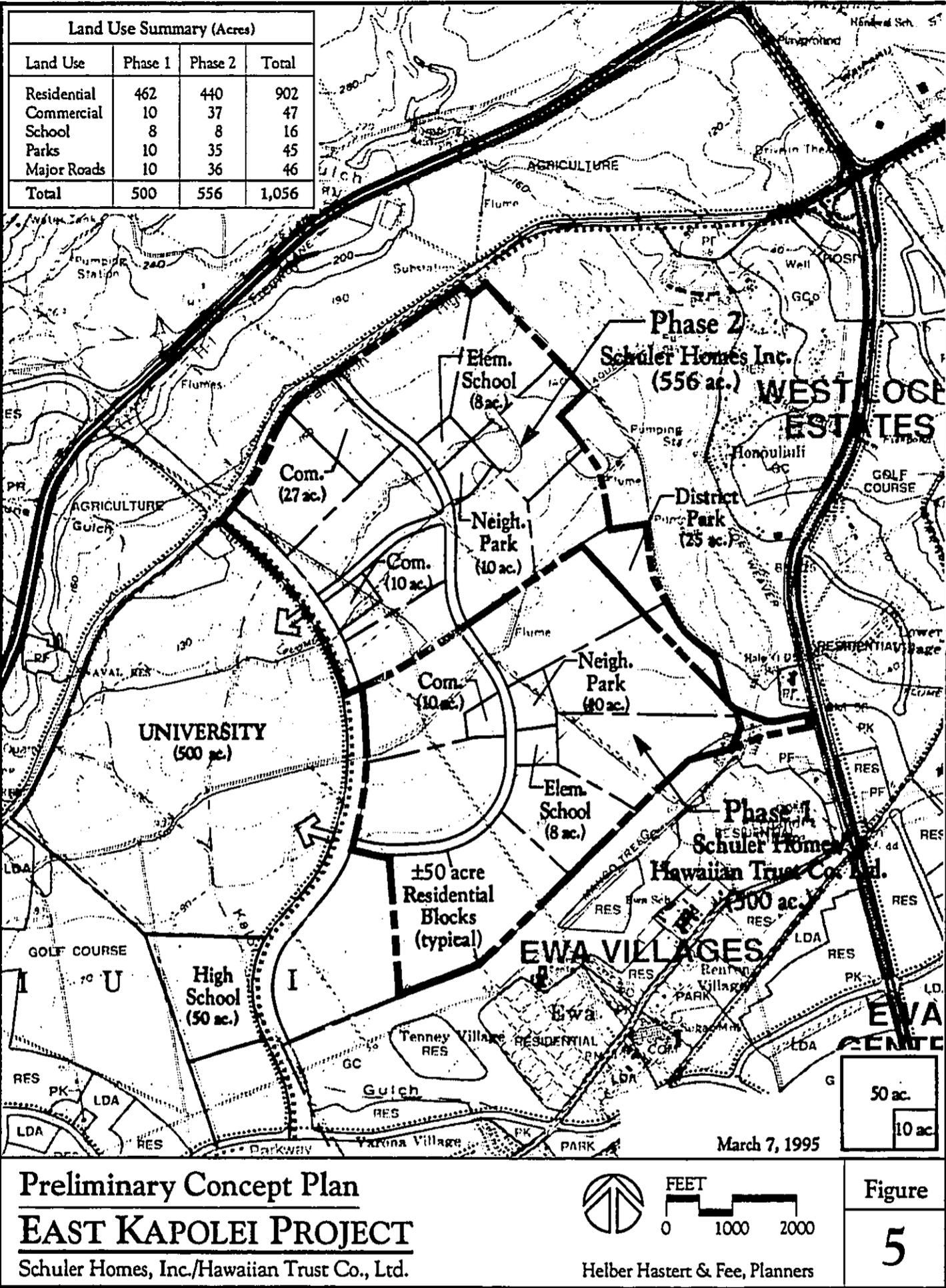
The East Kapolei Project is a residential development, which will include ancillary land uses such as parks, neighborhood commercial areas and sites for elementary schools. A spine road will provide access from Farrington Highway through the project area. The proposed concept plan for the project is shown in Figure 5. The following Table 1 summarizes the proposed land uses and acreages, as designated in the plan.

**Table 1:
Proposed Land Uses**

Land Use	Area (acres)	Average Density (Du/Ac)	Dwelling Units
<u>Phase 1</u>			
Residential	462	11/ac.	5,000
Neighborhood Commercial	10		
Elementary School (1)	8		
Neighborhood Park (1)	10		
Major Roads	<u>10</u>		
Subtotal	500		<u>5,000</u>
<u>Phase 2</u>			
Residential	440	11/ac	5,000
Commercial	37		
Elementary School (1)	8		
Neighborhood Park (1)	10		
District Park (1)	25		
Major Roads	12		
North-South Roadway	<u>24</u>		
Subtotal	556		<u>5,000</u>
Grand Total	1,056 acres		10,000 units

2.5.1 Residential

The applicant is proposing to develop up to 10,000 residential units in two phases over a 15-year period. The housing mix in each phase will consist of about 75 percent multi-family apartments and townhomes and 25 percent single family units. The proposed densities range from 20 units/acre for the affordable multi-family units to seven units/acre for the market-priced single family homes, resulting in average residential densities of about 11 to 12 units/acre.



Of the total units, it is estimated that 30 percent will be affordable to families below 120 percent of (City and County of Honolulu) median income. Of the affordable units, one third (ten percent of all units) will be priced for families with incomes below 80 percent of median income. The remaining affordable units (twenty percent of all units) will be affordable to families in the 81 to 120 percent of median income bracket. In addition to the affordable units, another 30 percent of the project inventory is projected to be available at prices affordable to families earning between 120 and 140 percent of median income.

2.5.2 Neighborhood Commercial/Commercial

Three commercial parcels are shown in the preliminary concept plan (Figure 5). Two 10-acre parcels for neighborhood commercial uses are identified, one in each of the two project phases. These parcels are centrally located with respect to the surrounding residential development, and are conveniently situated adjacent to major project roadways. These parcels may be developed in several smaller parcels instead of single, 10-acre parcels. The 27-acre commercial area adjacent to Farrington Highway will be retained and developed for commercial purposes by The Estate of James Campbell.

2.5.3 Parks

The plan includes two 10-acre sites identified for neighborhood parks, serving each of the two development phases. The park sites are located along the proposed primary access road, and adjacent to the proposed commercial centers and proposed elementary school sites. In addition, a 25-acre site for a district park is included in the Phase 2 area. The final location of the district park is subject to change.

2.5.4 Schools

Eight-acre elementary school sites are identified in each of the two project phases. As noted above, the school sites are in centralized locations, generally within a five to ten minute walk of all residential areas and are situated adjacent to proposed County neighborhood parks.

2.5.5 Access Road

A main project spine road will be constructed as a primary thoroughfare within the project area, and to connect Phases 1 and 2. This road will also provide the only vehicular access to the project via Farrington Highway, until completion of the North-South Road and freeway interchange.

2.6 Project Rationale

In the residential sector, Honolulu continues to be one of the least affordable cities in the nation. While land prices account for some of this problem, there has been a long-term imbalance between supply and demand which has increased the cost of housing. The purpose of the East Kapolei project is to meet the need for affordable and moderately priced housing for Hawaii's residents within Oahu's second urban center at Kapolei. The development team has a proven track record in delivering high quality housing products in this critical segment of Hawaii's housing market. The City and County General Plan specifically identifies a policy to encourage development within the secondary urban center at Kapolei and the Ewa urban fringe to meet housing needs not provided in the primary urban center.

The East Kapolei project will bring population in the second city closer to General Plan population goals. The market study area for the East Kapolei project was defined as Oahu's residential market extending along the H-1 corridor, including the entire Ewa Development Plan area and Central Oahu's master planned communities of Royal Kunia and Waikele. Within this market study area, demand for an additional 36,070 to 40,884 housing units is estimated by the year 2010. Without the East Kapolei project, there is expected to be a shortfall of 8,509 to 13,222 units.

2.7 Project Phasing

The entire plan will be implemented over an estimated 15-year period. The 10,000 residential units will be developed in two consecutive phases, with up to 5,000 units coming on-line during each phase. Development will commence in the northeast corner of Phase 1 and the adjacent 40-acre portion of Phase 2 (including the 25-acre district park), and proceed in a clockwise direction. Development activities in this manner will minimize construction-period dust impacts on downwind residential areas, and allow initial development to occur in the West Loch drainage basin.

It is estimated that Phase 1 will be developed between 1997 and 2004, and Phase 2 between 2005 and 2011. Residential home production is expected to average about 750 units per year. The ancillary neighborhood commercial and recreational facilities will be developed as demands dictate. The main project spine roadway will be constructed as part of the first phase. Phase 1 of the project is expected to commence in 1997 when final regulatory approvals have been granted.

2.8 Use of Public Funds or Lands

The proposed development will not use any public lands, nor will it require any new commitment of publicly supported services and facilities not compensated by increases in tax revenues. The 500-acres of Phase 1 which is being transferred to Hawaiian Trust Company from the State is privately-owned (The Estate of James Campbell) and is being

3.

RELATIONSHIP OF THE PROPOSED PROJECT TO EXISTING
PUBLIC PLANS, POLICIES AND CONTROLS

CHAPTER 3
RELATIONSHIP OF THE PROPOSED PROJECT TO EXISTING PUBLIC
PLANS, POLICIES AND CONTROLS

3.1 Federal

The Naval Air Station (NAS) Barbers Point is located about two miles southwest of the project site. NAS Barbers Point has been identified for closure by 1997 by the federal Base Realignment and Closure Commission. Presently, a Barbers Point Reuse Committee is investigating alternative uses for the station, including a State general aviation reliever airport, continued use by the U.S. Coast Guard, and a City and County regional park. The proposed East Kapolei project is not expected to have an impact on plans for reuse of NAS Barbers Point. However, development of regional, recreational or community support facilities at the former air station could have a positive impact on the project, expanding regional amenities available to project residents.

3.2 State of Hawaii

3.2.1 Hawaii State Plan

The Hawaii State Plan (Chapter 226, HRS, as amended) establishes a set of guidelines for the statewide planning system, and provides the overall theme, goals, objectives, policies and priority guidelines. The following describes the 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; provide a basis for determining priorities and human resources, land, energy, water and other resources; improve coordination of federal, 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 goals, objectives policies and guidelines of the Hawaii State Plan are, on occasion, in competition with one another. As a result, the proposed project supports some of the goals, while it is inconsistent with others. The following analyzes the project's impacts with respect to relevant State Plan goals, objectives, policies and priority guidelines:

Section 226-5 Objectives and policies for population.

Section 226-5(b)(1) *Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.*

Section 226-5(b)(3) *Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.*

Section 226-5(b)(7) *Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.*

Discussion: The proposed project is located in the Ewa-Kapolei region of west Oahu, designated in State and City and County policies as Oahu's "second city." The second city concept encourages future population growth and the development of employment centers within this region. In support of further urban development in Ewa-Kapolei, the City and County of Honolulu is planning a major County facility at the Kapolei Civic Center and the provision of regional municipal services such as police and fire stations. The State of Hawaii has plans for major highway improvements, including construction of the North-South Road; and has jointly constructed over 4,000 residential housing units at Kapolei. The development of the East Kapolei project is consistent with ongoing public and private efforts to develop a new urban center in the region.

Section 226-7 Objectives and policies for the economy - agriculture.

Section 226-7(a)(1) *Continued viability in Hawaii's sugar and pineapple industries.*

Section 226-7(a)(2) *Continued growth and development of diversified agriculture throughout the State.*

Section 226-7(b)(6) *Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs*

Discussion: The proposed project site is presently being used by Oahu Sugar Company (OSCo) for sugarcane cultivation. However, OSCo has announced plans to cease operations for reasons unrelated to the project, and therefore, the project will have no impact on plantation agriculture. The project will have an indirect positive impact on pineapple cultivation, as the Phase 1 area was part of a land exchange for high quality pineapple lands in Poamoho, Central Oahu. Had the land exchange not occurred, the subject residential project would have been developed on the Poamoho lands, resulting in significant costs and disruption of those ongoing operations. There will be a temporary benefit to diversified agriculture in that 500 acres in Phase 1 will be made available for diversified crops until the land is needed for development. Over the longer term, the project will not limit the growth of diversified agriculture, since far more agricultural land

has been released from plantation agriculture than has been absorbed by other activities. Ample prime agricultural land and water is available on Oahu and Statewide.

Section 226-15 Objectives and policies for facility systems - solid and liquid wastes and
Section 226-66 Objectives and policies for facility systems - water.

Section 226-15(b)(1) *Encourage the adequate development of sewerage facilities that complement planned growth.*

Discussion: The City and County Department of Wastewater Management is master planning the wastewater system for a region which includes the project site, bounded by Kapolei to the west, West Loch Estates to the east, H-1 Freeway to the north and the Ewa Villages to the south. A sewer system for the project will be provided to collect and transport sewage to the Honouliuli Wastewater Treatment Plant. The project will not commence until the Department of Wastewater Management confirms that adequate capacity exists or that capacity can be accommodated in expansion phases.

Section 226-16(b)(1) *Coordinate development of land use activities with existing and potential water supply.*

Discussion: As with the wastewater system, a water master plan, encompassing the project region, is now being reviewed by the Honolulu Board of Water Supply. Proposed developments which will be served by the master plan include the East Kapolei project, the proposed University of Hawaii-West Oahu, the proposed Kapolei high school, and Department of Hawaiian Home Lands and EJC-owned lands. The water master plan identifies source requirements, storage requirements and major transmission requirements to provide potable water to the master plan area.

Section 226-18 Objectives and policies for facility systems--energy/telecommunications.

Section 226-18(c)(3) *Promote prudent use of power and fuel supplies through conservation measures including education and energy efficient practices and technologies.*

Discussion: The project will comply with all City and County building codes and ordinances applicable to residential structures.

The transportation sector has been identified as the single largest consumer of energy in the State. The project will enhance the development of the "second city" in Ewa-Kapolei, which is intended to reduce the need for automobile commuting between downtown Honolulu and suburban Oahu. It is expected that many project residents will also work in

the Ewa-Kapolei region, eliminating the need for lengthy home-work commuting. As the Kapolei region further develops its residential, commercial and other support facilities, overall automobile commuting and therefore, fossil fuel consumption will be reduced even further.

Section 226-19 Objectives and policies of socio-cultural advancement--housing.

Section 226-19(a)(1) *Greater opportunities for Hawaii's people to secure reasonably priced safe, sanitary, livable homes located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals.*

Section 226-19(a)(2) *The orderly development of residential areas sensitive to community needs and other land uses.*

Section 226-19(b)(3) *Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style and size of housing.*

Discussion: The primary objective of the proposed project is the provision of housing opportunities. At full build-out, the project will provide approximately 10,000 new homes for Oahu residents, 60 percent of which (6,000 units) will be affordable to families earning up to 140 percent of median income. Thirty percent of the units, or about 3,000 homes, will be affordable to families earning below 120 percent of median income, with 1,000 of these homes affordable to families earning below 80 percent of median. The development will include a variety of housing types, including market-priced single family homes and townhomes; and both market and affordable multi-family units. The project's location in the expanding Ewa-Kapolei "second city" ensures that adequate public and community services as well as employment opportunities are accessible to residents.

Section 226-21 Objective and policies for socio-cultural advancement--education.

Section 226-21(b)(2) *Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.*

Section 226-21(b)(5) *Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.*

Discussion: The project will include the provision of two eight-acre sites for new elementary schools to serve the project and surrounding areas. In addition, the State has plans to open a new Kapolei High School and a University of Hawaii-West Oahu campus on sites adjacent to the project area. These proposed projects will ensure that the community has accessible educational facilities, ranging from the primary to post-

secondary higher education. The applicant intends to work closely with the State DOE to ensure adequate school facilities are developed in a timely manner to meet the needs of the East Kapolei community.

3.2.2 State Functional Plans

The Hawaii State Plan directs the appropriate State agencies to prepare functional plans for their respective program areas, including: agriculture, transportation, conservation lands, housing, tourism, historic preservation, energy, recreation, education, higher education and health. The State Functional Plans serve as the primary implementing vehicle for the goals, objectives and policies of the Hawaii State Plan.

The plans set forth "...the policies, statewide guidelines, and priorities within a specific field of activity, when such activity or program is proposed, administered, or funded by an agency of the State" (Section 226-2 [10] Hawaii Revised Statute). Each functional plan contains objectives to be achieved and policies to be pursued within the specified areas. "...Such policies shall address major programs and the locations of major facilities" (Section 226-57 (b) HRS).

The State Functional Plans have been adopted by the Hawaii State Legislature. The State Plan mandates that these plans "...shall be taken into consideration in amending the county general plans" (Section 226-52 (a)(3) HRS). The project generally supports the objectives and policies of the following State Functional Plans:

State Housing Functional Plan

The Housing Finance and Development Corporation coordinated the preparation of this functional plan. The Plan includes homeownership, rental housing and rental housing for the elderly and other special need groups as issue areas.

Issue area: Homeownership

Policy A(2): *Encourage increased private sector participation in the development of affordable for-sale housing units.*

Policy A(3): *Ensure that (1) housing projects and (2) projects which impact housing provide a fair share/adequate amount of affordable homeownership opportunities.*

Discussion: The project, which is being proposed by a private developer, will include up to 6,000 units at prices affordable to families earning up to 140 percent of City and County median income. This represents 60 percent of the total units proposed.

State Transportation Functional Plan

The preparation of the Transportation Functional Plan was coordinated by the State Department of Transportation.

Issue Area I. Congestion

Policy I.B.1.: *Close the gap between where people live and work through decentralization, mixed zoning and related initiatives.*

Implementing Action I.B.1.a.: *Promote the development of the Ewa Second City to provide jobs near homes.*

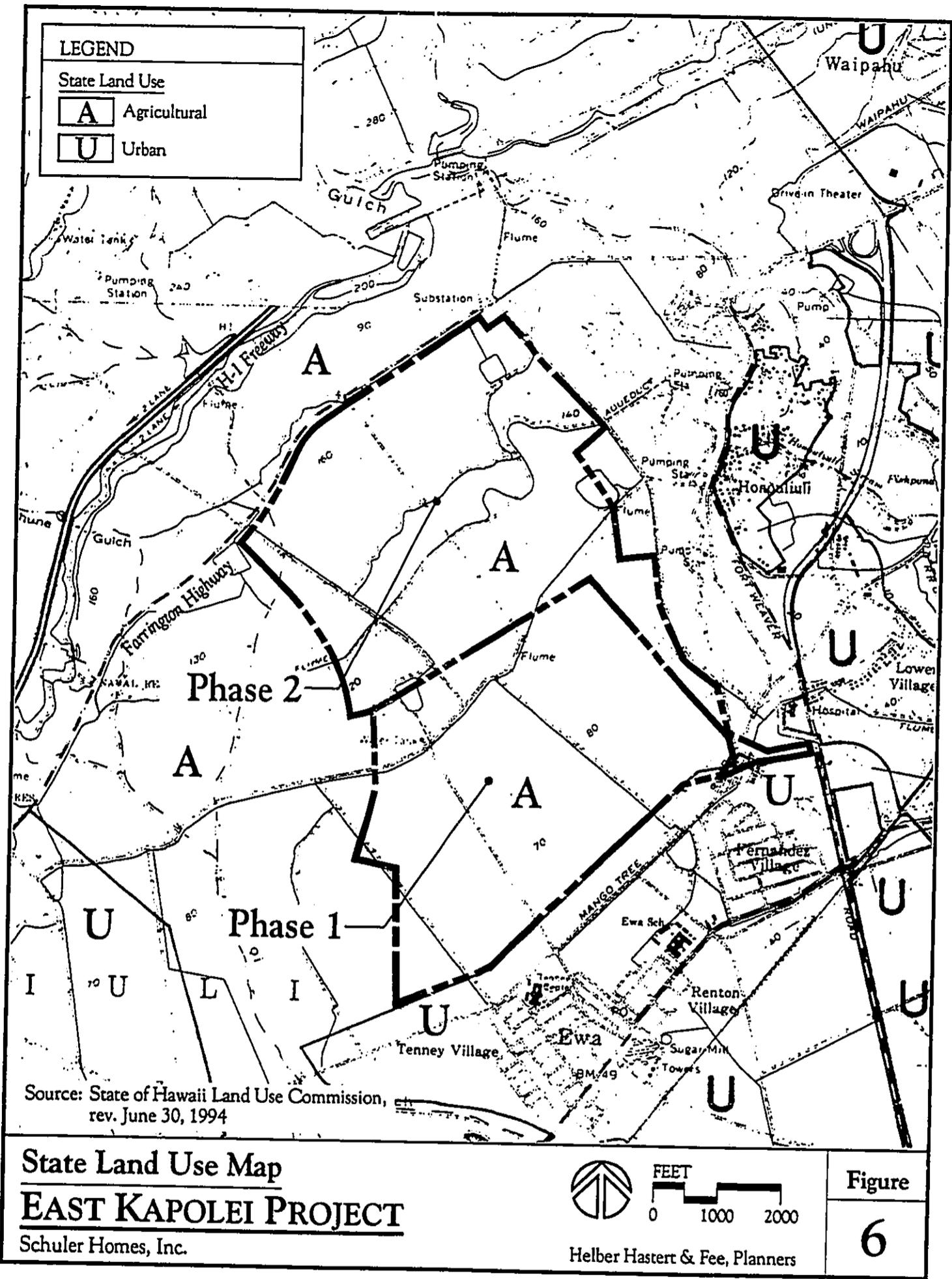
Implementing Action I.B.1.c.: *Promote the development of homes near jobs.*

Discussion: The project will provide residential opportunities in the East Kapolei area of the second city, to support ongoing efforts to close the gap between living and work areas. Both the State and City and County have plans to develop public services and expand employment centers in Kapolei-Ewa to support the second city concept.

3.2.3 State Land Use Law

All lands in the State have been classified in one of four land use districts (Urban, Rural, Agricultural and Conservation) by the State Land Use Commission, pursuant to Chapter 205, HRS. Both the Phase 1 and 2 portions of the East Kapolei project area are currently in the Agricultural district (Figure 6). A petition for a Land Use District Boundary Amendment was filed in September 1994 by the Governor's Office of State Planning which included the 500-acre Phase 1 portion of the project (Docket No. A94-708). A petition to urbanize the 556-acre Phase 2 portion will be submitted by Schuler Homes, Inc. in the near future.

The State Land Use Commission Rules, adopted October 1986, require that an application for a boundary amendment show that it is "reasonable, not violative of Section 205-2[HRS] and consistent with the policies and criteria established pursuant to Sections 205-16, 205-17 and 205A-2, HRS." (Hawaii Land Use Commission Rules, Section 15-15-77). In reviewing petitions for reclassification of district boundaries, the Commission must



specifically consider four criteria. The criteria are presented below, in italics, followed by a brief discussion of each criterion.

(1) *The extent to which the proposed reclassification conforms to the applicable goals, objectives and policies of the Hawaii State Plan and relates to the applicable priority guidelines of the Hawaii State Plan and the adopted functional plans;*"

Discussion: The project conforms to most applicable goals, objectives and policies and the guidelines of the State Functional Plans. Because of their competing nature, the project is not necessarily consistent with all policy areas.

(2) *The extent to which the proposed reclassification conforms to the applicable district standards.*

Discussion: The applicable standards for the Urban District are found in Section 15-15-18 of the Land Use Commission Rules. The project is consistent with the urban standards, including the area's "city-like" concentration of people and other related land uses; and proximity to employment centers. Services such as sewers, water, sanitation, schools, parks and police and fire protection are or will be available to serve the project. The Ewa-Kapolei area has been designated as a primary future urban growth center on State and County General Plans.

(3) *Impact on Areas of Statewide Concern*

Discussion: There are no threatened or endangered species, or historic or archaeological resources within the project area. Although the site is on prime agricultural land, present sugar cultivation will be terminating in 1995, for reasons unrelated to the project. The project is being proposed by a private development team, and no federal, state or county funds are being sought. The development of up to 10,000 residential units will provide housing opportunities for all income groups, including 60 percent offered at affordable prices.

(4) *In establishing the boundaries of the districts in each County, the commission shall give consideration to the General Plan of the County in which the land is located.*

Discussion: The Honolulu General Plan, discussed in Section 3.3 below, provides a general population distribution for the year 2010 for each of the Development Plan areas on Oahu. A population policy of the General Plan is to encourage development within the secondary urban center at Kapolei and to meet housing needs not readily provided in the primary urban center. The project is consistent with these population policies of the General Plan.

3.2.4 Environmental Impact Statements, Chapter 343, Hawaii Revised Statutes (HRS)

Section 343-5 (a)(6), HRS notes that the provisions of Chapter 343 apply to "any amendment to existing county general plans where the amendment would result in designations other than agriculture, conservation or preservation..." A State Attorney General opinion (Opinion No. 85-30) has broadened the scope of the definition of county general plans to include "...non-county initiated actions which propose amendment or change to a county's planning documents, however denominated, and development plans or otherwise, and which would result in a designation other than agriculture, conservation or preservation."

The action requested by this application will result in an amendment to the Ewa DP Land Use Map from the agricultural designation to the Low-Density Apartment, Parks and Recreation, Commercial and Public and Quasi-Public designations. As such, the provisions of Chapter 343 apply to the project. By letter dated November 10, 1994, the City Planning Department ("accepting agency") notified the Office of Environmental Quality Control (OEQC) that it had determined that an Environmental Impact Statement (EIS) was required for the proposed subject project. Notice of this determination was published in November 23, 1994 edition of the OEQC Bulletin. The publication of this notice began a 30-day public review period which ended on December 23, 1994.

A list of agencies, organizations and individuals consulted during preparation of the Draft EIS is found in Chapter 13 of this document. The chapter also contains reproductions of written comments on the EIS Preparation Notice and the applicants responses to the comments.

Chapter 14 provides a list of agencies, organizations and individuals consulted during the Final EIS preparation process. Reproductions of written comments in response to the DEIS, as well as response letters, are included.

3.2.5 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. The site lies within the State's Coastal Zone Management Area, which includes all lands within the State with the exception of forest reserves. Potential impacts to the coastal zone relate to storm drainage and wastewater disposal. Impacts resulting from project storm drainage will be mitigated by compliance with National Pollutant Discharge Elimination System (NPDES) permit

conditions. Wastewater generated from the project will be appropriately treated at the municipal Honouliuli wastewater treatment plant prior to deep ocean discharge.

Special Management Area guidelines are found in Part II of the same chapter. The site lies approximately 2.6 miles from the coastline (0.75 miles from Pearl Harbor) at its nearest point, and is well outside the City and County's Special Management Area. A Special Management Area use permit is not required.

The project's conformance with applicable policies and objectives of the Coastal Zone Management Program is discussed below:

Recreational Resources

Objective: *Provide coastal recreational opportunities accessible to the public.*

Discussion: The project will provide two 10-acre park sites and one 25-acre district park, all of which will be dedicated to the City and County of Honolulu. The total 45 acres exceeds the City and County Park Dedication Ordinance requirements for this type of development. The project will not have an impact on ocean recreational resources.

Scenic and Open Space Resources

Objective: *Protect, preserve and where desirable, restore or improve the quality of coastal scenic and open space resources.*

Discussion: The project will alter the visual resources along Farrington Highway, the H-1 Freeway and from the Ewa Villages and makai areas. Present agricultural uses and open space will diminish as new urban uses are developed. The design and landscaping of the proposed development will minimize adverse visual impact. Setbacks and landscaping will be provided along the spine access road, the proposed North-South Road and Farrington Highway. The two neighborhood parks and 25-acre district park will provide additional open space. Buildings will be no higher than three stories.

Economic Uses

Objective: *Provide public or private facilities and improvements important to the State's economy in suitable locations.*

Discussion: The East Kapolei residential project is appropriately located in the "second city" of Kapolei, which has been identified for future urban growth and development. The project will not have an adverse impact on the coastal zone.

Coastal Hazards

Objective: *Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion and subsidence.*

Discussion: The project structures and drainage system will comply with all flood zone criteria. The site is not within the coastal high hazard area. The developer will provide warning sirens and siren support infrastructure in the project area, in consultation with State Civil Defense. Public structures, such as the elementary schools, will be surveyed by State Civil Defense for possible use as public shelters.

3.3 City and County of Honolulu

3.3.1 General Plan

The General Plan for the City and County of Honolulu was adopted in 1977 and has been subsequently amended, most recently in 1992. The Plan is a statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of Oahu. The Plan is also a statement of broad policies which facilitate the attainment of the objectives of the plan.

Population

A population policy of the General Plan is to "encourage development within the secondary urban center at Kapolei and the Ewa and Central Oahu urban-fringe areas...to meet housing needs not readily provided in the primary urban center."

The following Table 2 compares the General Plan's population policy for Ewa with actual population projections for the year 2010.

**Table 2:
Year 2010 Population in Ewa: Policy vs. Projection**

	Share of Island Population	Year 2010 Population
General Plan Policy	12.0%-13.3%	119,900 to 132,900
Planning Dept. Forecast	9.3%	93,112
Difference		26,788 to 43,788

Source: Honolulu Planning Department 1994

As shown in the table, City planners project that the population of the Ewa area is likely to fall well below the guidelines established in the General Plan for 2010. This is due to the fact that new residential development in the area has been much slower than originally anticipated.

The East Kapolei project will result in about 10,000 additional residential units and up to 28,000 residents in the Kapolei/Ewa area at project build-out. The additional population generated by the project would bring the Ewa area population closer to the General Plan target goals, and also keep population growth in other areas of Oahu within General Plan limits.

Economic Activity

An economic activity objective is to "maintain the viability of agriculture on Oahu." A related policy is to "provide sufficient agricultural land in Ewa, Central Oahu...to encourage the continuation of sugar and pineapple as viable industries."

The East Kapolei site is comprised of agricultural land which is proposed for removal from cultivation regardless of the project. As a result, the development will not have an adverse impact on sugar cultivation or the sugar industry. The project will have an indirect positive impact on pineapple cultivation, as a portion of the site was part of a land exchange for 2,000 acres of pineapple land in Poamoho, Central Oahu. Without the land exchange, the project would likely have been developed on the Poamoho lands, resulting in significant disruption to ongoing pineapple cultivation there.

Housing

Housing objectives in the General Plan include the provision of decent housing for all the people of Oahu at prices they can afford and the provision of housing that is reasonable close to employment, recreation and commercial centers. The East Kapolei Project will include a mix of multi-family townhomes and condominium apartments, as well as single family homes. Approximately 60 percent of the units will be affordable to families earning up to 140 percent of County median income. The project's location in the Ewa-Kapolei "second city" ensures that support services, commercial areas and centers of employment will be located in close proximity for residents.

Transportation and Utilities

General Plan objectives include the provision of adequate roadways, water supplies and waste disposal, and the desire to maintain a high level of service for all utilities. The project master plan includes a spine road to serve as primary access until the State-proposed North-South Road is constructed. The new North-South Road, H-1 Freeway interchange and proposed improvements to Farrington Highway will ensure that roadways are provided to meet the area's regional transportation needs. The project will provide adequate water, wastewater, drainage, electrical and other utility services, which will be designed and constructed to meet all City and County standards.

3.3.2 Development Plan

The City and County of Honolulu's Development Plan (DP) program provides a relatively detailed framework for implementing General Plan objectives and policies on an area-wide basis. A total of eight DP areas have been established on Oahu, including the Ewa DP area where the project is located. The Ewa DP area encompasses the coral plain which stretches from the Central Oahu district boundary at Waipahu and Pearl Harbor, around the southwestern corner of the island, to Nanakuli. The Ewa Development Plan is codified as Ordinance No. 81-80, as amended, Revised Ordinances of Honolulu.

The DP Ordinances consist of four elements: Common Provisions (applicable for all DP regions), Special Provisions, DP Land Use Maps and DP Public Facilities Maps (for each DP region).

(1) Common Provisions

Section 24-1.3 of the DP Common Provisions describes the various land use categories found within each of the eight DP regions. The following describes the DP Common Provision land use categories requested in this application:

Low-Density Apartment

"Except as otherwise specified in the special provisions of each development plan, low-density apartment areas are for low-rise, low-density multi-family residential structures."

Parks and Recreation

"Parks and recreation include all public parks and recreational facilities, including beach parks, playgrounds, playfields, district parks, botanical gardens, zoos, golf courses and pedestrian malls as well as privately owned and/or operated park and recreational facilities which are provided as integral parts of developments."

Commercial

"Except as otherwise specified in the special provisions of each development plan, commercial areas are principally for business or commercial activities, in contrast to other types of economic activities. Limited accessory uses directly related to the principal uses may also be permitted but only on the same lot and not as a principal use."

Public and Quasi-Public

"Public and quasi-public areas include those areas designated for general governmental activities; schools, colleges and universities; airports, harbors, bus yards and other terminals; major health care facilities; major utility plants and substations; landfill sites, corporation yards and maintenance yards of public agencies; religious, social and social service institutions; and other public services."

Section 24-1.10 of the DP Common Provisions contains a set of social impact factors which are used in evaluating any proposed development as they pertain to the objectives of the general plan (see related discussion in Chapter 5).

(2) Special Provisions

The DP Special Provisions for Ewa set forth urban design considerations for development within the district for open space and public views. Open space urban design considerations state that the "visibility, preservation, enhancement and accessibility of open space areas as defined in Section 24-1.4 of the development plan common provisions shall be given high priority in the design of adjacent and nearby developments in Ewa..." The discussion of public views states "In order to promote pleasing and attractive living

environments in existing and new neighborhoods, mauka and makai views, and views of central Honolulu shall be protected whenever possible."

The proposed residential development will include landscaping and open space, and maintain views where possible. The proposed residential units will be set back from major roadways and will be no higher than three stories in height. Public open spaces including parks will be provided in accordance with Development Plan Common Provisions and Park Dedication Ordinance requirements.

Section 24-3.2(a)(3) and (4) of the Special Provisions for Ewa establish the following general residential height and density controls:

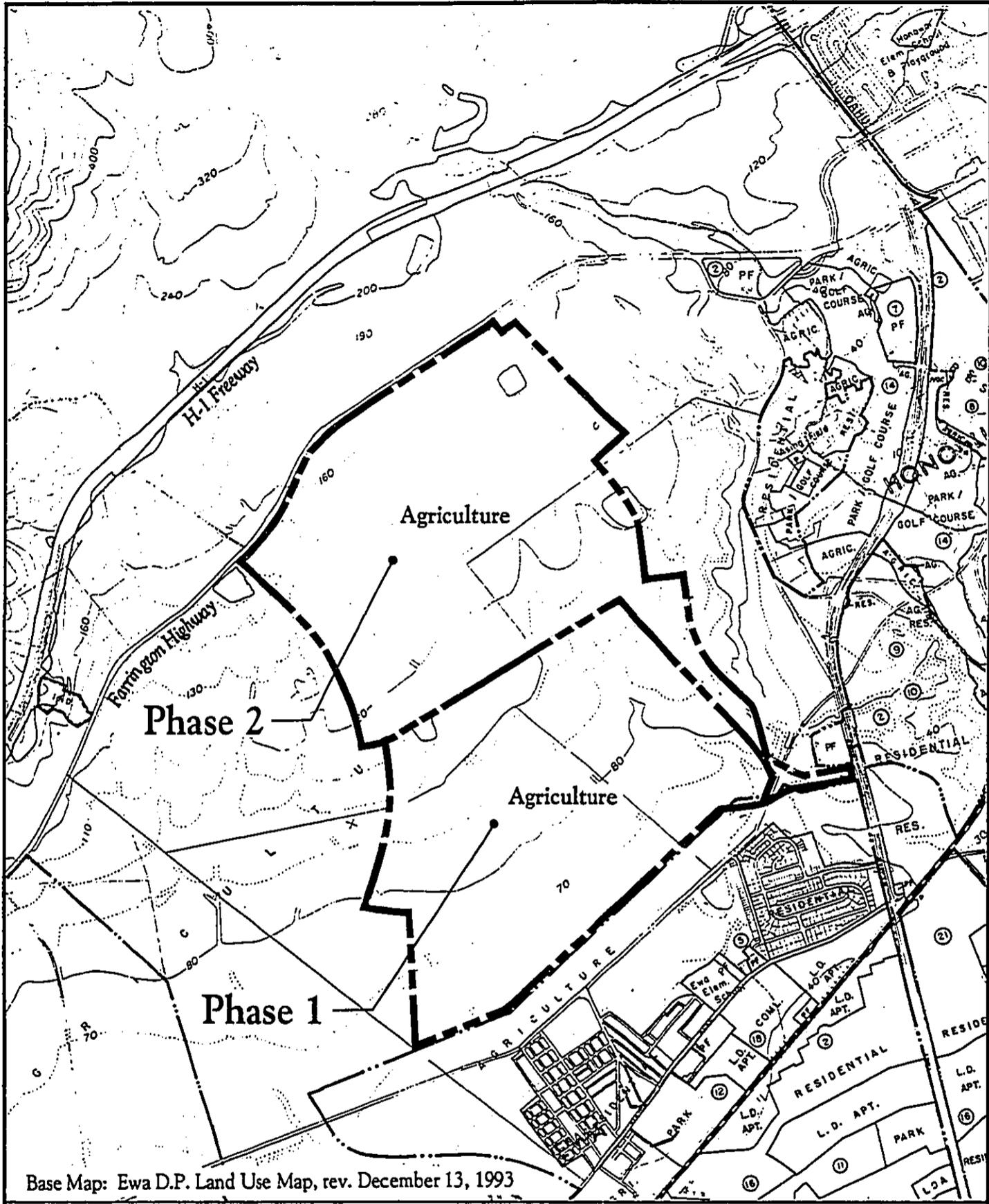
<u>DP Land Use</u>	<u>Height Limit (feet)</u>	<u>Density Limit (units/net acre)</u>
Residential	25	12
Low Density Apt.	30	30

As stated previously, the project will include both single family units at about 7 units/acre, townhomes at 11 units/acre and affordable multi-family homes in the 20 units/acre range. In order to maintain maximum design flexibility, the applicant has requested designation of all residential areas of the project within the Low Density Apartment category, which will allow three-story building heights and densities up to 30 units per net acre.

The applicant proposes the establishment of a new "Special Area" for the project district. Specific language is included in Appendix L.

(3) DP Land Use Map

The entire project area is designated Agricultural on the Ewa DP Land Use Map (Figure 7). The proposed DP Land Use Map designations based on the preliminary concept plan are presented in Figure 8. Requested land use designations are identified in Table 3 below.



Base Map: Ewa D.P. Land Use Map, rev. December 13, 1993

Existing D.P. Land Use Map

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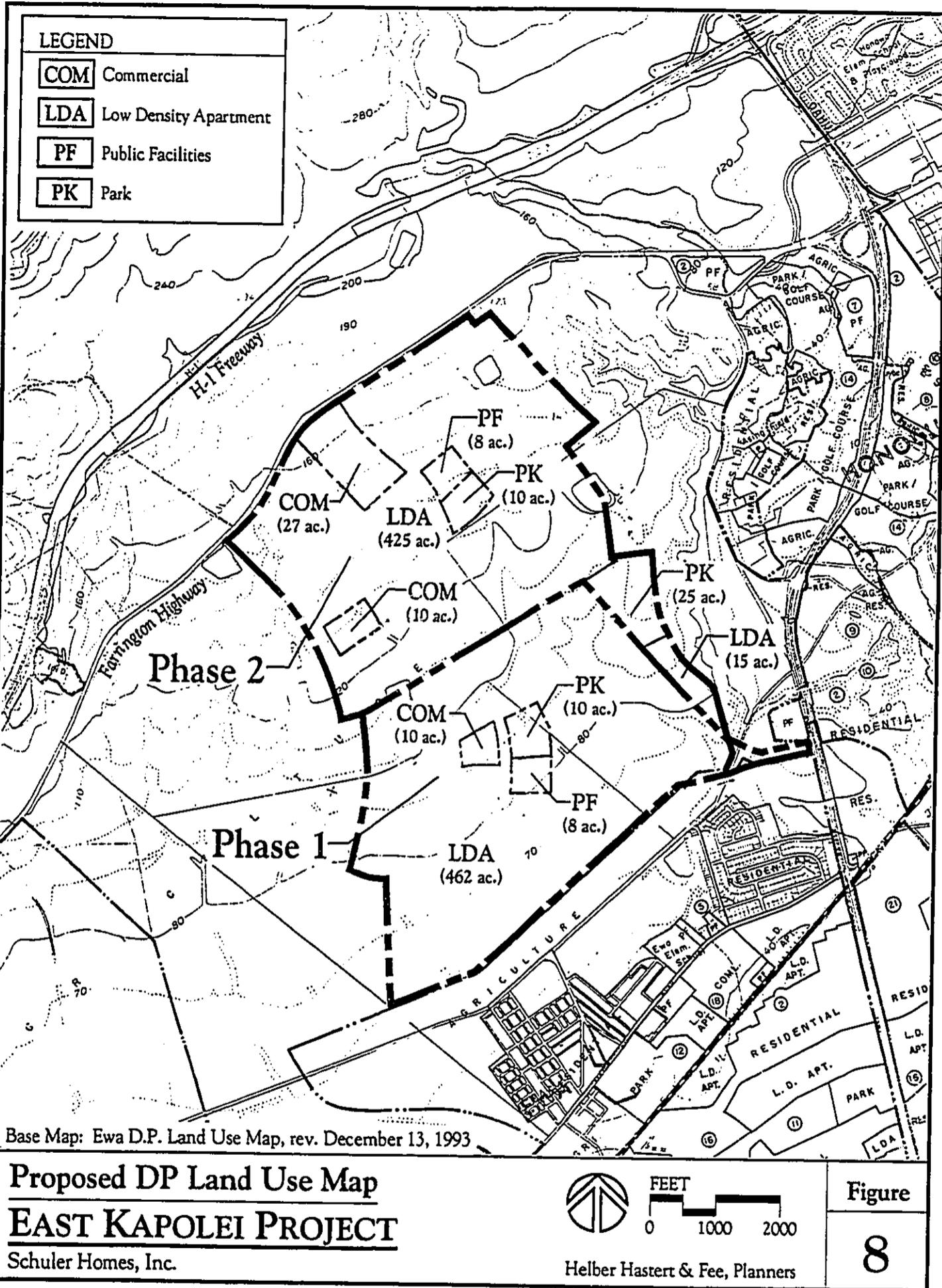
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Figure

7

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**Table 3:
Requested Development Plan Land Use Designations and Acreages**

<u>Land Use Category</u>	<u>Acres</u>		<u>Total</u>
	<u>Phase 1</u>	<u>Phase 2</u>	
Low Density Apartment	462	440	902
Commercial	10	37	47
Public and Quasi-Public	8	8	16
Parks and Recreation	10	35	45
Major Roads	<u>10</u>	<u>36</u>	<u>46</u>
Totals	500	556	1,056

(4) DP Public Facilities Map

The DP Public Facilities Map for Ewa (Figure 9) indicates planned and ongoing improvements to roadways, water and wastewater facilities in the vicinity of the area of application area. A description of the various proposals is summarized below. Public Facility map amendments necessary to support this application will be submitted in 1995.

Public Funding, Programmed Beyond Six Years

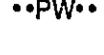
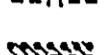
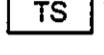
The Public Facilities map (revised May 23, 1994) indicates a north-south access road along the western boundary of the project area; intent to acquire rights-of-way for the North-South Road/H-1 freeway interchange and widening of Farrington Highway beyond six years. Hawaiian Electric Co. is constructing the Ewa Nui Substation next to the existing Ewa Substation across Farrington Highway from the northeast corner of the site.

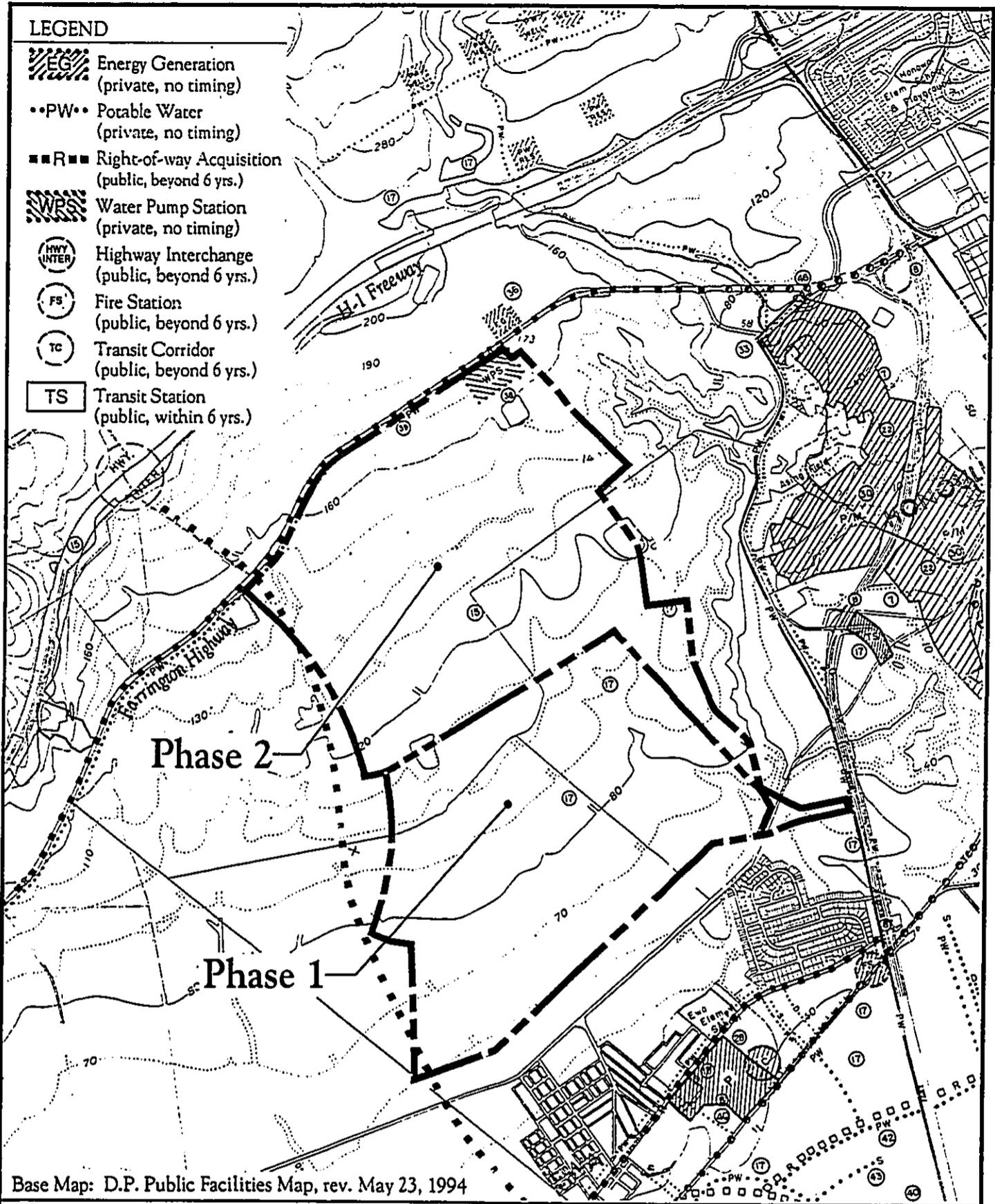
The alignment of the North-South road shown on the project concept plan varies slightly from the alignment shown on the DP Public facilities map. However, the concept plan alignment is consistent with the Department of Transportation Service's current plans for North-South road.

Private Funding

Construction of a water pump station/booster pump is presently underway by the Estate of James Campbell near the northeastern corner of Phase 2. The booster pump and proposed potable water transmission line along Farrington Highway will serve the City of Kapolei.

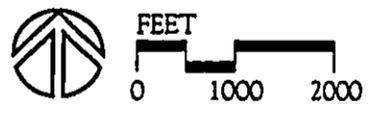
LEGEND

-  Energy Generation
(private, no timing)
-  Potable Water
(private, no timing)
-  Right-of-way Acquisition
(public, beyond 6 yrs.)
-  Water Pump Station
(private, no timing)
-  Highway Interchange
(public, beyond 6 yrs.)
-  Fire Station
(public, beyond 6 yrs.)
-  Transit Corridor
(public, beyond 6 yrs.)
-  Transit Station
(public, within 6 yrs.)



Base Map: D.P. Public Facilities Map, rev. May 23, 1994

D.P. Public Facilities Map
EAST KAPOLEI PROJECT
 Schuler Homes, Inc.



Helber Hastert & Fee, Planners

Figure
9

3.3.3 Honolulu Land Use Ordinance

According to the City and County of Honolulu Land Use Ordinance and Zoning Maps, the entire project area is zoned AG-1, Restricted Agricultural. An application for rezoning the Phase 1 area to support proposed residential development will be submitted to the City in 1995. Rezoning of Phase 2 will be sought at a later date.

3.3.4 Resolution No. 94-296

Resolution No. 94-296 was adopted by the Honolulu City Council on December 1, 1994. The resolution established a new objective and policies for storm water management of the City and County of Honolulu. The objective of the storm water management policy is to "achieve a net decrease in the volume and rate of storm water runoff, to increase infiltration to groundwater supplies, and to improve the quality of storm water entering surface and groundwater supplies and receiving water."

Its policies include:

1. No overall increase in the peak flow level and volume of storm water runoff into receiving waters designated water quality limited segments by the State Department of Health by requiring that "other new developments" achieve, where feasible, no increase in storm water runoff;
2. To encourage all levels of government, agencies and developers to employ methods of retaining or detaining storm water for gradual release into the ground, as the preferred strategy for the management of storm water;
3. To require, where feasible, permanent best management practices and engineering controls at developments to reduce the discharge of pollutants in runoff into the municipal storm sewer systems; and
4. To utilize, where feasible, any open space, including parking lots, landscaped areas, mini and community parks, and golf courses, private and public, to detain or infiltrate storm water flows to reduce their volume and runoff rates.

The East Kapolei project will be developing land within two drainage basins--Kaloii Gulch and West Loch. Alternatives to providing onsite detention/retention to meet the objectives of the resolution have been proposed and are currently under review. Should these proposals for offsite detention/retention be deemed unacceptable, onsite facilities will be developed to meet City and County of Honolulu requirements.

4.

ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE
IMPACTS: PHYSICAL ENVIRONMENT

CHAPTER 4
ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE IMPACTS:
PHYSICAL ENVIRONMENT

4.1 Climate

The Ewa area is relatively dry and one of the sunniest areas on Oahu. Rainfall averages just slightly over 20 inches per year. Average low temperatures range from about 60 degrees Fahrenheit in the winter to about 70 degrees in the summer. Average high temperature ranges from just under 80 degrees in winter to just under 90 degrees in the summer.

4.2 Geology and Topography

The two major land forms in the Ewa region are the Ewa Plain and the Makakilo upland. The H-1 Freeway and Farrington Highway are the general boundaries of the two land areas. The cinder cones, or *pu'u* along the Waianae Mountain Range form the peaks of that region: Manawahua, Kapuai, Makakilo, Palailai and Kapolei.

The Ewa Plain is an elevated coral reef covered by alluvium. Elevations vary from about 50 feet above mean sea level (msl) near the southern boundary at Barbers Point to 2,300 feet above msl at Puu Manawahua, the highest peak in the Ewa region.

The topography of the project area is relatively flat to gently sloping toward the ocean, with elevations ranging from 175 feet above mean sea level (msl) at the mauka (northern) end of the property to 55 feet above msl at the makai (southern) end. (see Figure 10). The site is generally flat with an overall mauka-makai grade of about 1.4 percent.

4.3 Soils

4.3.1 U.S. Soil Conservation Service

According to the U.S. Department of Agriculture, Soil Conservation Service, soils within the project area include Kunia silty clay, 0-3% slopes (KyA); Honouliuli clay, 0-2% slopes (HxA); Waipahu silty clay, 0-2% slopes (WzA); Waipahu silty clay, 2-6% slopes (WzB); and Ewa silty clay loam, 3-6% slopes (EaB). The most extensive soil type is HxA (approximately 60 percent) followed by KyA (approximately 20 percent). These soil types are described below and are shown in Figure 11.

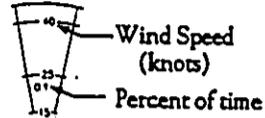
Kunia silty clay, 0-3% slopes (KyA)

The Kunia series consists of well-drained soils on upland terraces and fans on the island of Oahu. These soils developed in old alluvium. Kunia silty clay, 0-3% slopes occurs on broad smooth slopes.

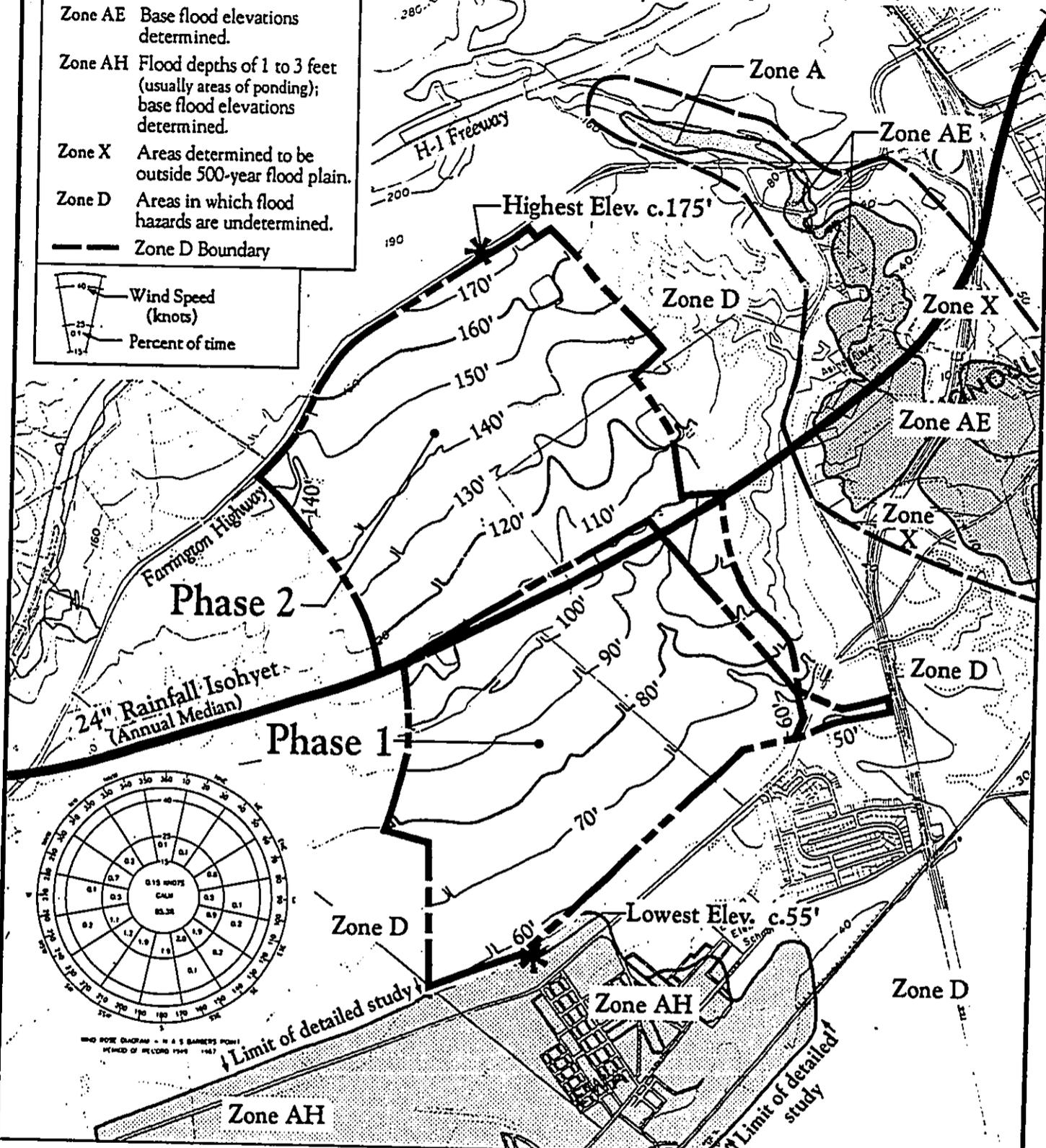
LEGEND

- Zone A No base elevations determined.
- Zone AE Base flood elevations determined.
- Zone AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- Zone X Areas determined to be outside 500-year flood plain.
- Zone D Areas in which flood hazards are undetermined.

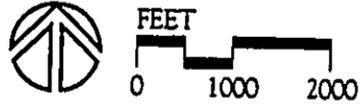
--- Zone D Boundary



Source:
Flood Insurance Rate Maps
Panel Number 150001: 0110C, 0130C, 0135C
(Revised September 28, 1990)



Environmental Conditions
EAST KAPOLEI PROJECT
Schuler Homes, Inc.

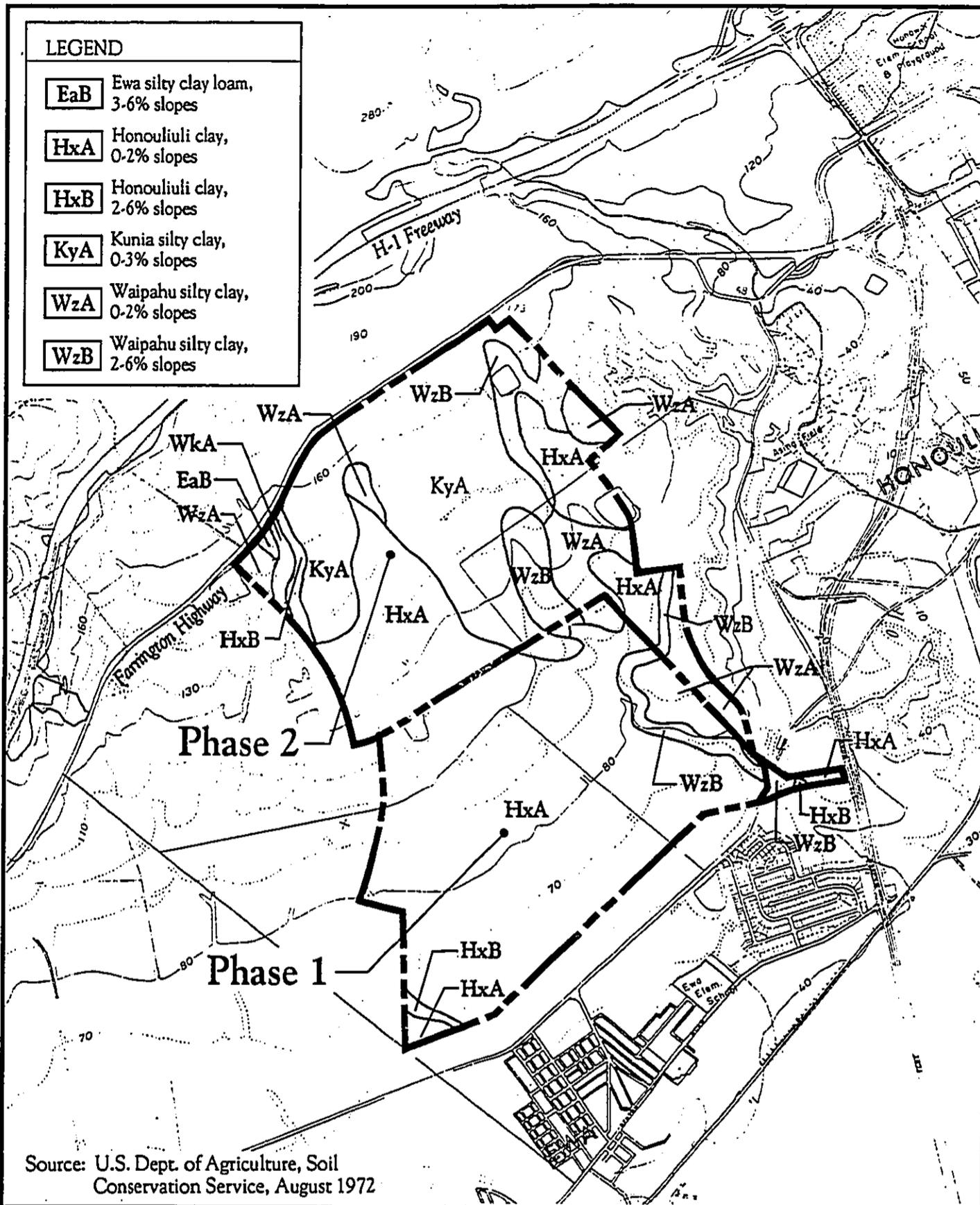


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Figure
10

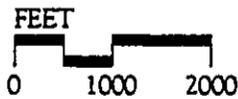
LEGEND

- EaB** Ewa silty clay loam,
3-6% slopes
- HxA** Honouliuli clay,
0-2% slopes
- HxB** Honouliuli clay,
2-6% slopes
- KyA** Kunia silty clay,
0-3% slopes
- WzA** Waipahu silty clay,
0-2% slopes
- WzB** Waipahu silty clay,
2-6% slopes



Source: U.S. Dept. of Agriculture, Soil Conservation Service, August 1972

SCS Soil Survey Map
EAST KAPOLEI PROJECT
 Schuler Homes, Inc.



Figure

11

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In a representative profile the surface layer is dark reddish-brown silty clay about 22 inches thick. The sub-soil, 40-71 inches thick, is dark reddish-brown silty clay and silty clay loam that has subangular blocky structure. The substratum is dark reddish-brown gravelly silty clay. Permeability is moderate, runoff is slow and erosion hazard no more than slight.

Honouliuli clay, 0-2% slopes (HxA)

This soil series consists of well-drained soils on coastal plains in the Ewa area of Oahu. This type of soil comprises the majority of the project area. Honouliuli clay soils developed in alluvium derived from basic igneous material. Permeability is moderately slow, runoff is slow and the erosion hazard no more than slight. Workability is slightly difficult because of the very sticky and very plastic clay. The shrink-swell potential is high.

Waipahu silty clay, 0-2% slopes (WzA)

This soil series consists of well-drained soils on marine terraces on Oahu. WzA occurs on dissected terraces adjacent to the ocean. Permeability is moderately slow, runoff is slow to very slow and the erosion hazard is none to slight.

Waipahu silty clay, 2-6% slopes (WzB)

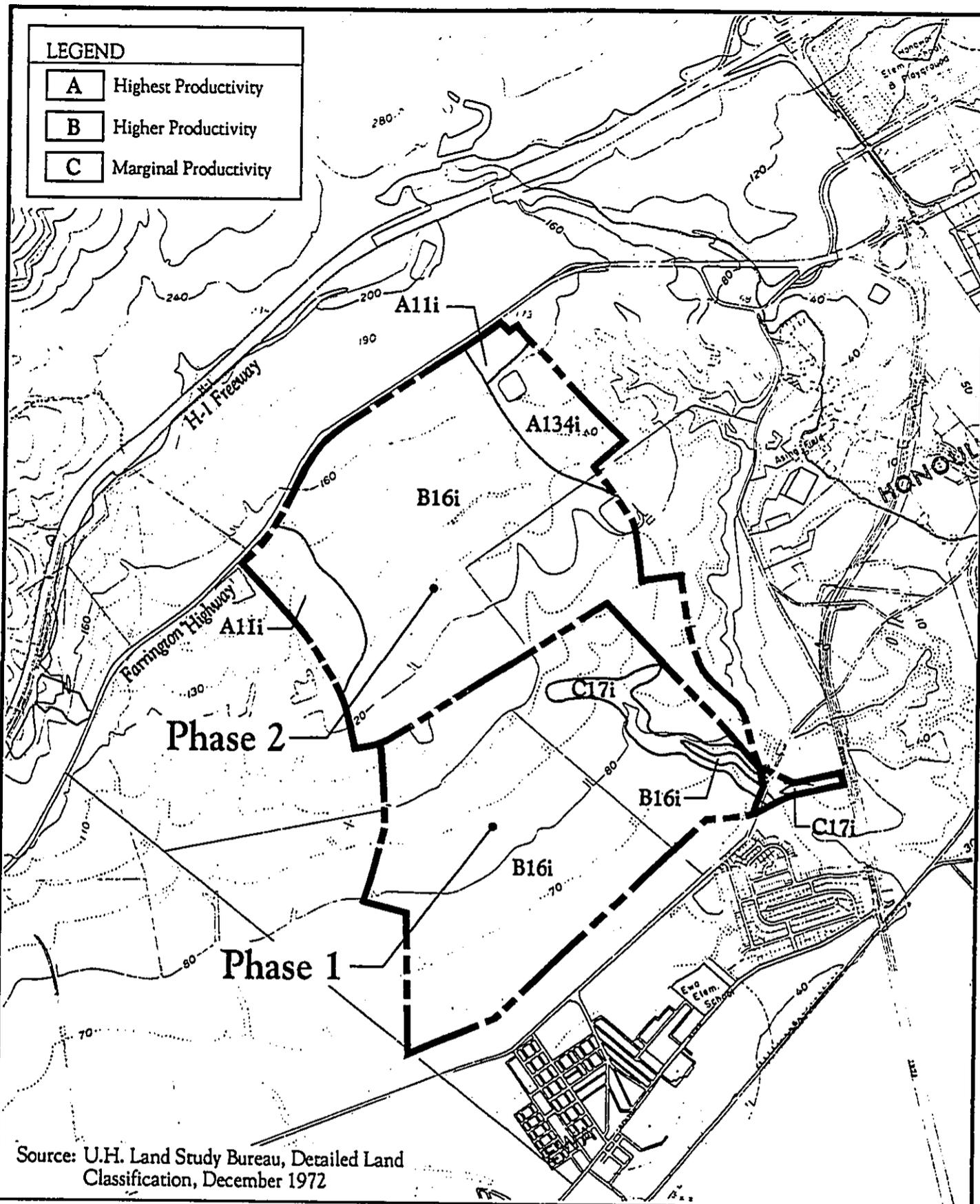
This soil is nearly level and occurs on dissected terraces adjacent to the ocean. Permeability is moderately slow, runoff is slow or very slow and the erosion hazard is none to slight.

Ewa silty clay loam, 3-6% slopes (EaB)

This soil occurs on alluvial fans and terraces. Permeability is moderate, runoff is slow and the erosion hazard slight.

4.3.2 U.H. Land Study Bureau Detailed Land Classification

The University of Hawaii Land Study Bureau's (LSB) Detailed Land Classification classifies soils by land type in which classifications are provided for an overall crop productivity rating, with and without irrigation, and for selected crop productivity ratings for seven crops. LSB overall ratings range from A to E, with A being the best. According to the classification, most of the property is Class B or prime agricultural lands, with some Class A land near the western and eastern portions of the Phase 2 area. There are patches of Class C lands within gully areas. The LSB classifications are shown in Figure 12.

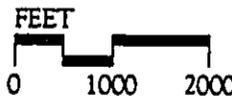


Source: U.H. Land Study Bureau, Detailed Land Classification, December 1972

UH LSB Soil Productivity Ratings

EAST KAPOLEI PROJECT

Schuler Homes, Inc.



Figure

12

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4.3.3 Agricultural Lands of Importance to the State of Hawaii (ALISH)

The Agricultural Lands of Importance to the State of Hawaii (ALISH) land classification system was developed by the State Department of Agriculture (1977). The ALISH system identifies three broad classes of lands, including "Prime Agricultural Land," "Unique Agricultural Land" and "Other Important Agricultural Land." As shown in Figure 13, the entire project area is designated "Prime Agricultural Land," defined as land best suited for the production of food, feed, forage and fiber crops...Prime agricultural land gives the highest yields with the lowest inputs of energy or money and with the least damage to the environment."

4.4 **Flooding**

Existing Conditions

According to the Flood Insurance Rate Maps (Federal Emergency Management Agency 1990) shown in Figure 10, the project area is designated Zone D, areas in which flood hazard is undetermined. The project site is not located within the coastal high hazard area.

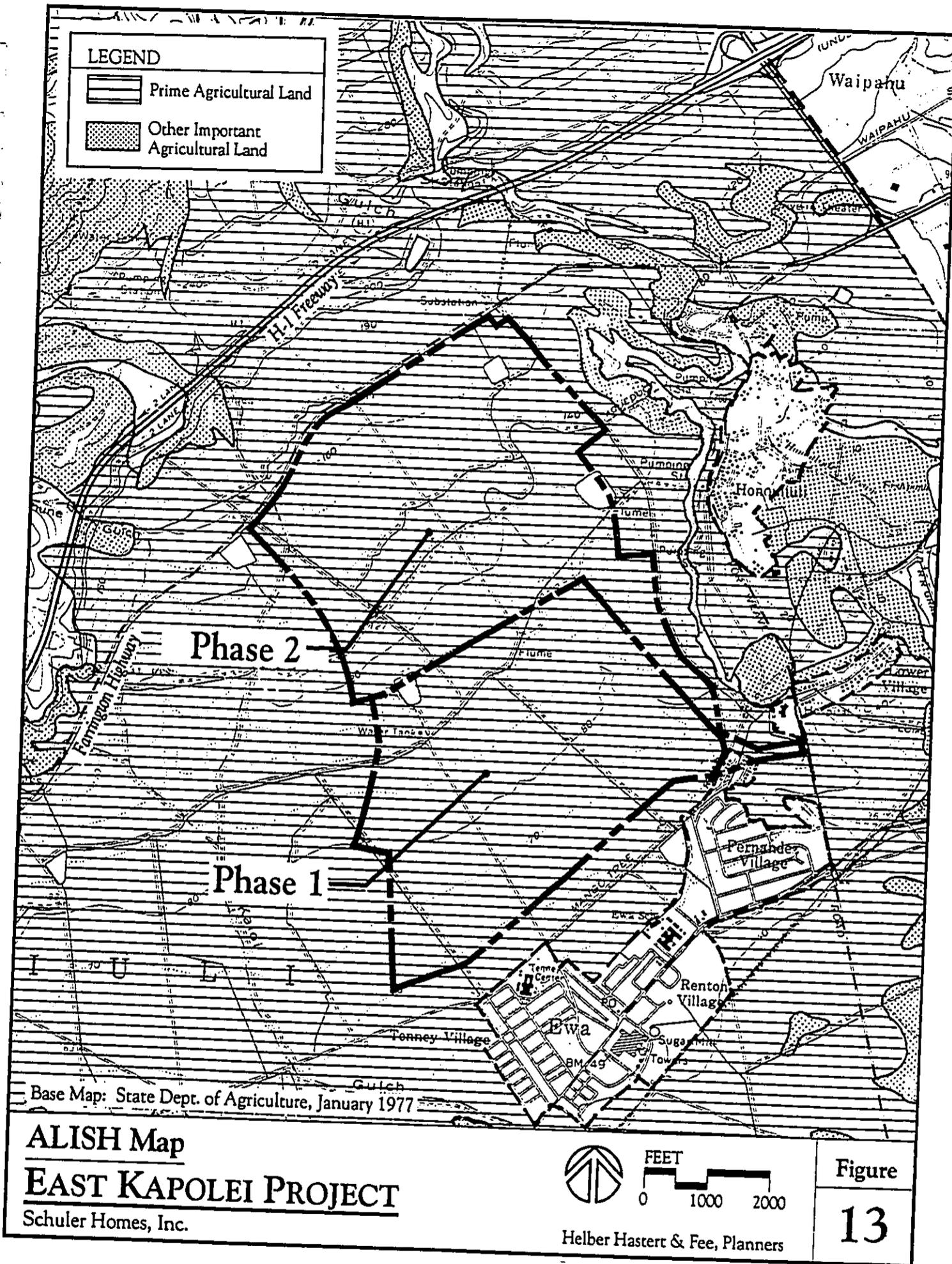
About one-third of the project area is located in the Kaloι Gulch drainage basin. The "gulch" has inadequate capacity to handle peak discharges, and during these times, water sheetflows across canefield and vacant lands and percolates into the caprock aquifer via ground depressions. (PBR Hawaii, July 1994). The balance of the site lies in the West Loch watershed which drains into the West Loch of Pearl Harbor. Drainage conditions and improvements are discussed in Section 6.4.

Probable Impacts

As discussed in Section 6.4, Drainage, the project drainage system will be designed to minimize on-site and off-site flooding and downstream flood hazards.

4.5 **Groundwater Resources**

There are two groundwater aquifers located in the project region: the deeper (and higher quality) Waianae volcanic aquifer and the overlying (mostly brackish to salt water) coral aquifer. The project area is located within the Pearl Harbor Ground Water Control Area (GWCA) and therefore, groundwater withdrawals are regulated by the State Water Commission. Although the project area is located mauka of the Underground Injection Control Line, the project is not expected to cause groundwater contamination of potable water sources. (PBR Hawaii, July 1994).



4.6 Flora

Existing Conditions

A biological survey of the site was conducted by Evangeline Funk, Ph.D. (July, 1994), and is included as Appendix H. No proposed or listed, threatened or endangered species were found during field surveys of the site. Three vegetation types can be found in the study area: 1) ruderal or wayside vegetation, 2) Koa haole/grass, and 3) agricultural fields. None of these vegetation types contained endemic (native only to Hawaii) or indigenous (native to Hawaii and other places) plant species in great numbers. The three indigenous plants found on site, Ilima (*Sida fallax* L.), Popolo (*Solanum americanum* Mill.) and Akulikuli (*Sesuvium portulacastrum* (L.) are still very common in the coastal lowlands of most of the Hawaiian Islands. The remaining botanical resources on the site are introduced plants, most of which are considered to be weeds.

Probable Impacts

It was concluded that development of the site will not have a significant impact on the flora of the area. The study noted that the project area has been under cultivation for many years, and as a result, the native plant community has completely disappeared. The type of vegetation found on the site is common throughout the islands.

4.7 Fauna

Existing Conditions

Appendix H also includes a fauna survey report for the project site. Only one species of mammal was found during the field survey, a Mongoose (*Herpestes auropunctatus*).

Fourteen species of birds were found on and around the study site. No threatened or endangered species were found. The identified birds included White-eyes (*Zosterops japonicus*), house sparrow (*Passer domesticus*), common waxbill (*Estrilda astrild*), chestnut mannikin (*Lonchura malacca*), nutmeg mannikin (*Lonchura punctlata*), red crested cardinal (*Paroaria coronata*), northern cardinal (*Cardinalis cardinalis*), bulbul (*Pycnonotus cafer*), cattle egret (*Bubulcus ibis*), house finch (*Carpodacus mexicanus*), spotted dove (*Streptopelia chinensis*), zebra dove (*Geopelia striata*), rock dove (*Columba livia*) and common myna (*Acridotheres tristis*).

Because the entire site has been extensively modified by agricultural activities, it has almost no value as native bird habitat. However, it does support a variety of non-native species. The two most important bird observation areas were along the flumes and water ways and in the Koa haole/grass vegetation type found along Kalo Gulch. The flumes and ditches are favored because they provide a source of water in this otherwise parched area. The Koa haole/grass vegetation provides a rich source of food for seed eating birds.

Probable Impacts

The project will not have an impact on threatened or endangered species of terrestrial fauna.

4.8 Air Quality

An analysis of potential air quality impacts was conducted by J. W. Morrow, Environmental Management Consultant (October 1994), and is included as Appendix I. The purpose of the study was to assess the impact of the proposed development on air quality on a local and regional scale; particularly, the project's ability to generate traffic and the resultant impact on air quality..

Existing Conditions

There are no State Department of Health air monitoring sites in the immediate vicinity of the project site. The nearest monitoring stations are at Pearl City and Barbers Point, which measure particulate matter. Particulate matter levels are well below the State standard levels. Likewise, monitoring results from the Department of Health building in downtown Honolulu indicates compliance with all other standards. Air quality at the project area was expected to be comparable or somewhat better, given the site's more rural location.

Probable Impacts

Short-Term Impacts. The principal source of short-term air quality impacts will be construction activity, including construction vehicle emissions and particulate emissions associated with earth moving operations. The fine soils and dry climate found in the project area suggest an increased potential for fugitive dust emissions. During construction, there will also be off-site air quality impacts due to the operation of concrete and asphalt batching plants needed for construction.

Operational Period Impacts. Potential operational-period impacts are limited to vehicular emissions and indirect impacts associated with electrical power generation (fossil-fuel emissions) and solid waste disposal (H-POWER combustion emissions). Air quality impact was evaluated based on traffic projections for the years 2005 and 2011, with and without the project. The analysis indicates there is some potential for exceeding the state's one-hour carbon monoxide (CO) standard in close proximity (i.e., within 10-meters) of planned intersections along the proposed North South Road during both a.m. and p.m. peak traffic hours. Even without the project, exceedances are predicted during the a.m. peak hour at the intersection with Farrington Highway. No exceedances of the federal CO standard are predicted.

Off-site, electrical power demands and solid waste disposal are not expected to have a significant impact on air quality.

Mitigation

Appropriate dust control measures will be employed during construction activities to minimize potential for fugitive dust emissions. Dust control could be accomplished through frequent watering of unpaved roads and areas of exposed soil. Landscaping at the earliest time possible will also mitigate fugitive dust impacts.

As noted in the study, possible exceedances of state carbon monoxide standards are predicted for 2005 and 2011. Factors which mitigate against this being a serious concern for the project are that the predicted exceedances were found only very close to the intersection (within 10 meters of the roadway) and only at particularly receptor locations. Also, the probability of "worst case" conditions occurring and persisting for one to eight hours is low. Potential automobile CO impacts will be mitigated by setting back residential uses beyond 10 meters of the proposed North South Road intersections.

Appropriate energy conservation measures (i.e., use of solar water heaters, heat pumps, energy-efficient design, etc.) should be considered to minimize electrical power demands. Recycling and composting measures should be considered to minimize solid waste generation.

4.9 Noise

Existing Conditions

An Environmental Noise Assessment was completed for the project by Darby and Associates (September 1994). That study, included as Appendix F, found that the project site is currently exposed to low ambient noise levels of approximately 48 to 55 dBA, which is typical of rural areas. The dominant noise sources include wind in foliage and occasional distant aircraft flyovers.

Probable Impacts

Construction Noise. Short-term, temporary noise impacts will be generated during project construction by earth moving equipment such as bulldozers and diesel-powered trucks. The increase in traffic as a result of the project will increase traffic-related noise along Farrington Highway and along the proposed North-South Road. The proposed residential areas could be impacted by this traffic noise.

Traffic Noise. The Noise Assessment estimated traffic noise increase as a result of the project. The projected future (2005 and 2011) traffic noise increases during peak traffic along Farrington Highway due to the project were less than or equal to 2.5 dB. Therefore, the traffic noise level increase may be perceptible by some people at noise sensitive locations along Farrington Highway.

The proposed residential areas may also be impacted by traffic noise. Residences along the interior project arterials should be exposed to noise levels less than 65 dBA, which corresponds to the federal Department of Housing and Urban Development's (HUD) "Acceptable" site criteria. Residences along Farrington Highway and North-South Road may be exposed to future day-night average sound levels (Ldn) greater than the HUD recommended limit of 65 dBA due to traffic noise if located too close to the roadways. Table 4 provides "worst case" noise contour interval setbacks along these roadways.

**Table 4:
Estimated Minimum Setback Distances for Residences***

Location	Roadway	HUD	HUD		HUD
		"Acceptable" Site	"Normally Unacceptable" Site	"Unacceptable" Site	"Unacceptable" Site
		Ldn < 65	Ldn 65-70	Ldn 70-75	Ldn > 75
A	Farrington Hwy	>219'	219 to 74'	74' to ROW	--
B	Farrington Hwy	>299'	299 to 104'	104' to ROW	--
D	North-South Rd	>220'	220 to 80'	80' to ROW	--
E	North-South Rd	>295'	295 to 98'	98' to ROW	--

Source: Darby & Associates, September 1994

*For multi-story, naturally ventilated residences. Based on HUD traffic noise criteria. Noise based on distance from right-of-way (ROW) centerline and 6.5 feet HUD requirement between noise level prediction location and the building setback line.

Aircraft. The project site is within approximately four to eight miles of Honolulu International Airport/Hickam AFB and Barbers Point Naval Air Station. Due to the distance from the site, the overall day-night average sound level (Ldn) due to air traffic will be less than 55 dBA, which is compatible with State Department of Transportation residential guidelines. However, infrequent aircraft flyovers may at times be audible at the site.

Sugarcane Agriculture. Sugarcane agriculture involves certain periods of intense activity involving noise generating activities such as land preparation, harvesting and hauling. Lands to the east and west of the project area are presently in sugarcane. If nearby sugarcane operations continue beyond the completion of the proposed project, noise from these agriculture activities may impact nearby noise sensitive residential areas.

Mitigation

During construction, all Department of Health noise regulations and conditions for construction activities will be followed. Construction equipment and on-site vehicles requiring an exhaust of gas or air will be equipped with mufflers. Construction-related blasting, if required, will utilize appropriate blast design techniques to minimize noise impacts on populated areas.

Recommended traffic noise mitigation along Farrington Highway and North-South Road would include properly constructing a sound barrier along the roadway, such as a noise barrier wall and/or a landscaped earth berm, which clearly blocks the line-of-sight to the traffic. For those residential units in areas with noise above the "acceptable" (<65 Ldn) levels, recommended mitigation includes air-conditioning to allow closed windows, and, in naturally ventilated rooms, by installing carpeting, louvered closet doors and absorptive ceiling tiles.

4.10 Visual Resources and Open Space

Existing Conditions

At present, the project area is cultivated in sugar cane. The property is visible but not easily defined from the H-1 Freeway and Farrington Highway. When traveling northbound, the project area is visible from the Ewa Villages golf course and residential areas. Major viewplanes from the site are toward downtown Honolulu and Diamond Head to the southeast and toward the Waianae Mountain Range to the north of the site.

Probable Impacts

Development of the project will gradually and irretrievably alter the visual resources along Farrington Highway, the H-1 Freeway, and from the Ewa Villages and makai areas. The present agricultural uses/open space will diminish as new urban uses are developed.

Due to the relatively flat topography, views of Honolulu will be obstructed by multi-story development for all parcels except those along the property's fringes. From areas makai of the project site, major views of the Waianae Range should not be obstructed by the development.

Mitigation

The design and landscaping of the proposed development will minimize adverse visual impacts. Setbacks and landscaping will be provided along the spine access road, the proposed North-South Road and Farrington Highway. Two 10-acre neighborhood parks and a 25-acre district park will be included to provide additional open space. The project will avoid visually intrusive development, with buildings no higher than three stories.

4.11 Historic/Archaeological Resources

Existing Conditions

Because of the extensive, agriculture-related land modification of the area during the last 70 to 80 years, no archaeological or historic resources are known to exist on site.

The earliest detailed map of the area shows no habitation closer than the western edge of West Loch in the vicinity of Papapahu Point. The Monsarrat survey map of 1878 documents substantial settlement at the "Honolulu Taro Lands" in the Papapahu Point area, and it seems clear that in early historic times, that was the focus of the population of the Honouliuli ahupua'a. The amenities of that area, such as fishponds, taro lo'i, shellfish collecting and salt drying would have focused population there in prehistoric times, and the name of that place must have secondarily come to apply to the entire ahupua'a.

The earliest archaeological study in Honouliuli by McAllister (1933) noted, "The Ewa coral plains contain many sites throughout the area. The greatest extent of old stone walls, particularly near the Puuloa Salt Works, belongs to the ranching period of about 75 years ago [circa 1858]." The only other early documented site in the vicinity was a heiau on Puu Kapolei. (PBR Hawaii, September 1994).

The Oahu Railway and Land (OR&L) right-of-way (ROW) is an historic resource in the general vicinity of the project area. The 40-foot wide ROW was constructed in the late nineteenth century and extends for 15 miles from near Kahe Point to just mauka of NAS Barbers Point, and then follows Renton Road to Honouliuli. Most of the land is owned by the State Department of Transportation. (Department of Land and Natural Resources, July 1994).

Probable Impacts

No significant impact on historic or archaeological resources is anticipated. The Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD) has concurred that the project will have "no effect" on historic sites (Hibbard, September 22, 1994--Appendix C).

The project will comply with all notification and stop work requirements if potentially historic or archaeological remains should be encountered during construction.

5.

ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE
IMPACTS: SOCIO-ECONOMIC ENVIRONMENT

CHAPTER 5
ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE IMPACTS:
SOCIO-ECONOMIC ENVIRONMENT

A Socio-Economic Impact Assessment for the project was completed by Community Resources, Inc. in November 1994 (Appendix E). That study examined population, demographic, employment and income characteristics and project impacts. The findings are discussed in the first four sections of this chapter.

5.1 Population and Potential Impact on Surrounding Communities

Existing Conditions

The Ewa area of the island of Oahu is comprised of many different and distinct communities, including the older communities of Ewa Beach and Ewa Villages, and the newer developments at Kapolei, Ewa Gentry and Makakilo. The average annual growth rate for the City and County of Honolulu's Ewa Development Plan (DP) area from 1980 to 1990 was 1.87 percent, and is forecast at about 4 percent between 1990 and 2010. In 1990, 42,983 people lived in Ewa, or about 5 percent of Oahu's population.

Future Without Project

State and City population policies have called for the development of a "second city" in Ewa with increased residential and commercial development. Population guidelines for the City and County DP areas reflect a policy of directing growth to Ewa, with slow growth or stable populations in other regions.

While much residential development is now occurring in Ewa, the region will not fully realize the objective of alleviating pressures of growth in other areas of Oahu by 2010, for three reasons:

- Central Oahu has developed more rapidly than Ewa;
- Some major Ewa developers have not met their announced construction schedules; and,
- Part of the housing slated for Ewa (in the Ko Olina and Ewa Marina projects) could be used by non-residents.

While some 28,876 housing units are proposed for development in Ewa, new units for Hawaii residents by 2010 are likely to number about 23,075. The above calculation follows the Market Assessment for this DEIS (Atwater 1994) in estimating a 15% delay in scheduled construction and subtracting 1,470 units likely to be used by non-residents. The figure used here is for the Ewa DP area only.

City and County Planning Department estimates of Ewa's 2010 population, if current trends continue, range from 93,112 (Honolulu Planning Department, April 1994) to 102,149 (Honolulu Planning Department, November 1994). These estimates are well below the General Plan guidelines.

While housing development has been slower than proposed, Ewa residents comment that housing development has far outstripped job creation and development of needed infrastructure and facilities. Planned public and commercial facilities will help to make Kapolei a regional center, if these are developed as scheduled.

Probable Impacts

Residential Population. The project will provide a mix of multi-family and single family housing and will increase the resident population of the area. By the year 2000, the project is expected to have over 6,000 residents in Phase 1. By 2010, the on-site residential population would be up to 24,500, including 14,000 in Phase 1 and 10,500 in Phase 2. At full build-out, the total population would be about 28,000 in both phases.

The project will house Oahu residents, and will not attract potential residents from off-island. The project's residential population will bring the Ewa DP area population to a point within the General Plan guidelines as indicated in Table 5 below:

**Table 5
Components of Ewa DP 2010 Population, With Project**

Recent Planning Department forecasts	93,100 to 102,100
Additional Population with Project	<u>24,500</u>
Ewa 2010 Population, with Project	117,600 to 126,600
General Plan Policy Guideline for Ewa	119,900 to 132,900

By helping to achieve the General Plan guidelines for Ewa, the project will also help to limit population growth in other areas.

Continuing population growth will bring to Ewa a customer base for proposed commercial developments and a citizenry needing planned improvements. Development of the project will add to the number of residents needing public facilities and services. In the short run, this may mean increased frustration over such problems as traffic congestion. In the long run, the greater the regional population, the more justification will exist for expensive infrastructure (such as the North-South Road) and for locating public services in Ewa.

De Facto Population. The project will have no effect on visitor population, as it has no facilities to attract persons from other areas.

Population Supported by Project-Related Jobs. Project-related jobs would support nearly 3,000 persons statewide at build-out, most of whom would likely live in Leeward Oahu. By buildout, some 730 workforce households in Leeward Oahu--nearly 1,000 statewide--would be associated with direct, indirect and induced project-related jobs. Housing for these workers and "new" units for workers who are establishing new households will amount to a small fraction of the housing supplied by the project.

5.2 Housing

Existing Conditions

As Oahu's designated "second city," the Ewa area is experiencing a boom in housing development. In the mid 1980's, new residential construction began with the first phases of these projects: Ewa by Gentry, Villages of Kapolei and West Loch. In 1990, there were 11,734 housing units. By mid-1993, 15,301 units had been built (Honolulu Planning Department, September 1994).

Section 2.3 of this document presented a brief description of several major residential areas within the Ewa-Kapolei region, including older, established communities as well as newer planned communities which are still expanding. The plantation-era Ewa Villages, located immediately south of the project area, had a population of 3,780 in 1990. Two thirds of the households were owner-occupants, with one-third renters. Ewa Beach, just further south, was developed in the 1940's and had 3,426 housing units in 1990. The Naval Air Station (NAS) Barbers Point is a Navy aviation facility which comprises 3,700 acres. In 1990, it had 2,218 residents. Although the air station is scheduled to close in 1997, the existing Navy housing units, as well as recreation areas, will be retained. The residential area of Makakilo, located mauka of the H-1 Freeway, had 10,000 residents in 1990. Up to 6,174 homes are anticipated at Makakilo at build-out.

More recent residential development in Ewa includes Ewa by Gentry, which in by mid-1994 had over 3,000 homes. The West Loch project was developed by the City and County of Honolulu, and encompasses 491 acres in Honouliuli, on the western edge of Pearl Harbor's West Loch. A total of 1,421 units were completed through the middle of 1994, with a total of 1,600 residential units planned by buildout. The Villages of Kapolei is being developed by the State Housing Finance and Development Corporation in conjunction with the Department of Housing and Community Development. The first homes were completed in 1990, with up to 5,000 units planned at buildout. As of the end of 1994, there were about 1,400 units completed at the Villages of Kapolei.

Future Without Project

Between 1993 and 2010, an estimated 23,075 new units will be built for Hawaii residents in Ewa.

Probable Impacts

At full build-out, the East Kapolei project will provide approximately 10,000 new homes for Oahu residents, with about 75 percent of the units consisting of multi-family apartments and townhomes and 25 percent single family homes. Of the 10,000 units, 60 percent will be affordable to families earning less than 140 percent of median income. Thirty percent or about 3,000 of the homes will be affordable to families earning below 120 percent of median income, with 1,000 of these homes affordable to families earning below 80 percent of median income.

The project will result in a significant addition to the housing stock in the region. The new homes will expand the range of available housing choice, and will address the needs of gap and moderate income households. Other factors contributing to the project's social impact include:

- The project will provide thousands of units of affordable housing in response to islandwide need;
- The increased population associated with the project will serve as a catalyst for regional infrastructure, including the North-South Road, needed to support regional institutions and other housing areas; and
- The project could reinforce the existing development trend, of housing development in advance of employment centers and community facilities.

5.3 Employment

Existing Conditions

For most of this century, agriculture, specifically sugar cane, has been the primary source of employment in the Ewa-Kapolei area. Another major employer has been the Naval Air Station (NAS) Barbers Point, which in 1990 provided 56 percent of the jobs in the Ewa Development Plan area. The anticipated closure of NAS Barbers Point in 1997 will result in the loss of most civilian jobs in support of existing military operations. Other major employers in the Ewa region include the James Campbell Industrial Park, the new State-owned Barbers Point Harbor, and the Ko Olina Resort, a planned resort community at the southwest end of the Ewa region.

Future Without Project

Ewa is expected to have the highest employment growth rate of all the Oahu Development Plan areas, estimated at 5.11 percent annually, compared to 0.6 percent for the Primary Urban Center. This projection anticipates successful relocation of government offices to the Kapolei Civic Center, formation of a strong employment base by light and heavy industrial uses, fully operational maritime activity at Barbers Point Deep Draft Harbor, and replacement of the Barbers Point military base with new job centers. At build-out, the Ko Olina Resort, is expected to employ 9,000 persons, providing 15 percent of the jobs in the Ewa DP area by the year 2010. (ibid).

Probable Impacts

The project's employment impacts involve short-term construction related jobs, as well as long-term jobs associated with continuing operations. Employment impacts for both construction and operations are of three types:

- Direct jobs; immediately involved with construction of a project or its operations;
- Indirect jobs; created as businesses directly involved with a project purchase goods and services in the local economy;
- Induced jobs; created as workers spend their income for goods and services.

Construction. The development of the East Kapolei project is expected to support a large number of construction jobs from 1996 through 2011. The cumulative total for the entire period is about 13,000 person-years of direct employment and some 28,400 person-years of indirect and induced jobs. The project will support some 750 or more full-time direct construction jobs annually through 2010. About 80 percent of the construction jobs (approximately 600 jobs each year) will be on-site for nearly the entire construction period.

Operations. Development of the project will also result in direct on-site operations jobs, primarily at the neighborhood commercial areas of the project. As stores are built, the workforce would grow to about 900 employees, with an additional 500 indirect and induced jobs statewide supported by spending by direct operations enterprises and workers.

The project will provide housing for Oahu residents who will patronize local stores and shops wherever they live. Therefore, most of the operations jobs associated with the project would exist somewhere on Oahu, even without the project, and are not "created" by the project. The operations jobs do not create an "impact" on islandwide employment; although the project causes these jobs to be located in Ewa.

5.4 Fiscal Impacts

5.4.1 Construction-Period Income

The income of direct construction employees will average about \$35 million annually from 1996 to 2010. Annual incomes from direct, indirect and induced jobs associated with construction will average \$75 million or more during this period. Direct operations incomes will grow to total over \$10 million annually by 2010. These will be divided equally between operations in Phase 1 and Phase 2.

5.4.2 Public Costs and Revenues

The project will generate revenues for the City and County of Honolulu, primarily from real property taxes on developed land and buildings. By the year 2000, annual revenues would reach \$1.8 million (1994 dollars) and to \$6.5 million at project build-out. In contrast, only \$171,000 could be raised in annual taxes from the property under its current use. The cumulative new tax revenues for the City and County through the year 2010 are estimated at \$42.1 million (1994 dollars).

Revenues will accrue to the State of Hawaii from project construction (excise taxes, corporate income taxes, personal income tax). These revenues will average well over \$6 million annually during the construction period and add up to some \$105 million (1994 dollars) as of buildout.

Because the project will not attract new residents to the City and County, it will have little or no impact on City and County operating costs. Some concerns have been expressed by the City that new development such as the project will increase public costs due to demand for capital improvements and added costs in delivering services to out-of-the-way locations. However, because the project is located in Ewa, it will contribute to the funding of already-planned capital improvements. In addition, by helping to bring the planned population to Ewa (in keeping with City and State policies), the provision of public services in Ewa will likely become more cost effective.

As a participant in planning and development of infrastructure in central Ewa, the project is likely to lower government costs. This is due to the developer's participation in regional roadway and drainage improvements, which the State is committed to, in order to support its proposed West Oahu university campus.

5.5 Market Analysis

A Market Assessment report for the project was prepared by Gail W. Atwater, AICP (October 1994) and is included as Appendix D. The objectives of the Market Assessment were to analyze existing site conditions, evaluate market potential via supply and demand for residential development, estimate residential absorption and pricing for residential

development and evaluate the market potential for neighborhood commercial development on the subject property. The analysis, which included interviews with brokers, builders and landowners, defined the market study area for residential development on the project site. This area includes the master planned communities within the Ewa Development Plan Area and along the western H-1 corridor including the Central Oahu communities of Waikele and Royal Kunia.

Key findings of the Market Assessment include:

- There is demonstrated demand for an additional 36,000 to 41,000 units by 2010 within the market study area (of which 29,000 to 33,000 are in the Ewa Development Plan Area). The East Kapolei project is expected to capture 25 to 30 percent of the market study area demand, which compares favorably with similar projects in the region.
- An imbalance will occur between overall supply and demand within the market study area, indicating a shortfall of 8,500 to 13,000 units by 2010.
- Based on a retail trade area defined as a three-mile radius from its center, estimated demand for an additional 43 acres of neighborhood-serving retail uses will be generated by 2010 on the parcel. As the property is subject to a deed restriction which limits commercial to 20 acres (two acres per 1,000 units), more than adequate demand is demonstrated for this land use.

5.5.1 Site Characteristics and Area Review

The subject site is well-positioned for development by virtue of its location within the second urban center in Ewa and its position adjacent to the planned University of Hawaii West Oahu campus. Development of the site is consistent with governmental population allocation policy, specifically General Plan guidelines indicating 12.0 - 13.3 percent of Oahu population in Ewa by 2010. The site's relatively flat terrain will facilitate residential and commercial development. The subject property is adequately served by existing roads, with excellent access expected through development of the North South Road and completion of Kapolei Parkway. The project also exhibits many of the same attributes as the successful Waikele development, such as location, access and primary homebuilder.

Macro and microeconomic conditions examined in the "area review" of the Market Assessment indicate moderate near term and strong long term growth trends in both residential and commercial indicators, with demonstrated pent-up residential and retail demand. More specific conclusions of the area review include the following:

- Oahu's General Plan and Land Use Model forecast the most rapid population growth in the subject property's region of Ewa;

- The combination of increasing housing stock and decreasing household size will create demand for additional housing of 36,000 to 41,000 units within the market study area by 2010 (of which 29,000 to 33,000 are located in the Ewa Development Plan Area);
- The slow rise in real personal income, combined with accelerating home prices, will generate further need for affordable and moderate-priced housing such as that proposed for this project and which the project developer has demonstrated success in serving;
- An analysis of 30 years of residential building permits shows correlated trends toward affordability and greater proportion of multi-family units on Oahu -- a trend with which this project is consistent, with its 75 percent multi-family and 30 percent affordable units; and
- Indicators supporting commercial development include sufficient demand from the existing and proposed housing for the area surrounding the project plus the adjacent location of the planned University of Hawaii at West Oahu campus.

5.5.2 Residential Market Assessment

The Market Assessment included an analysis of the residential market forces which will determine the viability of the East Kapolei project. The analysis concluded that there is sufficient demand for the residential units proposed for the East Kapolei project based on economic conditions and the expected growth in population within Oahu's second city.

- An additional 36,070 to 40,883 residential units are expected to be needed by 2010 (of which 28,856 to 32,706 are located in the Ewa Development Plan Area).
- There is estimated to be a shortfall of 8,509 to 13,222 residential units within the market study area by the year 2010.
- The East Kapolei project's capture rate of approximately 25 percent of the market study area compares favorably with past performance of other projects with similar pricing and product. The project's capture of Oahu's total new home market is expected to be in the range of 12 to 14 percent.
- The expected absorption rate of 650 to 700 units per year is consistent with sales history of similar developments in the region and conservative compared to the developer's own Oahu sales record.

The above conclusions were based on an detailed analysis of present and future supply and demand conditions and other market forces within the designated market study area. Total adjusted demand for the market study area was estimated at 52,961 to 57,774 units, which includes 16,891 existing homes. This demand is based on expected population

growth and a vacancy factor to provide a healthy real estate market. To a lesser degree, demand for housing on the subject property will be influenced by the planned university campus.

Population estimates for Oahu and allocations of growth to the market study area were based on the General Plan guidelines and forecasts of population and units provided by the Planning Department in its 1993 publication entitled Forecast of Population, Housing and Employment on Oahu by Small Area 1990 - 2010. Relevant demand from Central Oahu communities of Waikele and Royal Kunia was estimated based on Traffic Analysis Zone forecasts of population provided in the Planning Department's 1993 Land Use Model.

Total adjusted supply for the market study area -- also including 16,891 existing units -- was 44,452 units by 2010. Expected additions to the supply of residential units within the market study area were based on construction schedules reported to the Planning Department by 11 relevant master planned communities. Adjustments to developer-provided unit estimates were made based discussions with Planning Department staff concerning their latest Land Use Model assumptions, the history of chronic delays in certain projects, level of "committed" versus "proposed" units, recent market conditions and delays in provision of needed infrastructure. A further adjustment to future supply calculations was made to reflect the impact of non-resident occupancy of residential units due to the proximity of resort areas such as Ko Olina and Ewa Marina.

The result of total adjusted supply versus demand is an estimated shortfall of 8,509 to 13,222 residential units within the market study area by the year 2010.

Future market capture of additional demand within the market study area will be shared by the East Kapolei project and other area developments. The Market Assessment assumes a 25 percent market share for the East Kapolei project within the study area by 2010. This rate is similar to projects such as Ewa by Gentry, Makakilo, Waikele and West Loch Estates which have ranged from 15 to 44 percent of new home sales within the study area.

Anticipated residential product offerings, pricing and market performance were based on an analysis of target markets and the actual sales performance of similar developments in the market study area offering affordable and moderate-priced residences. The project developer has demonstrated a commitment to providing well-designed housing to this segment of the market. The hypothetical absorption schedule for 10,000 units indicates an average of 650 to 700 per year over a 15-year build out period. Approximately 75 percent of the units will be multifamily. Thirty percent will be offered to families with household incomes of 120% or less than the Oahu median. The proportion of "affordable" units is consistent with the City and County's draft rules for unilateral agreements requiring affordable housing, which was confirmed by meetings between the developer and state and county housing-related regulatory agencies.

5.5.3 Retail Market Assessment

The Market Assessment's retail analysis concluded that the proposed development appears to be well positioned to serve a variety of community retail needs. Demand for an additional 43 acres or 468,300 square feet of neighborhood commercial space was estimated within a trade area defined as a three-mile radius from the center of the parcel. Tenants drawn to the subject property will primarily provide goods and services for its residents through neighborhood shopping center facilities to be developed at the end of the project's build-out in 2010-2011. Potential retail uses which could be included in the project's neighborhood commercial area include supermarkets, drug stores, restaurants, apparel shops and dry cleaners. Additional retail outlets catering to the needs of the adjacent university could also be viable, such as bookstores, photocopiers and coffee shops.

Total additional demand of 164 acres for neighborhood center facilities on the subject parcel is expected from residents of proposed development, construction of the nearby University of Hawaii at West Oahu campus and expansion of other master planned communities within the retail trade area. Planned additions to supply of 121 acres were also evaluated to determine the imbalance between supply and demand. The imbalance indicates a shortfall of 43 acres.

The Market Assessment noted that a deed restriction in the land exchange and purchase agreements between Schuler Homes, Inc. and the Estate of James Campbell limits commercial use within the project area to two acres for every 1,000 residential units. The resulting 20 acres or roughly 218,000 square feet of allowable commercial space are well below the estimated demand of 468,300 square feet on 43 acres.

5.6 Agricultural Impacts

An agricultural impact study was conducted for the project by Decision Analysts Hawaii, Inc. (September 1994). The study is included as Appendix G.

Existing Conditions

The soils within the project are well suited for agricultural activities. In addition, the area is serviced by high quality dirt roads, a drip irrigation system and electrical power to drive large-volume pumps used for irrigation. The site is in a highly desirable location, with relative proximity to consumer markets and suppliers. Historically, the central Ewa plain was referred to as the "golden triangle," due to its relatively high sugarcane yields and low farming costs. (Decision Analysts Hawaii, Inc., September 1994).

The project site is presently leased to Oahu Sugar Company, Ltd. (OSCo), and is used for the cultivation of sugarcane. However, Amfac/JMB Hawaii, owners of OSCo, have announced that this unprofitable plantation will close after its 1995 harvest.

Probable Impacts

Sugarcane Operations. Because OSCo is closing for reasons unrelated to the proposed project, and will close before development is scheduled to begin, the project will have no impact on sugar operations.

Pineapple Operations. The project will have an indirect positive impact on pineapple operations. The 500-acre Phase 1 area was part of a land exchange for some 2,000 acres of land in Poamoho, north of Wahiawa in Central Oahu. The Poamoho area has high quality pineapple fields cultivated by Del Monte Fresh Produce Hawaii, Inc. If the land exchange had not occurred, the subject residential project would have been developed on the Poamoho lands. This would have required Del Monte to expend about \$700,000 to reconfigure new fields in order to continue its pineapple cultivation. Because of the land exchange, the excellent Poamoho lands will be retained for pineapple cultivation, avoiding significant cost and disruption of operations.

Interim Diversified Agriculture. The 500-acre Phase 1 area is being obtained from the State of Hawaii. Until construction begins, the State will make this land, or remaining undeveloped portions, available to farmers under short-term lease to grow seed corn and other diversified crops. Due to the substantial contraction of plantation agriculture in Hawaii, there is an excess supply of agricultural land Statewide and on Oahu. As a result, the temporary availability of the Phase 1 land is not expected to significantly affect the amount of agricultural activity on Oahu or Statewide. It may, however, temporarily affect the location of some operations.

Growth of Diversified Agriculture. Finally, the project will not have an adverse impact on the growth of diversified agriculture. Ample prime agricultural land and water is available to accommodate diversified agriculture, as much land on Oahu and Statewide has been recently freed from sugar and pineapple production. Moreover, the limiting factor in the growth of diversified agriculture is not land supply but the size of the market for those crops that can be grown profitably in Hawaii. The proposed project involves far too little land to impact the diversified agriculture industry.

Mitigation

No mitigation measures are required, as the project will not have an adverse impact on sugar production or diversified agriculture, and will, indirectly, have a positive impact on pineapple cultivation. Overall, the project is consistent with State and County plans and policies concerning agriculture, population growth and housing.

6.

ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE
IMPACTS: PUBLIC FACILITIES AND SERVICES

CHAPTER 6
ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE IMPACTS:
PUBLIC FACILITIES AND SERVICES

6.1 Transportation

Transportation impacts were addressed in a Traffic Impact Assessment completed by Pacific Planning and Engineering, Inc. (October 1994), included as Appendix K. The study describes the probable impact of traffic generated by the proposed development in the years 2005 and 2011, when each of the two project phases is complete.

Existing Conditions

The project area is located west of Fort Weaver Road in Ewa, south of existing Farrington Highway and just east of the proposed North-South Road. The project area is presently agricultural with no existing traffic. The site is currently served by Farrington Highway, a two-lane highway connecting Waipahu and Kapolei. Just north of Farrington Highway, the H-1 Freeway provides major east-west access.

Probable Impacts

Vehicular access to the project will be provided by three intersections, which were the primary focus of the traffic impact assessment:

- Farrington Highway and the project spine road ("Project Driveway C");
- Proposed North-South Road at Secondary Project Road ("Project Driveway A")
- Proposed North-South Road at Project Spine Road ("Project Driveway B")

The two North-South Road intersections are assumed to be four-legged intersections, also providing access to the proposed university to the west of the project site. The ramps at the H-1 Freeway interchange with the proposed North-South Road were also analyzed. The traffic report describes the impacts of each study roadway segment by the level of service (LOS) and capacity levels for the years 2005 and 2011.

The analysis indicated that the proposed project will significantly change the traffic flow quality at the study intersections when the project is completed in two phases. Future traffic volumes at nearly all the study intersections will exceed planned capacity if improvements are not made. Level of service at several of the roadway segments worsen with the project.

Mitigation

The following actions were recommended by Pacific Planning and Engineering, Inc. for the year 2005 (Phase 1) to minimize the impact of the project and provide for smoother traffic operating conditions:

- Two left-turn lanes northbound exiting Project Driveway C onto Farrington Highway.
- Two left-turn lanes westbound at the intersection of Farrington Highway and the North-South Road.
- Addition of an extra through lane along Farrington Highway from about 1,000 feet west of the intersection of Farrington Highway and the North-South Road to Project Driveway C.
- A project connection to the North-South Road would relieve traffic at other intersections. If a connection is made, the two left-turn lanes at the intersections of Farrington Highway with the North-South Road and Project Driveway C may not be required to handle makai-bound traffic volumes. However, makai-bound traffic would shift to the North-South Road connection and thus this intersection would require two left turn lanes exiting the project.

For the year 2011 (Phase 2), mitigative measures for the study intersections would be more involved because of the level of traffic volumes during peak hours. The possibility of a grade separation at the intersection of Farrington Highway and the North-South Road would increase capacity through the area. However, alternate transportation actions are recommended for investigation, including development of a comprehensive plan for the area that includes both Transportation System Management and Transportation Demand Management concepts. Integrated transit services, roadway plans and construction schedules, computer controlled traffic lights, remote parking areas, shuttle services, paratransit, bicycle and pedestrian ways and some form of exclusive way transit should be considered in a comprehensive plan.

The Pacific Planning and Engineering, Inc. study also notes that plans for reuse of Naval Air Station Barbers Point will have regional traffic impacts, and that 2011 (Phase 2) impacts should be reevaluated when more information is available. In fact, much of the future growth in traffic demand will be due to other developments in the interim period. State and City agencies have considered roadway improvements throughout the Ewa Region as Kapolei City and its environs grow over time. The Oahu Metropolitan Planning Organization has incorporated specific highway improvements in its long range development plan, and member agencies are continuing to evaluate the changes in land use plans and effects on the future road network. Elements of the roadway plans are still preliminary, for example, the final planning for the proposed North-South Road paralleling Fort Weaver Road has not yet been completed.

The approved land use schedule and access points for this project will be a direct input into finalizing those long range plans. Public transit and other transportation management plans would need to be developed in concert with the highway long range plans for the region.

The developer will participate in the preparation and implementation of the Ewa regional transportation master plan. The developer is coordinating its involvement through the Estate of James Campbell, which is spearheading the master plan effort.

6.2 Water Supply

A Water Master Plan for the area bounded by the H-1 Freeway, Ewa Villages, Kapolei and West Loch has been prepared by Tom Nance Water Resource Engineering (October 1994) and is now being reviewed by the Honolulu Board of Water Supply. This document is included as Appendix J. Projects which will be served by the Master Plan include the East Kapolei Project, the 500-acre University of Hawaii site, the proposed 50-acre high school site, the Department of Hawaiian Home Lands sites and remainder lands owned by the Estate of James Campbell (EJC). The water master plan identifies source requirements, storage requirements and major transmission requirements to provide potable water to the planning area (Figure 14).

Existing Conditions

Groundwater in the project vicinity occurs in two aquifers: the deeper (and higher quality) Waianae volcanic aquifer and the overlying (mostly brackish to salt water) coral aquifer. The Waianae aquifer is fed by rainfall which infiltrates surface soils and rock to supply the basal groundwater supply. The two aquifers are separated by marine, clay and silt sediments which have low permeability, forming a "caprock," which retards the flow of water between the two aquifers. This caprock slows down the seaward movement of freshwater from the higher aquifer to the coral aquifer.

The project area is presently served by an agricultural water system maintained by Oahu Sugar Company.

Probable Impacts

Phase 1 will ultimately have an average daily potable water demand of 2.6 MGD. This corresponds to a peak daily demand of 7.8 MGD. Phase 2 will ultimately generate an average daily water demand of 2.1 MGD and a peak requirement of 6.2 MGD. Phase 1 of the project would be served by a proposed 228 system. Phase 2 of the project would be served by a new 440 system. Both systems are identified in the Water Master Plan.

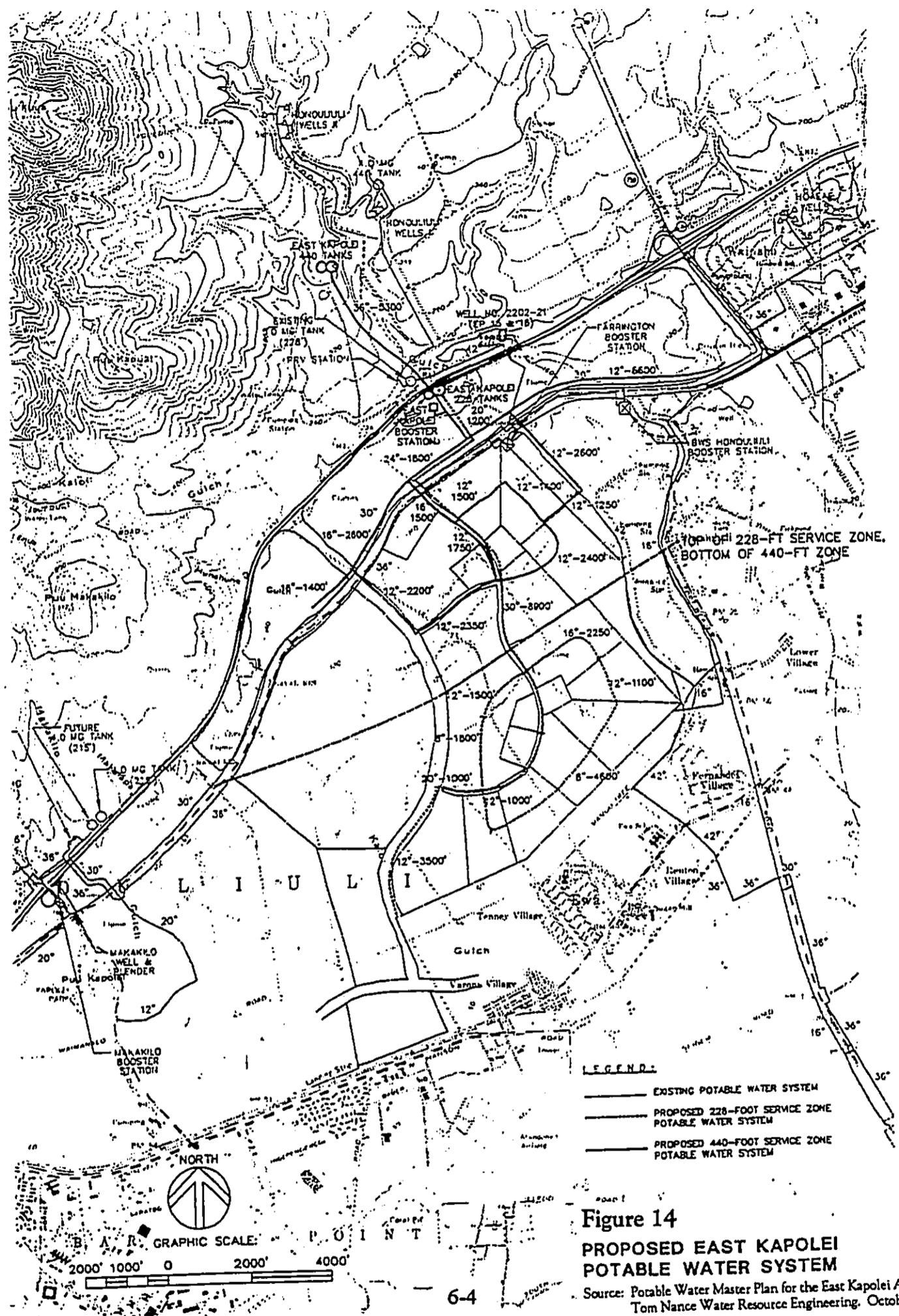


Figure 14
PROPOSED EAST KAPOLEI
POTABLE WATER SYSTEM
 Source: Potable Water Master Plan for the East Kapolei Area.
 Tom Nance Water Resource Engineering, October 1994

The Estate of James Campbell has indicated concern over the possible use of Ewa Shaft (EP 15 and 16) as a water source for the project (See letter attached in Appendix B). Once a commitment has been obtained from the Board of Water Supply, it will be the responsibility of the developers of the master planned area to design, construct, and dedicate the water system to the Board in accordance with its standards and requirements.

As a residential project, the East Kapolei development is not required to use non-potable water. However, the project's two elementary school and three park sites will be dedicated to the State Department of Education and City Department of Parks and Recreation, respectively. Development of the schools and parks will be the responsibility of these agencies, which will respect the rules and regulations for use of non-potable water in their development.

6.3 Wastewater

Existing Conditions

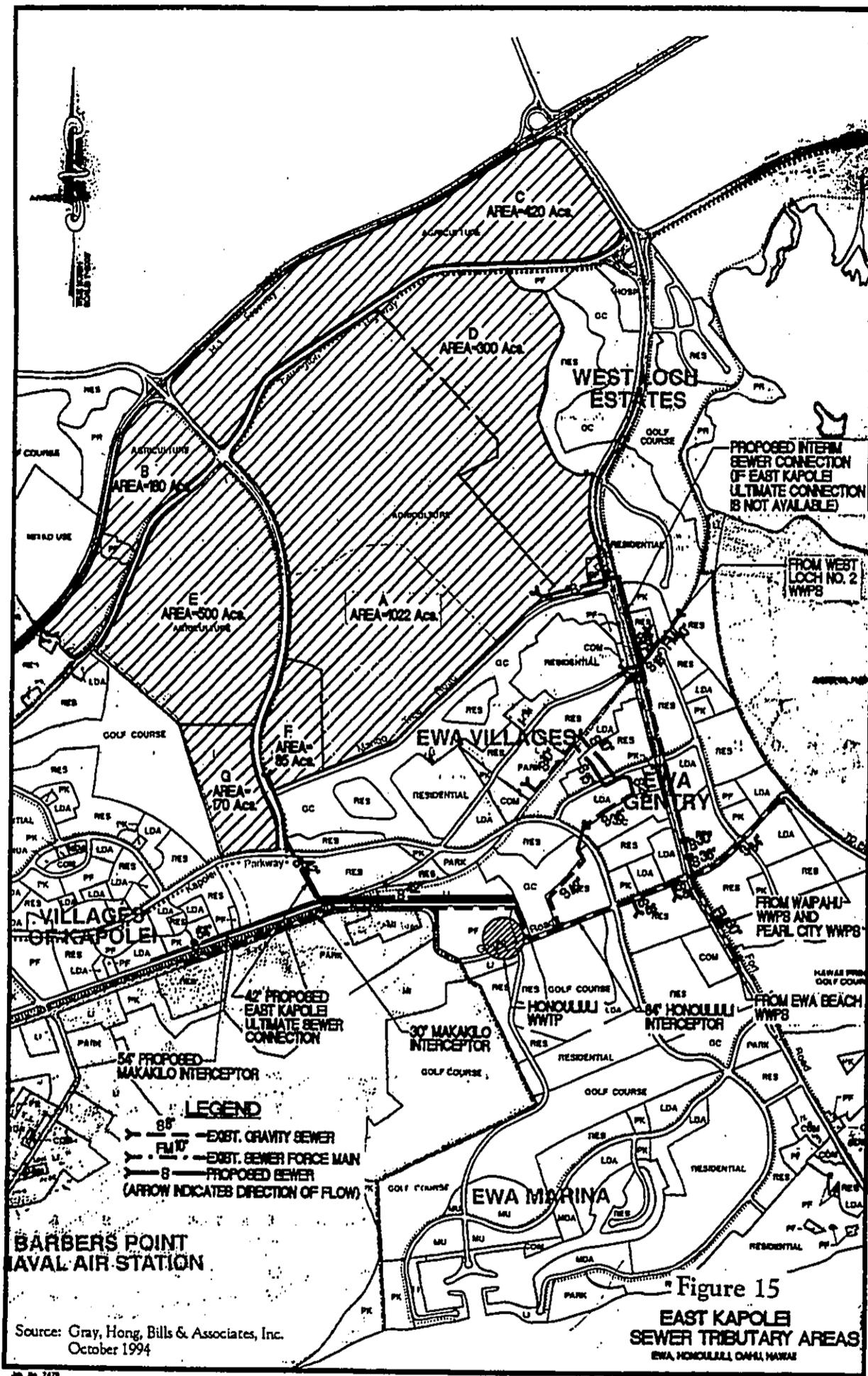
There is currently no wastewater collection system within the project area to serve either of the East Kapolei Project phases. The greater Ewa-Kapolei area is served by the City and County's Honouliuli Wastewater Treatment Plant (WWTP), adjacent to the NAS Barbers Point. The Honouliuli WWTP also services Central Oahu and the Primary Urban Center areas west of Red Hill, with the exception of military installations and facilities. Wastewater currently receives advanced primary treatment and is disposed via the Barbers Point Ocean Outfall. Future expansion of the WWTP will be built to secondary treatment standards.

Probable Impacts

An analysis of wastewater infrastructure and mitigation has been completed by Gray Hong Bills and Associates, Inc. and is summarized below.

The East Kapolei Project will ultimately generate 2.8 MGD of sewage, 1.4 MGD from each phase. A sewer system will be provided to collect and transport project-generated sewage to the Honouliuli Wastewater Treatment Plant. Figure 15 shows the major off-site interceptor sewer which would deliver sewage to the Honouliuli Treatment Plant. This system is identified as the proposed 42-inch east Kapolei ultimate sewer connection.

As with the water system, the area bounded by Kapolei to the west, West Loch Estates to the east, H-1 Freeway on the upper side and Ewa Villages on the lower side is being master-planned. This will ensure that the City and County of Honolulu Department of Wastewater Management does not have to accept numerous interceptors from the unsewered area defined in the Wastewater Master Plan. The project engineers have consulted with the Department of Wastewater Management which has indicated its general concurrence with the Wastewater Master Plan.



The City and County Department of Wastewater Management will include the project-generated sewage to the Honouliuli Wastewater Treatment Plant in the West Mamala Bay Facilities Plan, currently being prepared. (Correspondence from Felix B. Limtiaco, Acting Director, Department of Wastewater Management, December 29, 1994).

6.4 Drainage

A Preliminary Drainage Study has been completed for the project by Gray Hong Bills and Associates, Inc. Figure 16 shows the drainage basin and ultimate method of providing adequate drainage to the East Kapolei Project.

Existing Conditions

The East Kapolei Project spans portions of two separate drainage basins. The western portion of the project area flows into the Kaloi Gulch drainage basin and the east side flows into the West Loch tributary basin.

West Loch Tributary. The entire West Loch drainage basin extends from below the H-1 Freeway to the shoreline, encompassing two square miles and several different developments. The total West Loch drainage basin encompasses approximately 1,196 acres and generates a potential storm runoff of 3,100 cfs. The West Loch drainage basin in the vicinity of the project consists of a tributary area of approximately 937 acres. One hundred seventy-seven acres are located between Farrington Highway and the H-1 Freeway, 36 acres are adjacent to the project site, and the remainder is primarily within the project area and consists of about 724 acres. Storm runoff is presently low due to areas that are still undeveloped. Storm runoff will increase substantially upon proposed development of the tributary area. Table 6 below shows projected cumulative storm runoff for the various portions of the drainage basin, including the East Kapolei Project area. These estimates are based on county standards.

Source: Gray, Hong, Bills & Associates, Inc.
March 1995

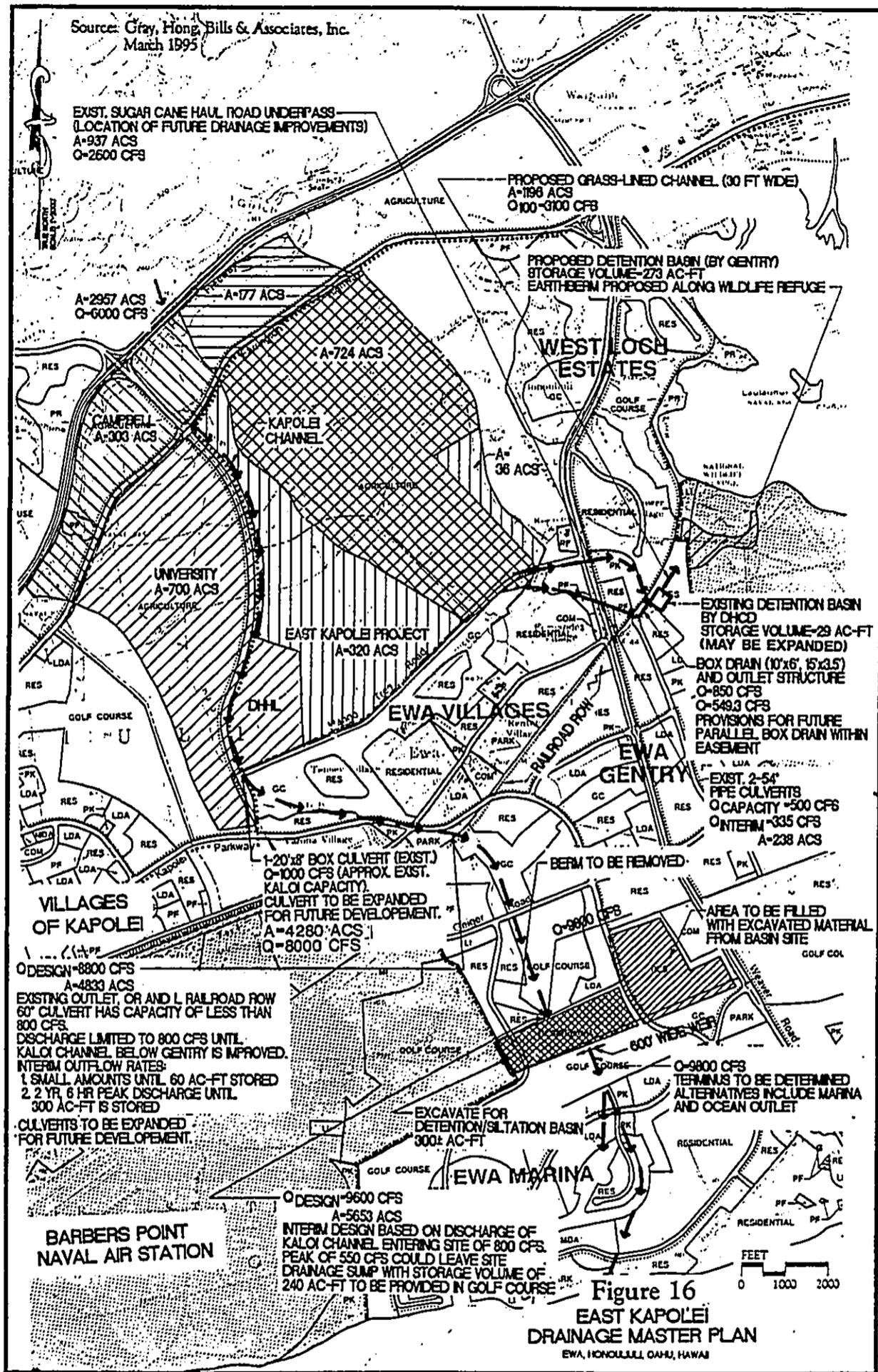


Figure 16
EAST KAPOLEI
DRAINAGE MASTER PLAN
EWA, HONOLULU, OAHU, HAWAII

**Table 6:
West Loch Tributary Storm Runoff**

	<u>Area (Acres)</u>		<u>Storm Runoff (cfs)</u>
	<u>Increment</u>	<u>Cumulative</u>	<u>Cumulative</u>
Between H-1 & Farrington Campbell	177	177	800
East Kapolei Project	724	901	2,500
Campbell - East & South of East Kapolei Project	36	937	2,600
Ewa Villages, Ewa Elderly Housing, East Campbell and portion of East Ewa Gentry	259	1,196	3,100

Source: Gray Hong Bills and Associates, Inc., October 1994

The storm runoff from undeveloped areas upland of the project flows from Farrington Highway through the project site, then through land owned by the Estate of James Campbell adjacent to the Ewa Villages. Storm runoff then flows in an undefined manner through a cane haul road under Fort Weaver Road, as well as over Fort Weaver Road to an existing siltation/detention basin within land owned by the EJC.

Storm runoff from the Elderly Housing site, a portion of the Ewa Villages site (via two 54-inch pipe culverts under Fort Weaver Road) and EJC land flows into an existing siltation/detention basin. This basin was built within EJC property (TMK 9-1-10:por 2) just southeast of the West Loch subdivision in conjunction with the West Loch Estates project. Overflow from the basin sheet flows toward the West Loch basin of Pearl Harbor.

Neither the Ewa Villages project nor the Elderly Housing project included improvement of the inadequate culverts under Fort Weaver Road. The box culvert within the Elderly Housing site, which runs from Fort Weaver to the detention basin, was not designed to handle the required 100-year design storm. However, a widened easement along the culvert alignment was provided for future improvements.

The existing cane haul road is within easement "2680" on a future park site owned by the City and County of Honolulu (TMK 9-1-17:66). The cane haul road runs from the project site to the existing detention basin. Any runoff collected by the road ponds at the low-point at the underpass until it is forced out toward the basin.

Existing constraints that affect the regional drainage for the West Loch basin are:

- Inadequate drainage improvements under Fort Weaver Road
- Inadequate drainage culvert through the Ewa Elderly Housing project
- Unimproved seaward terminus of the West Loch tributary basin.

Kaloi Gulch Tributary. The Kaloi Gulch drainage basin extends from the crest of the Waianae Range to the shoreline within the Ewa Marina development, encompassing approximately 11 square miles and several different developments. Presently, Kaloi Gulch has limited drainage capacity, and portions of the gulch are man-made, consisting of two levees built up above the original ground level. Storm runoff will increase substantially due to development of the tributary areas. The approximate areas and projected cumulative storm runoff flows are presented in Table 7 below:

**Table 7:
Kaloi Gulch Tributary Storm Runoff**

	<u>Area (Acres)</u>		<u>Storm Runoff (cfs)</u>
	<u>Increment</u>	<u>Cumulative</u>	<u>Cumulative</u>
Mauka of H-1 Freeway Campbell	2,957	2,957	6,000
Between H-1 & Farrington Campbell	303	3,260	6,200
East Kapolei Project	320	3,580	6,800
West Oahu College High School & DHHL	700	4,280	8,000
Ewa Villages	553	4,833	8,800
Ewa Gentry	820	5,653	9,600
Laulani - Campbell Estate	213	5,866	9,800
Ewa Marina	927	6,793	11,100*

*Total storm runoff to ocean terminus will depend upon the actual Ewa Marina configuration and onsite drainage system

Source: Gray Hong Bills and Associates, Inc., October 1994

Each of the developments has been master planned to pass-through the ultimate regional drainage flow. Constraints are noted below.

The manner or location of the seaward terminus of the Kaloι Gulch Watershed has not been determined. Existing constraints that affect the regional drainage for Kaloι Gulch are:

- Reconstruction of the inadequate drainage culvert at the mauka end of Ewa Villages
- Removal and reconstruction of the inadequate drainage culvert at the railroad tracks between Ewa Villages and Ewa Gentry.
- Determination of the manner and location of the seaward terminus of the Kaloι Gulch watershed.

Probable Impacts and Mitigation

Onsite Improvements. Onsite drainage improvements will include catch basins, underground drain pipes, culverts and channels. All improvements will be designed in accordance with applicable drainage standards of the City and County.

Off-Site Improvements. Off-site improvements will be made within the West Loch and Kaloι Gulch tributaries, as summarized below.

1. *West Loch Tributary.* It is proposed that the eastern portion of the East Kapolei project, which flows into the West Loch drainage basin, be developed first.

Presently, a storm drainage system is being designed for the adjacent Ewa by Gentry-East project. The Ewa by Gentry-East Phase 1 Drainage Report (Park Engineering, October 1994, revised) and associated construction plans indicate that this system is being designed to accommodate runoff, under developed conditions, from the eastern portion of the East Kapolei project, and from adjacent EJC lands within the West Loch drainage basin. It is proposed that onsite drainage for the East Kapolei project connect to this West Loch drainage system.

Construction plans for the Ewa by Gentry-East Phase I project show that the existing siltation/detention basin adjacent to the Elderly Housing site is to remain, with overflow sheet-flowing into the larger proposed siltation/detention basin. Their proposal includes a channel which will lead from the basin, just makai of the National Wildlife Refuge, into the West Loch of Pearl Harbor. The channel will collect runoff from the Ewa by Gentry-East project and discharge into the new detention basin. The new detention basin will have 273 acre-feet of storage (see Figure 16) and will provide required storage for the 2-year, 24-hour storm generated from the fully developed drainage basin.

Under existing and ultimate design flows, overflow from the existing siltation/detention basin inundates a portion of the EJC land between the West Loch Subdivision and Ewa by

Gentry-East. Based on consultation with the designers of the Ewa by Gentry-East drainage system, the EJC land downstream of the existing detention basin is to be filled to a minimum elevation of 17.0 feet to protect the property during interim conditions (i.e., before development west of Fort Weaver Road). The elevation of the hydraulic grade line (HGL) under interim conditions, of the 100-year peak flow, is 16.2 feet. Under ultimate conditions, for the 100-year peak flow, the HGL will be 18.4 feet. Filling of the site above the HGL under ultimate conditions has not been proposed.

In order for runoff from the project site to reach the detention basin, water from the area must either be channelized along the existing cane haul road around the future park, or must pass through the Ewa Village Golf Course, under Fort Weaver Road and through the Elderly Housing Development. The option of passing through the Elderly Housing Development would involve upgrading the culvert crossing at Fort Weaver Road and constructing an additional drain line between existing buildings in the Elderly Housing. However, due to the difficulties, expense, and undesirable disruption associated with this option, it is alternatively proposed that improvements be made along the cane haul road.

This alternative offsite drainage system being proposed for the East Kapolei project would include a culvert/channel from the project's southeast boundary to the cane haul road underpass at Fort Weaver Road, continuing within an easement around the future park site to the existing detention basin. The proposal includes a reinforced concrete rectangular channel sized to carry the 100-year peak flow of 2,600 cfs (937 acres). A six-foot high chain link fence will be installed on both walls and the ground alongside the channel will be graded to drain towards the channel.

A pedestrian overpass linking the West Loch Subdivision Phase 2 to the park is proposed. Without the overpass, access from West Loch subdivision to the park is not possible due to elevation differences averaging 7-feet to 20-feet between the cane haul road and the ground on either side.

A box culvert will be constructed to connect the channel to the existing detention basin. Once in the basin, the peak flow will overflow. An unlined channel will be cut from the existing basin to the proposed Ewa by Gentry-East basin. The channel will be trapezoidal with 2:1 (H:V) side slopes, approximately 630 feet long and 300 feet wide. Velocity within the channel will not be greater than five feet per second.

It is proposed that the overflow of the existing detention basin be lowered. A berm will be constructed 10 feet from the OR&L right-of-way along the length of the channel, with a top elevation a minimum of two feet above the HGL. Beyond the channel, the HGL will be dictated by the ocean outlet. The Ewa by Gentry-East detention basin includes a berm along the West Loch Subdivision boundary. It is proposed that the berm be extended through the EJC property to meet the channel berm.

The berm serves mainly to prevent flood waters from inundating the existing OR&L right-of-way, by confining water to the EJC property. It also serves to protect two low-lying

areas within the West Loch subdivision, the sewage pump station, and several lots along the cul-de-sac at Road "H". The buildings, however, have adequate freeboard above the ultimate HGL. The berm will serve to provide an extra degree of protection for this area.

Appropriate easements through EJC property (west of Fort Weaver Road) and the future park site would have to be obtained. Negotiations are presently underway to purchase from the EJC the 30-acre parcel on which the existing detention basin is situated.

It is proposed that the entire parcel with channel, berm and basin improvements be dedicated to the City and County of Honolulu. Approximately 40 percent of the 30-acre site is above the ultimate HGL and is, therefore, usable for development. Filling of the areas that are below elevation 17.0, to prevent inundation during interim conditions, would not be required under this proposal.

This drainage proposal has been submitted to the Department of Housing and Community Development, Department of Public Works and adjacent developers for their review.

2. Kaloi Gulch Tributary. The remainder of the project area (western portion) is within the Kaloi Gulch drainage basin. Future development also located in this drainage basin includes the University of Hawaii West Oahu campus, Department of Education high school, Department of Hawaiian Home Lands sites and remnant Campbell Estate parcels.

The onsite drainage improvements will connect to the inlet structure/culvert of Ewa Villages. Portions of the drainage system would also connect to the main Kaloi Gulch Channel within the proposed North-South Road corridor. An improved channel within the North-South Road ROW will convey off-site stormwater from Farrington Highway to the Ewa Villages boundary. This 60±-foot wide concrete channel will be designed and constructed to meet City standards, and ultimately dedicated to the City. A design feature of the channel will be the construction of an energy dissipation system located at the lower end of the East Kapolei project and upstream of the Ewa Villages project.

Complete resolution of drainage within the Kaloi Gulch drainage basin will require coordination with other projects located within the drainage basin. There are currently some inadequate drainage structures along the drainage basin watercourse. These are identified in Figure 16 and must be resolved for the benefit of all developments along the gulch.

A preliminary drainage report has been submitted to the DPW for review, proposing excavation of a detention/siltation basin within the western portion of the Laulani property owned by the EJC (between Ewa by Gentry and Ewa Marina). The basin would be used to meet two-year, 24-hour detention requirements for the University, East Kapolei, and a portion of the undeveloped mauka property. The excavated material could be used to fill the eastern portion of the Laulani property, making the remaining 147 acres usable for future development.

Coordination is required with DPW and the developers within the Kalo Gulch basin regarding the seaward terminus. A preliminary proposal to construct, within the Ewa Marina site, a direct channel, siltation basin, and an outlet to the ocean (east of the current Oneula Beach Park) has been submitted to DPW and the Ewa Marina developer for review. Preliminary studies show this alternative to be technically viable. It should be noted that this will not preclude connection to the marina, should the adverse impacts, maintenance and other issues be resolved and the marina is built.

6.5 Solid Waste

Existing Conditions

Refuse collection from residential areas in the Ewa-Kapolei area near the project site is provided by the City and County of Honolulu. Non-residential uses and multi-family residential areas are serviced by private refuse collection companies. Residential waste is transported to the City and County of Honolulu's H-POWER (Honolulu Program of Waste Energy Recovery) waste-to-energy combuster, located at the James Campbell Industrial Park. Ash residue and nonprocessible waste are then disposed of at the Waimanalo Gulch Landfill in west Oahu.

Probable Impacts

The 1,056-acre East Kapolei project will ultimately generate approximately 63 tons of solid waste per day, based on a generation factor of 4.2 pounds/person/day. The City and County of Honolulu will provide curbside refuse pickup service to single-family residences. Multi-family areas will typically hire a private waste company to collect and ultimately dispose of refuse.

The primary site of disposal will be the H-POWER facility. To accommodate future disposal requirements, the City plans to stress recycling efforts followed by physical expansion of existing facilities such as H-POWER.

Mitigation

During construction, project contractors will be encouraged to reduce waste generation to minimize waste disposal activities. Waste generation can be reduced by reusing or recycling certain construction materials such as ground cover and silt fences. Contractors will be encouraged to use secondary resources such as use of crushed glass in pavement base course and locally-produced greenwaste compost such as a soil amendment in landscaping as allowed by City specifications.

The developer will comply with all requirements of the City and County Department of Public Works (DPW) related to solid waste disposal facilities, and with waste diversion programs initiated by the DPW.

6.6 Schools and Libraries

Community Resources, Inc. study analyzed schools and libraries as part of its November 1994 study. The study described existing conditions and estimated project demand for these facilities, as summarized below.

Existing Conditions

Primary and Secondary Schools. The project is located within the State Department of Education's (DOE) Leeward School District and is within the Ewa Elementary School service area. According to the DOE, the rapid development in the Ewa-Kapolei area has created a pressing need for additional schools and classroom space. The proposed and projected Capital Improvements Program (CIP) budgets for the next three bienniums are already severely strained by the lack of CIP funds to build adequate classrooms. (Correspondence from Herman M. Aizawa, Superintendent of Education, December 29, 1994).

The Ewa area is currently served by one high school (Campbell High School); one intermediate school (Ilima Intermediate School) and five elementary schools (Ewa, Mauka Lani, Ewa Beach, Makakilo and Kapolei). The recently opened Kapolei Elementary School serves the Villages of Kapolei, Makakilo and Makaiwa Hills areas. For the 1994 school year, Kapolei Elementary had an enrollment of 350 students, with a projected enrollment between 800 and 850 when the school is completed by Fall 1995.

In addition, the Department of Education has plans to open a new Kapolei High School on a 50-acre site adjacent to the planned University of Hawaii West Oahu campus by 1998 to 1999. The school would accommodate between 1,500 and 1,800 students from the Kapolei Villages, Makakilo, Makaiwa Hills and Ko Olina Estates. A new intermediate school, planned in 1998-1999, will feed into Kapolei High School. The school will serve approximately 900 students.

The DOE also has plans to construct elementary schools at Ewa by Gentry and Ko Olina. Other elementary schools planned for the Leeward District include Waikele and Royal Kunia, which will feed into Waipahu Intermediate and Waipahu High School.

Post-Secondary Education. The nearest post-secondary educational facility is the University of Hawaii West Oahu, located in temporary quarters at the Leeward Community College in Pearl City. The University of Hawaii Board of Regents have selected a site adjacent to the project area for a proposed 500-acre University of Hawaii, West Oahu campus. The site will be transferred to the State by The Estate of James Campbell, with the condition that the campus must have 2,750 students enrolled by the year 2006, or land ownership will revert to The Estate of James Campbell. The University has begun master planning the campus, with site preparation and construction of infrastructure tentatively scheduled to begin in 1996 or 1997. A City and County planning

study has estimated that there will be up 6,020 students at the campus by the year 2020. Currently, the Legislature has yet to approve construction funds for the campus. (Atwater, October 1994).

Library Services. Ewa Beach Public Library serves approximately 40,000 residents within the Ewa area. The combination school and public library is a full-service library situated on the Campbell High School campus. There are currently plans to construct a major new Kapolei Library within the City of Kapolei, to serve as a "second anchor" to Honolulu's Downtown library. There are also long-term plans to separate the Ewa Beach School and public library into two facilities.

Probable Impacts and Mitigation

✓ *Primary and Secondary Schools.* The project will increase demands on public educational facilities in the Ewa area, which are already insufficient to meet the growing population in the region. The project provides two eight-acre sites for new elementary schools to serve the project and surrounding areas.

The DOE has estimated that at buildout (year 2015), the project would generate the following enrollments:

**Table 8:
Projected School Enrollment at Buildout
(10,000 residential units)**

	<u>Total</u>	<u>Ratio per 100 Units</u>
Elementary (Grades K-6)	1,772	17.72
Intermediate (Grades 7-8)	500	5.00
High (Grades 9-12)	710	7.10

Source: Dr. Herman M. Aizawa, Superintendent, November 4, 1994

When the ratios shown above are used with the project construction schedule, estimated enrollments for various years can be derived. This analysis notes that project enrollments could well justify construction of an elementary school before the year 2000, and a second school in 2005 or soon afterwards. Project residents would significantly contribute to intermediate and high school populations.

The DOE is requesting that the developer contribute two elementary school sites (of eight acres each if next to a dedicated City park) and an intermediate school site. In addition, the DOE indicates that it will request a contribution toward the construction of high

school facilities. The developer has entered into discussions with the DOE concerning possible contributions to offset the impact of the project on public school facilities.

Post Secondary Education. The East Kapolei project will contribute to the development and operation of the proposed University of Hawaii West Oahu by participating in regional infrastructure development (lowering overall costs to the State and other landowners) and by providing convenient housing for university students, faculty and staff.

Libraries. Current plans to expand the Waipahu Library, to build the Kapolei Library and to separate the Ewa School and Public Library are expected to accommodate any additional demand generated by the proposed project.

6.7 Recreational Facilities

Existing Facilities

Existing public parks in the project region include Ewa Mahiko Neighborhood Park, Puuloa Neighborhood Park, Makakilo Community Park, Geiger Park Gentry, and the new Kapolei Park. In addition, the City is planning a new district park at either Ewa Mahiko or near Ewa Villages. The City also expects to acquire a major new regional beach park within the Barbers Point Naval Air Station upon closure of the base in 1997.

Probable Impacts

The proposed project will increase demands on existing public recreational facilities. A review of the City and County of Honolulu's Park Dedication Ordinance Requirements indicates a need for 39 acres of park based on the proposed single vs. multi-family mix. This is illustrated in Table 9 below.

**Table 9:
Park Dedication Ordinance (PDO) Calculation**

Unit Type	Estimated Mix	Proposed Dwelling Units (du)	Ratio (sf/du)	Estimated PDO Reqt. (acres)
Single-Family	25%	2,500	350	20
Multi-Family	<u>75%</u>	<u>7,500</u>	<u>110</u>	<u>19</u>
Total	100%	10,000	170	39

The Development Plan Common Provisions require that "Suburban and new development areas shall include land for open space and recreation purposes at a minimum of two acres

per thousand persons" (Section 24-1.5(a)(2)(c)). Given a projected ultimate residential population of just under 30,000 residents, a minimum of 60 acres of open space and recreation areas will ultimately be required.

Mitigation

The project provides two 10-acre neighborhood park sites and a 25-acre district park for a total of 45 acres of dedicated park land. Additional open space and park areas will be provided and maintained by homeowners associations within the project.

6.8 Police Protection

Existing Conditions

The area is presently served by the Pearl City Police Station in the Honolulu Police Department's District 3. The Pearl City station services the area from Red Hill to Kahe Point. There are five beats in the Ewa area with one officer per beat, 24 hours a day, seven days a week. The police officers assigned to the Ewa area work with the community through two channels: the volunteer Neighborhood Security Watch and the Community Policing Team, the latter an effort to directly involve the community with crime prevention efforts.

Future Without Project

Because of the anticipated growth in the Ewa area, in 1995-1996, the number of police beats in Ewa will increase from five to nine, and the officers on duty will increase to 22. A Kapolei regional station is planned as the headquarters for a new District 8.

Probable Impacts

The addition of up to 10,000 residential units and up to 28,000 new residents over a 15-year period will increase the demand for police services--officers on call--but is not expected to create demand for new facilities (i.e., stations).

It is estimated that the East Kapolei project will require less than two Police Department personnel per 1,000 residents, or up to 55 Police Department personnel (in all branches of the Department) after the project is fully occupied. The East Kapolei project will not attract additional people to the island; but will provide new homes in a new community for Hawaii's growing population. Therefore, the need for police services in the project area is not an impact of the project, but simply a consequence of expected population growth. (Community Resources, Inc. 1994).

6.9 Fire Protection

Existing Conditions

The Ewa area is served by three fire stations: Makakilo Station, serving Makakilo, upper Kapolei and Ko Olina Estates; the Waipahu Station, serving lower Kapolei, Ewa by Gentry and Ewa area to Renton Road; and the Ewa Beach Station, serving all of lower Ewa Beach up to Renton Road. The Waipahu Station, which has 23 firefighters, assists the Ewa Beach Station when necessary.

Future Without Project

A new fire station is under construction in the Kapolei Business Park (approx. 3.5 miles southwest of the project site) to serve the Ewa plain. The fire station will be fully equipped and staffed, and will be adequate to serve the proposed project. Plans are also being developed for a new fire station in the Waikele area which should be open in 1997, funds permitting. (Correspondence from Chief Richard R. Seto-Mook, December 14, 1994).

Probable Impacts

The project will increase demand on existing fire protection facilities. The Fire Department captains have indicated that the increased need for fire protection resulting from the proposed project will be easily met by the planned Kapolei Fire Station. (Community Resources, Inc. 1994).

6.10 Power and Communications

A consolidated duct system consisting of ducts, manholes, handholes, pullboxes, and equipment pads will be installed for the electric, telephone, cable television and street lighting systems. It is anticipated that there will be two major trunks for the duct system to serve the East Kapolei Project. One trunk will start from Farrington Highway and go south through the center of the development along the main collector road, and the second trunk will go south from Farrington Highway along the North-South Road. Duct lines branching off the main trunks will extend along the collector and smaller roadways to serve the individual facilities.

6.10.1 Electrical System

Hawaiian Electric Company's Ewa Substation is located on the north side of Farrington Highway near the northernmost corner of the development. It is supplied by 46 kV lines from the East and North. The Ewa Substation will ultimately be replaced by the new Ewa Nui Substation which will be constructed just west of it on Farrington Highway. New aerial 138 kV transmission lines will be installed between the Ewa Nui Substation and Campbell Industrial Park. These lines will run southwest along Farrington Highway from

the new substation and then go south along the proposed North-South Road Energy Corridor.

The total electrical power requirement for the entire 1,044-acre project is estimated at 40 MVA. It is anticipated that HECO's proposed Ewa Nui Substation will serve the East Kapolei Project. Distribution circuits will originate from the substation and enter the new development from Farrington Highway, and will be routed along the major corridors to serve the development. Underground duct systems will be required along all the roadways, and easements for the installation of switches and transformers will also be required.

All roadways which will ultimately be dedicated to the State of Hawaii or the City and County of Honolulu will be illuminated in accordance with their standards. Generally, street lighting luminaries of the "cobra-head" design will be installed on galvanized steel poles.

6.10.2 Communications

Telephone System. GTE Hawaiian Telephone Company intends to serve the development by bringing its cable system in from Farrington Highway. GTE Hawaiian Tel must construct a new central office building to serve the development, and have requested a 150' x 150' lot for this purpose. The central office building will house new switching and related equipment. GTE Hawaiian Telephone Company has requested that the lot for the central office be located near the intersection of the main collector road which runs through the East Kapolei Project and the North-South Road.

Telephone cables will originate from the central office and will be installed in underground duct systems to serve the development. In addition to the underground duct line system, the telephone company requires easements for their cross-connect equipment. One cross-connect easement will be required for each ground of about 500 homes and for each commercial area.

Cable Television System. Oceanic Cablevision will serve the new development by installing its cables in an underground duct system which parallels the electrical and telephone duct systems. They will require easements for their equipment power supplies throughout the subdivision. At the writing of this report, they had not determined where cable service will enter the development.

6.11 Health Care Facilities

Existing Conditions

Saint Francis-West Medical Center is the full-service hospital closest to the proposed project. The hospital is approximately five to 15 minutes from the site, depending on traffic conditions. St. Francis-West provides a full range of hospital services, including emergency care, outpatient treatment, laboratory and x-ray facilities and medical offices. The hospital has 79 licensed beds available and has plans to expand capacity to 84 beds. Ambulance service is coordinated with the City and County and the hospital has a helipad for medivac transport.

Other medical facilities within a 20 to 30 minute drive include the Waianae Coast Comprehensive Health Center, Pali Momi Medical Center at Pearlridge, and Wahiawa General Hospital.

Non-emergency services are provided by local general physicians.

Probable Impacts

The increased population associated with the project will increase demand on existing medical care facilities. According to St. Francis-West staff, the demand for hospital service by project residents can be accommodated by the hospital. This is due to the fact that the facility can be readily expanded and that the length of stay by traditional hospital users (e.g., women giving birth) has declined in recent years and is projected to decline even further in the future. (Community Resources, Inc., November 1994).

7.

ALTERNATIVES TO THE PROPOSED ACTION

CHAPTER 7 ALTERNATIVES TO THE PROPOSED ACTION

Chapter 200 of Title 11, Environmental Impact Statement Rules, requires a discussion of "any known alternatives...which could feasibly attain the objectives of the action." The rules further specify that the alternatives be explored and evaluated in light of enhancement to environmental quality or the avoidance or reduction of adverse environmental effects. As stated in Section 2.4, the objective of the action (Ewa DP Land Use Map amendment) is to allow the development of up to 10,000 residential units and associated commercial, school and recreational facilities.

Several alternatives were analyzed including: no-action, commercial development and major public facilities development. A review of each alternative is presented below.

7.1 No-Action

The no-action alternative analyzes the impacts of taking no-action; which for purposes of this EIS, simply assumes that the East Kapolei project is not proposed on the present site. As previously discussed, the lower 500 acres of the site is owned by the State of Hawaii with the remainder of the site owned by the Estate of James Campbell (EJC). The present lessee, Oahu Sugar Company will completely close down its operations in the very near future, leaving the land vacant and available for alternative uses. Without the present East Kapolei project, and with the present lessee gone, the landowners would need to assume direct management control of the lands. The State of Hawaii is encouraging short-term agricultural uses on its lands to cover land management costs (security, fire control, drainage, etc.) and support public policy objectives relating to diversified agriculture. It is conceivable that the EJC may do the same to maintain its agricultural property tax exemptions and to at least partially offset its land management costs. In the mid- to long-term however, in view of the closure of the sugar plantation, State and City plans to develop Kapolei as Oahu's second city, and the strategic location of the site relative to the proposed University, North-South Road and the existing Farrington Highway, it is clear that the site has significant urban development potential which both landowners recognize. Thus, if no-action is taken by the applicant, it is likely that new developers will take the applicant's place and make similar proposals to develop the site.

The no-action alternative would therefore only delay the urbanization of the site. It would of course not preserve the existing sugarcane cultivation, nor would it likely preserve the open space and views associated with its present agricultural use. The loss of the site for agricultural purposes resulting from its urbanization has been fully discussed in Section 5.6 and it is concluded that the impact to agriculture would be not be significant.

An indirect impact of the no-action alternative could be the loss of agricultural land in Central Oahu if the present land exchange agreement is not consummated. The 500-acre Phase 1 of the property is part of a land exchange for 2,200 acres of agricultural (pineapple) land in Poamoho, Central Oahu, farmed by Del Monte, and managed by Hawaiian Trust Company, Ltd. for the Galbraith Trust Estate. Although the Central Oahu site was at one time proposed for residential development, the Kapolei area was considered to be a more appropriate location for housing. As a result, a land exchange agreement was consummated with the State of Hawaii, with the State's interest being the preservation of Central Oahu agricultural lands and the development needed affordable housing in Kapolei. If the land exchange agreement is not consummated (i.e., through "no-action"), the applicant would again seek to develop its Central Oahu lands. This could disrupt ongoing pineapple cultivation on the Poamoho lands, requiring the grower to relocate to new fields in order to continue its pineapple cultivation.

7.2 Commercial Development

Commercial development is an alternative which was considered but eliminated. Regional retail commercial use would have similar, but somewhat greater environmental impacts in terms of urbanization and infrastructure demand. Traffic impacts, in particular, would be greater than the proposed project. Although the Ewa-Kapolei region is experiencing much population growth which could possibly support commercial/retail development, a condition of the sale of the subject property by the Estate of James Campbell (EJC) was that commercial acreage would be limited to two acres for every 1,000 housing units constructed, not including the 27-acre commercial parcel in the Phase 2 area that the EJC will be developing adjacent to Farrington Highway. In addition, EJC is developing the nearby City of Kapolei, which includes a large retail commercial area, to support the growing regional population. The City of Kapolei provides a more centralized location for regional commercial development which is consistent with the long range land use plans for the second city. Development of major commercial uses on the site would place undue and perhaps destructive competitive pressures on the new City of Kapolei, possibly jeopardizing State and County policies to support the growth of the second city. As a result, the alternative for extensive commercial development of the site was discarded.

7.3 Major Public Facilities

The University of Hawaii Board of Regents has been seeking a site for a West Oahu campus to support the growing population in the Central Oahu and Ewa regions. The university development would also likely include associated residential and support facilities. Although the subject site provides sufficient acreage and an accessible location for a university, the State has already identified an adjacent parcel, located to the west of the site, for development of the university campus. A site for a new high school has

already been identified to the southwest of the project area. Other regional public facilities and civic uses such as police and fire stations, libraries, government and commercial offices, etc., are being planned within the City of Kapolei. According to the EJC's Long Range Master Plan, the City is to be the primary commercial and civic center for the Ewa area, providing regional support to the surrounding residential communities. The development of public facilities at the subject site would be contrary to the concept of consolidating public services and facilities in the City. Therefore, development of major public facilities on the project site was perceived as being inconsistent with the Long Range Master Plan and was eliminated as an alternative.

7.4 Conclusion

Three alternative development scenarios were analyzed, including a no-action scenario. All three alternatives had the potential for equal or greater adverse environmental impact compared to the recommended plan of constructing 10,000 homes on the site. Furthermore, and perhaps most importantly, none of the alternatives supports the State and County policies to develop Kapolei as the second city more than the recommended plan. The No-Action alternative would only delay development of the site and would put additional development pressure on Central Oahu agricultural lands. The Commercial Development scenario would threaten the success of the City of Kapolei with undue competitive pressures and would significantly increase regional traffic impacts. The development of Major Public Facilities on the site such as universities, regional libraries, police and fire stations, etc., is not feasible as these facilities are already being planned or constructed in nearby areas.

8.

IRREVERSIBLE AND IRRETRIEVABLE
COMMITMENTS OF RESOURCES

**CHAPTER 8
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Chapter 200 of Title 11, Environmental Impact Statement Rules (11-200-17(k)) requires the "identification of unavoidable impacts and the extent to which the action makes use of non-renewable resources during phases of the action , or irreversibly curtails the range of potential uses of the environment.."

The construction of the proposed project will result in an irreversible and irretrievable commitment of capital, land, labor and energy for the design and development of the project. The commitment of these resources, however, should be evaluated in light of expected benefits to the community accruing from the project.

The development of the project will transform the subject property from its present agricultural state to an urban environment. However, Oahu Sugar Company had existing plans to cease cultivation on the site, even without the proposed development. In addition, there is ample prime agricultural land in other locations for diversified agriculture on Oahu. The housing opportunities provided by the project, the associated employment created and public tax revenues generated appear to justify the loss of agricultural land.

The development of up to 10,000 residential units will create a demand on potable water source and will contribute to regional demands on wastewater and other infrastructure systems.

The project will not require any new commitment of publicly supported services and facilities that will not be compensated by increases in tax revenues.

9.

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES
OF THE ENVIRONMENT AND MAINTENANCE AND
ENHANCEMENT OF LONG-TERM PRODUCTIVITY

**CHAPTER 9
RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE
ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-
TERM PRODUCTIVITY**

Chapter 200 of Title 11, Environmental Impact Statement Rules (11-200-17(j)) requires a brief discussion of the "extent to which the proposed action involves tradeoffs between short-term losses and long-term losses or vice-versa, and a discussion of the extent to which the proposed action forecloses future options, narrows the range of beneficial uses of the environment, or poses long-term risks to health or safety..."

Short-term tradeoffs related to the proposed action are associated with the development of urban uses on the property. The project area consists of undeveloped, sugar cane fields, and provides open space and the potential for alternative future uses. The proposed action will commit the site to a particular urban use thereby potentially "narrowing the range of [potential] beneficial uses" and possibly foreclosing future options. However, the project will provide a significant number of affordable housing units, addressing an acknowledged existing and projected shortfall in the Ewa area.

Long-term impacts associated with the project are expected to be favorable, given that the project is consistent with State and City growth policies to establish a secondary urban center in Ewa. Any short-term construction-related impacts will be mitigated by the *enhancement of long-term productivity of the site.*

10.

REFERENCES

**CHAPTER 10
REFERENCES**

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- Decision Analysts Hawaii, Inc. *East Kapolei Project: Impact on Agriculture*. September 1994.
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Nance, Tom. Water Resource Engineering. *Potable Water Master Plan for the East Kapolei Area.* October 1994.

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Pacific Planning and Engineering, Inc. *Traffic Impact Assessment Report for East Kapolei Project.* October 1994.

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United States Department of Agriculture, Soil Conservation Service. *Soil Survey of Islands of Kauai, Oahu, Molokai and Lanai, State of Hawaii.* August 1972.

11.

PREPARERS OF THE EIS

**CHAPTER 11
PREPARERS OF THE EIS**

The EIS was prepared for the applicant, Schuler Homes, Inc. and Hawaiian Trust Company, Ltd., by Helber Hastert & Fee, Planners. The following list identifies individuals and organizations involved in the preparation of this report and their respective contributions.

Schuler Homes, Inc.

Mr. Mike Angotti, Director of Land Services

Helber Hastert & Fee, Planners

Thomas A. Fee, AICP (Principal-in-charge and Project Manager)

Leslie Kurisaki (Principal Author)

Technical Consultants

<u>Consultant</u>	<u>Technical Area</u>
Gail W. Atwater, AICP Community Resources, Inc.	Market Assessment Socio-Economic/Fiscal Assessment
Darby and Associates Decision Analysts Hawaii, Inc. Evangeline Funk, Ph.D. Gray, Hong, Bills & Associates, Inc.	Acoustical Engineering Agriculture Biological Resources Drainage, Wastewater, Electrical, Solid Waste and Civil
J.W. Morrow, Environmental Management Consultant Tom Nance, Water Resources Engineering Pacific Planning and Engineering, Inc.	Air Quality Potable Water Master Plan Traffic Impact Assessment

12.

PRE-ASSESSMENT CONSULTATION

**CHAPTER 12
PRE-ASSESSMENT CONSULTATION**

As part of the pre-assessment consultation provisions contained in Hawaii Administrative Rules, 11-200-9(a), a number of agencies, organizations and individuals were consulted during the preparation of the environmental assessment/EIS preparation notice and supporting studies. A listing of these contacts is provided below:

State Agencies

Department of Land and Natural Resources

Chairman's Office

State Historic Preservation Division

Department of Business, Economic Development and Tourism

Land Use Commission

Department of Health

Department of Transportation

Department of Education

University of Hawaii

Mr. Ralph Horii, Senior Vice President For Administration

City and County of Honolulu

Planning Department

Department of Transportation Services

Board of Water Supply

Department of Parks and Recreation

Department of Public Works

Department of Wastewater Management

Department of Housing and Community Development

Police Department

Public Utilities

Hawaiian Electric Company, Inc.

GTE Hawaiian Telephone Company, Inc.

Other Agencies, Organizations and Individuals

State Senator Brian Kanno

State Representative Annelie Amaral

City Councilchair John DeSoto

Ewa Neighborhood Board

13.

DRAFT EIS CONSULTATION CORRESPONDENCE

CHAPTER 13
DRAFT EIS CONSULTATION CORRESPONDENCE

The City and County of Honolulu Planning Department (accepting authority) determined that the proposed project may have a significant effect on the environment. On November 10, 1994, the Planning Department notified the Office of Environmental Quality Control (OEQC) that it had determined that an EIS was required for the subject project. This notice of determination is reproduced in this chapter. An EIS Preparation Notice (EISPN) was subsequently published in the November 23, 1994 edition of the OEQC Bulletin. The publication of the EISPN began a 30-day public review period which ended on December 23, 1994. A copy of the EISPN was mailed to 79 agencies, organizations and individuals listed below. The list contains parties believed to have an interest in the project.

By the date of publication of the Draft EIS (January 1995), a total of 23 agencies, organizations or individuals provided written comments on the EISPN. The parties who responded to the EISPN are identified by an asterisk (*) and their respective comments are reproduced in the following pages. A listing of agencies, organizations and individuals consulted during the pre-assessment period (during preparation of the environmental assessment/EISPN) is included in Chapter 12.

Federal Agencies

- * Army Engineer District
Department of the Interior, U.S. Fish & Wildlife Service
Department of the Interior, U.S. Geological Survey
Department of Commerce, National Marine Fisheries Service
- * Department of Transportation, U.S. Coast Guard
Environmental Protection Agency
Department of Agriculture

State Agencies

- * Department of Accounting and General Services
Department of Agriculture
Department of Business, Economic Development and Tourism:
 - * Director
- * Land Use Commission
- * Energy Division
- Department of Defense
- * Department of Education
- * Housing Finance and Development Corporation
- Department of Health:
 - * Director
Environmental Management Division
Office of Environmental Quality Control
- Department of Hawaiian Home Lands
- Department of Human Services

- * Department of Labor and Industrial Relations
- Department of Land and Natural Resources:
 - Chairman's Office
- * State Historic Preservation Division
- Commission on Water Resource Management
- Office of State Planning
- Department of Transportation
- Office of Hawaiian Affairs

University of Hawaii

- * Mr. Ralph Horii, Senior Vice President For Administration
- Water Resources Research Center
- Environmental Center

City and County of Honolulu

- * Building Department
- * Board of Water Supply
- Department of Finance
- * Fire Department
- * Department of Housing and Community Development
- Department of Human Resources
- * Department of Land Utilization
- * Department of Parks and Recreation
- * Planning Department
- * Department of Public Works
- Oahu Metropolitan Planning Organization
- Police Department
- Oahu Civil Defense Agency
- * Department of Transportation Services
- * Department of Wastewater Management

Public Utilities

Hawaiian Electric Company, Inc.
GTE Hawaiian Telephone Company, Inc.
Oceanic Cable
The Gas Company

Other Agencies, Organizations and Individuals

Estate of James Campbell
State Senator Brian Kanno
State Representative Annelle Amaral
City Council Chair John DeSoto
American Lung Association
Ewa Elementary School PTA

Ewa Beach Community Association
Ewa Neighborhood Board
Friends for Ewa
Ewa Village Community Association
Ahahui Siwila Hawaii O Kapolei
Friendship Bible Church
* Haseko (Ewa), Inc.
Honokai Hale/Nanakai Gardens Community Assn.
Hui Aloha Senior Citizens

Other Agencies, Organizations and Individuals (cont'd)

Kaleiopuu Elementary School PTA
Kapolei Community Assn.
Kapolei Elementary School PTA
Makakilo School PTA
Makakilo Lions Club
Makakilo Elementary School
Makakilo Senior Citizens Club
Palehua Community Association
Puuloa Hawaiian Civic Club
Thompson Senior Village
Village Park Community Association
Westloch Fairways Community Association
Westloch Estates Community Association
West Oahu Employment Corporation
Ms. Martha Makaiwi
Mr. Tony Bise
Ms. Jane Ross
Ms. Eleanor Niino



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

REPLY TO
ATTENTION OF

December 22, 1994

Planning Division

JAN -- 3 1995

Ms. Leslie Kurisaki, Project Planner
Helber Hastert Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

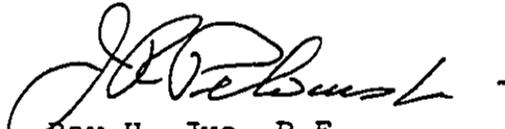
Dear Ms. Kurisaki:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice (EISPN) for the East Kapolei Project, Oahu. The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. Our Regulatory Branch staff is currently reviewing the document and will provide their comments to your office under separate cover.

b. The flood hazard information provided on page 10 of the EISPN is correct.

Sincerely,


Ray H. Jyo, P.E.
Director of Engineering

Helber Hastert
Planners

January 6, 1995

Mr. Ray H. Jyo, P.E.
Director of Engineering
Department of the Army
U.S. Army Engineer District
Fort Shafter, Hawaii 96858-5440



Dear Mr. Jyo:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 22, 1994 in response to the above-referenced EISPN, verifying the flood hazard information for the project. We are awaiting comments from your Regulatory Branch under separate cover. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

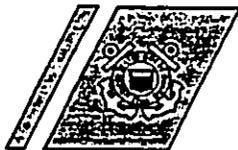
Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

U. S. Department
of Transportation

United States
Coast Guard



Commander (dpl)
Fourteenth Coast Guard District

Prince Kalaniana'ole Fed Bldg
300 Ala Moana Blvd
Honolulu, HI 96850-4982
Phone: (808) 541-2126

16502
20 December 1994

Helber Hastert & Fee
Attn: Ms. Leslie Kurisaki
733 Bishop Street, Suite 2590
Honolulu, HI 96813

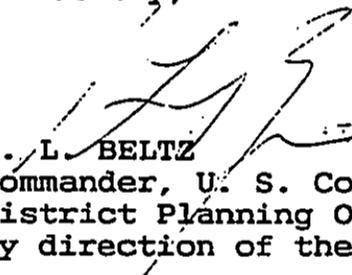
JAN 3 1995

Gentlemen:

As requested in your letter of November 28, 1994, I have reviewed the Environmental Impact Statement Preparation Notice (EISPN) for the East Kapolei Project in Ewa, Oahu. At this time, the Coast Guard has no objection to the proposal or the scope of the project. However, I reserve the right to comment further, pending the outcome of the reuse plans for U. S. Naval Air Station Barbers Point. This outcome may effect Coast Guard air operations in the area and it would be premature to speculate now on any potential impacts the East Kapolei Project could have on future Coast Guard operations.

If you require further assistance or have any questions, please contact LT Susan Papuga at (808) 541-2268.

Sincerely,


T. L. BELTZ
Commander, U. S. Coast Guard
District Planning Officer
By direction of the District Commander

Copy: CCGD14(osr)

Helber Hastert
Planners

January 6, 1995



Commander T.L. Beltz
District Planning Officer
U.S. Department of Transportation
U.S. Coast Guard
Fourteenth Coast Guard District
300 Ala Moana Blvd.
Honolulu, Hawaii 96850-2126

Dear Commander Beltz:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 20, 1994 in response to the above-referenced EISPN. We acknowledge that the Coast Guard has no objection to the proposal or scope of the project at this time. We also acknowledge that you may comment further at a later date, pending the outcome of the reuse plans for NAS Barbers Point, which may affect Coast Guard air operations in the area. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
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BENJAMIN J. CAYETANO
GOVERNOR



ROBERT P. TAKUSHI
COMPTROLLER

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

LETTER NO. (P) 2070.4

DEC 21 1994

Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

DEC 22 1994

Attention: Ms. Leslie Kurisaki

Gentlemen:

Subject: East Kapolei Project
Ewa, Oahu, Hawaii
EIS Preparation Notice

Thank you for the opportunity to review the subject document. We recommend that the developer coordinate with the Department of Education regarding the need for two elementary schools and the areas set aside for them. As we understand it, the required area for an elementary school is a total of 12 acres or 8 acres if it is adjacent to a County park of a minimum of 4 acres.

If there are any questions, please call Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Gordon Matsuoka".

GORDON MATSUOKA
State Public Works Engineer

RY:jy

Helber Hastert
Planners

January 6, 1995

Mr. Gordon Matsuoka, State Public Works Engineer
State of Hawaii
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawaii 96810



Dear Mr. Matsuoka:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 21, 1994 with comments on the above-referenced EISPN. Since publication of the EISPN, the preliminary concept plan for the project has been revised. The two elementary school sites in Phase 1 and 2 have increased in size to 8 acres each. We would also like to note that both school sites are located adjacent to a neighborhood park of 10 acres in size.

We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 11th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2406 Fax: (808) 586-2377

JOHN WAHEE
Governor
JEANNE K. SCHULTZ
Director
RICK EGGED
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

December 6, 1994

DEC 12 1994

Mr. Leslie Kurisaki
Project Planner
Helber Hastert & Fee
733 Bishop Street, Suite 2590
Grosvenor Center, Makai Tower
Honolulu, Hawaii 96813

Dear Mr. Kurisaki:

The Department of Business, Economic Development & Tourism is pleased to submit the enclosed comments on the Environmental Impact Statement Preparation Notice (EISPN) for the East Kapolei Project.

The comments were provided by the Land Use Commission. Questions regarding these comments may be directed to Esther Ueda, LUC Executive Officer, at 587-3826.

Thank you for the opportunity to comment.

Sincerely,


Jeanne K. Schultz

Enclosure

JOHN WAIHEE
GOVERNOR



ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822

December 5, 1994

SUBJECT: Director's Referral No. 94-349-B
Environmental Impact Statement Preparation
Notice (EISPN) for the East Kapolei Project,
Ewa, Oahu, Hawaii

We have reviewed the EISPN for the subject project, and have the following comments:

- 1) We confirm that the project site, TMK No.: 9-1-17: 4 (por.), is located within the State Land Use Agricultural District.
- 2) We also confirm that the Office of State Planning filed a State Land Use District Boundary Amendment Petition (LUC Docket No. A94-708) on September 19, 1994 to reclassify approximately 1,300 acres (which includes the 500-acre Phase I portion of the project) from the Agricultural District to the Urban District for the State of Hawaii/Galbraith Trust land exchange, University of Hawaii - West Oahu campus, housing, and public facility uses.

For your information, the Land Use Commission's Hearing Officer, Benjamin M. Matsubara, will conduct a hearing on the Petition on December 9, 1994, in Honolulu, Hawaii.

- 3) We understand that Schuler Homes, Inc. intends to file a State Land Use District Boundary Amendment Petition with the Commission for the 544-acre Phase II portion of the project in the near future.
- 4) We suggest that the Draft Environmental Impact Statement include a map showing the project site in relation to the State Land Use Districts.

We have no other comments to offer at this time.

EU:BS:th

Helber Hastert
Planners

January 6, 1995



Ms. Jeanne K. Schultz, Director
State of Hawaii
Department of Business, Economic Development and Tourism
220 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Ms. Schultz:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 6, 1994 with comments from the Land Use Commission on the above-referenced EISPN. You are correct that Schuler Homes, Inc. intends to file a State Land Use District Boundary Amendment Petition for the Phase 2 portion of the project area in the near future. As suggested, the Draft EIS will include a map showing the project site in relation to the State Land Use Districts.

We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



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

BENJAMIN J. CAYETANO
Governor
JEANNE SCHULTZ
Director
RICK EGGED
Deputy Director

ENERGY DIVISION, 335 MERCHANT ST., RM. 110, HONOLULU, HAWAII 96813 PHONE: (808) 587-3800 FAX: (808) 587-3820

December 9, 1994

Ms. Leslie Kurisaki
Project Planner
Helber Hastert & Fee
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

DEC 20 1994

Dear Ms. Kurisaki:

**Subject: East Kapolei Project, Environmental Impact
Statement Preparation Notice (EISPN)**

Thank you for the opportunity to comment on the proposed East Kapolei residential development of multi-family apartments, townhomes and single family homes.

Draft Environmental Impact Statements should comply with the requirements found in State laws for evaluating any energy impacts that the project will have. The mandate for such an evaluation is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226 HRS ("Hawaii State Planning Act"). In particular, Chapter 226-18(a)(2) and (c)(3); 226-52(a)(2) and (b)(2)(D); and 226-103(f)(1) and (2) should be noted.

We also call your attention to the Model Energy Code, developed under the auspices of this department, which provides for energy efficiency in the residential sector. We urge that you use the code as a guide to design for energy efficiency in this project. If you need copies of the code, please contact Mr. Howard Wiig at 587-3811.

Sincerely,

Maurice H. Kaya
Energy Program Administrator

MHK/ER:do

Helber Hastert
Planners

January 4, 1995



Mr. Maurice H. Kaya
Energy Program Administrator
Department of Business, Economic Development & Tourism
Energy Division
335 Merchant Street, Rm. 110
Honolulu, Hawaii 96813

Dear Mr. Kaya:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 9, 1994 with comments on the above-referenced EISPN.

The Draft EIS will evaluate the proposed project's energy impacts in relationship to the Hawaii State Plan (Chapter 226, HRS); in particular, Chapter 226-18(a)(2) and (c)(3); 226-52(a)(2) and (b)(2)(D); and 226-103(f)(1) and (2).

The Model Energy Code will be used as a guide for energy efficient project design as the project moves into a more detailed level of planning and design.

We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

BENJAMIN J. CAYETANO
GOVERNOR

HERNAN M. AIZAWA, Ph.D.
SUPERINTENDENT



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

JAN - 3 1995

OFFICE OF THE SUPERINTENDENT

December 29, 1994

Ms. Leslie Kurisaki
Project Planner
Helber, Hastert, and Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN)
East Kapolei Project - Ewa, Oahu, Hawaii

On November 4, 1994, we submitted comments to Dr. John Kirkpatrick regarding the subject project with the following projected enrollment based on 10,000 housing units:

<u>Schools</u>	<u>Grades</u>	<u>Projected Students</u>
Kapolei Elementary	K-6	1,772
Ilima Intermediate/Kapolei Inter	7-8	500
Campbell High/Kapolei High	9-12	710

The impact on the subject schools will be severe and schools may not be able to accommodate the projected number of students. The proposed and projected Capital Improvements Program (CIP) budgets for the next three bienniums are already severely strained by the lack of CIP funds to build adequate classrooms.

It is the understanding of the DOE that the projected construction schedule of the homes will begin as early as 1997 or 1998. The DOE already has a need for thirty-three (33) new schools in the next ten years at an average cost of \$20 - 25 million per elementary school, \$40 - 45 million per intermediate school and \$70 - 75 million per high school. Based on these costs, the DOE finds it extremely difficult to build new schools in one increment and must request the fair-share contribution of developers to decrease the gap between needs and available funds.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

The EISPN shows only one elementary school of six (6) acres in Table 1 and two (2) elementary sites in the preliminary concept plan. The projected enrollment figures produce a need for two elementary schools, one intermediate school, and the need to plan a second high school in the Ewa Plains. It should be mentioned that all of the secondary schools mentioned above will already be at or near capacity and the additional students from this proposed development will cause overcrowding.

At a minimum, the DOE requires two (2) elementary school sites of eight (8) usable acres if adjacent to a park of at least four (4) acres dedicated to the City and County Department of Parks and Recreation (DPR) and one intermediate school site. The intermediate school site must be eighteen (18) usable acres and the DOE does not want an adjacent DPR park. The schools in Kapolei were not originally designed to include the East Kapolei development which is an additional burden on the schools.

The DOE will oppose any preliminary concept plan if it does not include an intermediate school site in addition to the two elementary school sites shown. The location of the school sites must also meet the Educational Specifications and Standards for Facilities which indicate proper length to width ratio, acreage, traffic, and location. Location includes not being sited in flood plain or drainage areas, on land sloping more than five (5) percent, next to commercial areas, on curves of a road, within 500 feet from major roads like the north-south road, or on landfill or hazardous or toxic waste areas. The DOE would like to be involved and have the final approval of all three school sites in cooperation with the DPR as described on page 8.

To address the high school deficiency in capacity since the developer has stated that fifty (50) acres cannot be provided within the development, the DOE will require a fair-share contribution for the impact on the high school level. The cash contribution must be based on the total impact of the development on the school system in grades 9-12. The impact of 710 students represents nearly half (47 percent) of a prototype high school or approximately 28 classrooms. The cost of a new high school is presently \$70 - 75 million while elementary and intermediate schools cost about \$20 million and \$40 million apiece. Hence the developer's fair-share contribution cost will be a small fraction of the cost to build the three and one-half schools of about \$115 million created by this development.

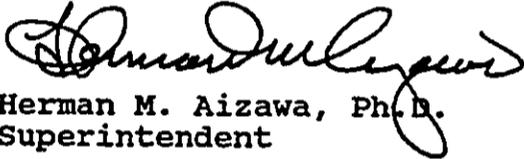
December 29, 1994

Although the timeline is over an estimated 15-year period, the long-term effects of the development require that our requests for land and cash contributions are determined prior to the granting of any subdivision approvals and/or building permits. Long-term planning is essential for the benefit of students past the turn of the century and commitments from the developers need to be resolved before any construction occurs.

The DOE cannot build all of the schools required throughout the State to address enrollment growth created by new developments. If the new schools can be built in time to accommodate the new occupants, the developers benefit from increased sales of homes and the value of the properties are increased. The school becomes a valued community resource and focal point for community activities. Therefore, our request for a fair-share contribution is important for the students, the community, the developer, and the DOE to provide the best school facilities possible with limited resources.

If there are any questions, please call the Facilities Branch at 733-4862.

Sincerely,



Herman M. Aizawa, Ph.D.
Superintendent

HMA:hy

cc: A. Suga, OBS
A. Maeda, LDO
E. Ueda, SLUC
Y. Taketa, DPR, C&C

Helber Hastert
Planners

January 6, 1995



Dr. Herman Aizawa, Ph.D.
Superintendent
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Dr. Aizawa:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 29, 1994 with comments on the above-referenced EISPN. The information you provided on projected school enrollment based on 10,000 housing units, and on the existing need for new schools will be included in the Draft EIS.

Since publication of the EISPN, the preliminary concept plan has been revised, and the two elementary school sites in Phase 1 and 2 have each been increased to 8 acres in size, as requested by the DOE. We would also like to note that both school sites are adjacent to a 10 acre neighborhood park. The park sites will be dedicated to the City and County Department of Parks and Recreation.

Schuler Homes, Inc. is willing to work with other adjacent landowners for the provision of an intermediate school site. Regarding the DOE's request for a "fair share contribution" for development of a high school, Schuler Homes, Inc. strongly believes that a State-wide standard should be established that would set forth how "fair share" is determined and how it is applied to developers. Attached is a position paper prepared by Schuler Homes, Inc. which summarizes their position on the East Kapolei school issues.

As required, the location of the elementary and intermediate school sites will meet the Educational Specifications and Standards for Facilities, which specifies site configuration, acreage, traffic and locational criteria.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Helber Hastert
Planners

Dr. Herman Aizawa
January 6, 1995
Page 2

Schuler Homes, Inc. will continue to work closely with your staff to ensure that the East Kapolei community has access to the best school facilities possible, in a timely manner. We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

Attachments

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. John Kirkpatrick, Community Resources, Inc.



SCHULER HOMES, INC.

January 6, 1995

Re: East Kapolei School Position Paper

One of the problems in responding to Dr. Aizawa's comments on "fair share" for high school impact is that no one knows what "fair share" is, yet Dr. Aizawa wants any building permits or subdivision approvals held in abeyance until agreement on school exactions on this project is reached.

Schuler Homes is prepared to contribute two elementary school sites and to work with other adjacent land owners for the providing of an intermediate school site. However, before the project can come to any agreement with the DOE as to additional contributions there should be established a standard that would set forth how "fair share" is determined on a State wide basis and how it is applied to developers. Unfortunately, the Department of Education has failed to develop any state wide position on impact fees to be imposed on developers. In fact as stated in "An Action Plan to Meet Hawaii's School Facilities Needs" prepared by MGT of America, Inc. and dated August 1994, at page xv, Recommendation number 44:

"we recommend that all of the concerned parties seek to reach an equitable resolution of the impact fee issue to ensure that both the schools and the developers have a clear understanding of the "rules of the road" in planning new facilities"

As can be seen by Dr. Aizawa's letter the DOE is requesting 2 Elementary Schools for a total of 16 acres, an Intermediate School of 18 acres and a fair share contribution to the High School. However, Schuler Homes would like to point out that an adjoining developer, Gentry Homes, only had to contribute two elementary sites for 16 acres total yet their development will comprise 8300 units. Obviously when there is no "fair share" determination of impacts on a State wide basis and every developer is faced with an ad hoc negotiation on school exactions there will be unfortunate anticompetitive effects when one development has to shoulder an unfair share of the burden of new facilities.

It is our understanding that the DOE is planning to hire a consultant to assist in determining "fair share" impact assessments upon developments. Until this task is completed and the rules of the road are established for all developers, we believe that for the DOE to request that building permits or subdivision approvals for this project be held up until agreement is reached on cash or land for a high school is unfair.

We want to point out another discrepancy in Dr. Aizawa's letter of December 29, 1994 and that is the indicated costs of Schools. He quotes for example a cost of \$20,000,000 for an elementary school but he gives no back up for the referenced costs, however, in the study by MGT of America,

referenced above, at page 1-17, exhibit 1-4, the new Kapolei Elementary School is quoted as having a total project cost of \$7,094,385 which at 45,653 square feet is \$156 a foot. If the same square footage is used for Dr. Aizawa's \$20,000,000 then the cost per square foot is an astounding \$444 per foot.

Schuler Homes is willing to participate in and be subject to fairly imposed impact fees on its developments, however it believes that when such impact fees are determined that they should be applied at the building permit stage or perhaps as a conveyance tax at the time of sale of the new units. By imposing the fees on either permits or closing fees then the anticompetitive effects of disproportionate school impositions will be avoided.

File
X

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR



HONIN FOSTER
CHIEF PLANNING OFFICER
ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

BS

November 10, 1994

Mr. Bruce Anderson, Interim Director
Office of Environmental Quality Control
State of Hawaii
Central Pacific Plaza
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Anderson:

Notice of Determination for the Proposed
East Kapolei Project
Tax Map Key 9-1-17: por. 4, Folder No. 95/E-1

This is to notify you that the Planning Department, as the accepting authority, has determined that an Environmental Impact Statement (EIS) is required for the proposed subject project. Pursuant to Section 11-200-11 of Chapter 200, Title 11 (Environmental Impact Statement Rules) of the Hawaii Administrative Rules, this EIS Preparation Notice should be published in the OEQC Bulletin.

The description of the proposed action is contained in the summary section of the attached "DOCUMENT FOR PUBLICATION IN THE OEQC BULLETIN." We have also attached four (4) copies of the Environmental Assessment.

For further information regarding the EIS, the names, addresses and phone numbers of contact persons are listed below:

Michael G. Angotti, Director of Land Services
Schuler Homes, Inc.
828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813
Phone # (808) 521-5661

Mr. Bruce Anderson, Interim Director
Office of Environmental Quality Control
November 10, 1994
Page 2

Thomas Fee, AICP
Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Grosvenor Center, Makai Tower
Honolulu, Hawaii 96813
Phone # (808) 545-2055

Should you have any questions, please call Brian Suzuki of our staff at 527-6073.

Sincerely,



ROBIN FOSTER
Chief Planning Officer

RF:ft

Attachments

OEQC BULLETIN PUBLICATION FORM

TITLE OF PROJECT: East Kapolei Project

LOCATION: ISLAND Oahu DISTRICT Ewa

TAX MAP KEY : 9-1-17: por. 4

PLEASE CHECK THE FOLLOWING CATEGORIES:

Type of Action: AGENCY _____ APPLICANT X

Applicable State or Federal Statute:

X Chapter 343, HRS _____ Chapter 205A, HRS _____ NEPA (Federal Actions Only)

Type of Document:

<input type="checkbox"/> Draft Environmental Assessment (Negative Declaration anticipated)	<input type="checkbox"/> Draft EIS	<input type="checkbox"/> NEPA NOP
<input type="checkbox"/> Final Environmental Assessment (Negative Declaration)	<input type="checkbox"/> Final EIS	<input type="checkbox"/> NEPA Draft EIS
<input checked="" type="checkbox"/> Final Environmental Assessment (EIS Preparation Notice)	<input type="checkbox"/> NEPA FONSI	<input type="checkbox"/> NEPA Final EIS

Type of Revision (if applicable):

Revised Supplemental Addendum Other (please explain)

Prior to general distribution, please submit to OEQC: 4 copies of the Draft EA, Final EA (Negative Declaration or EIS Preparation Notice), 4 copies of the Draft EIS or Final EIS (For Draft and Final EISs an additional copy is mailed to OEQC.)

PROPOSING AGENCY OR APPLICANT SHOULD SUBMIT COPIES OF THE DOCUMENTS TO THE APPROVING AGENCY OR ACCEPTING AUTHORITY PRIOR TO SUBMITTING COPIES TO OEQC.

APPROVING AGENCY OR

ACCEPTING AUTHORITY: Planning Department
City and County of Honolulu
ADDRESS: 650 South King Street
Honolulu, Hawaii 96813

CONTACT: Brian Suzuki PHONE: 527-6073

PROPOSING AGENCY OR APPLICANT: Schuler Homes, Inc., and Hawaiian Trust Co., Ltd.
ADDRESS: 828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813

CONTACT: Mr. Michael G. Angotti PHONE: 521-5661

CONSULTANT: Helber Hastert & Fee, Planners
ADDRESS: 733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

CONTACT: Mr. Tom Fee PHONE: 545-2055

COMMENT PERIOD END DATE: December 22, 1994

CONDITIONS WHICH TRIGGERED THE EIS LAW: PLEASE CHECK ALL THAT APPLY TO THE PROPOSED ACTION.

- | | |
|---|---|
| <input type="checkbox"/> Use of State or County lands or funds
HRS 343-5(a)(1) | <input type="checkbox"/> Use of lands in the Waikiki Special District
HRS 343-5(a)(5) |
| <input type="checkbox"/> Use of Conservation District Lands
HRS 343-5(a)(2) | <input checked="" type="checkbox"/> Amendment to a County General Plan
HRS 343-5(a)(6) |
| <input type="checkbox"/> Use of Shoreline Setback Area
HRS 343-5(a)(3) | <input type="checkbox"/> Reclassification of Conservation Lands
HRS 343-5(a)(7) |
| <input type="checkbox"/> Use of Historic Site or District
HRS 343-5(a)(4) | <input type="checkbox"/> Construction or modification of helicopter facilities
HRS 343-5(a)(8) |

OTHER CONDITIONS:

- Use of Special Management Area (City & County of Honolulu)
- Other* _____

* If the project does not trigger HRS 343, please explain why document is being submitted to OEQC.

SUMMARY of the proposed action or project to be published in the OEQC Bulletin. Please submit it as a summary ready for publication. The description should be brief (300 words or less), yet provide sufficient detail to convey the full impact of the proposed action.

SEE ATTACHED

NOTE: Since the deadline for EIS submittal is so close to the publication date for the OEQC Bulletin, please assist us by bringing the Document for Publication Form and a computer disk with the project description (size 3 1/2" or 5 1/4" disk are acceptable; preferably WordPerfect 5.1 or ASCII text format) to the Office of Environmental Quality Control as early as possible. Thank you.

The applicants, Schuler Homes, Inc., and Hawaiian Trust Co., Ltd., are seeking an amendment to the City and County of Honolulu's Development Plan Land Use Map for Ewa for the proposed East Kapolei project. The amendment request is proposing to redesignate approximately 1,044 acres from Agriculture to Low Density Apartment, Parks and Recreation, Public and Quasi-Public and Commercial. In addition, proposed text changes to the Ewa Development Plan Special Provisions is also being requested.

The proposed site is located in the Ewa plains and is surrounded by Farrington Highway to the north, cultivated agricultural lands to the east, the Ewa Villages residential area to the south, and by the approximate alignment of the proposed North South roadway and proposed University of Hawaii campus to the west.

The proposed project will consist of approximately 10,000 residential units to be developed over a 15-year period commencing in 1997. Other development identified in the applicant's preliminary concept plan includes: two elementary school sites, two neighborhood park sites, and three commercial shopping areas.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



PETER A. SYBINSKY, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3376
HONOLULU, HAWAII 96801

In reply, please refer to:

December 16, 1994

94-270/epo

JAN - 3 1995

Leslie Kurisaki
Project Planner
Helber Hastert & Free
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Kurisaki:

Subject: Environmental Impact Statement Preparation Notice
(EISPN)

East Kapolei Project
Kapolei, Oahu
TMK: 9-1-17: Por. 4

Thank you for allowing us to review and comment on the subject document. The Department of Health (DOH) would like to see the Draft Environmental Impact Statement address the following areas:

1. National Pollutant Discharge Elimination System (NPDES) permits that might be required.
2. Wastewater Disposal.
3. Nonpoint Source Pollution Concerns (Pollution of stream and coastal waters from erosion and surface runoff).
4. Solid Waste.
 - a. Overview of the solid waste impacts.
 - b. A conceptual plan for minimizing the generation and disposal of waste during construction and operations.
 - c. The possible participation of the developer in the funding and construction of necessary solid waste disposal and diversion facilities, on a pro-rata basis, as determined by the DOH and the County's Department of Public Works.

Leslie Kurisaki
December 16, 1994
Page 2

- d. The submittal of a detailed Integrated Waste Management Plan for the development to the County's Department of Public Works, which would address specific waste diversion programs necessary to assist in meeting the State and County reduction goals.
 - e. The use of secondary resources (recycled materials) whenever possible in the construction of the project, including but not limited to, the use of crushed glass as an aggregate substitute in road paving and the use of locally-produced greenwaste compost as a soil amendment in landscaping.
5. Water Use Permits from the Ewa Caprock Aquifer and the use of treated wastewater effluent for non-potable purposes.
 6. Noise from any noncompatible land uses and traffic patterns.
 7. Fugitive dust controls during construction and afterwards, before grass and landscaping matures.

Sincerely,


Peter A. Sybinsky, Ph.D.
Director of Health

c: CAB
CWB
WWB
OSWM
N & RB

Helber Hastert
Planners

January 9, 1995

Dr. Peter A. Sybinsky, Ph.D.
Director of Health
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801



Dear Dr. Sybinsky:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 16, 1994 with comments on the above-referenced EISPN. The following addresses the issues you have raised.

1. National Pollutant Discharge Elimination System (NPDES) permits will be required for discharges associated with temporary erosion control features implemented during grading. In addition, the storm drainage system for the project will be designed to meet City and County standards and a majority of the system is intended for dedication to the City and County of Honolulu. The project engineers will be providing information during the design phase for use by the City to include the dedicated drainage system within the City's MS4 NPDES permit. No other specific NPDES permits are known to be needed at this time. However, should the need for any arise, these permits will be obtained.
2. The Draft Environmental Impact Statement (DEIS) will include a discussion on wastewater disposal.
3. The project will require an NPDES permit, an Erosion Control Plan (ECP) and procedures and a Best Management Practices Plan to minimize the impacts of sedimentation caused by grading during construction. The intent of these plans are to provide ways to minimize the impact of erosion and surface runoff. In addition, the completed drainage system will identify the extent of the system which will be turned over to the City and implemented as part of the MS4 permit.
4. With respect to the issue of solid waste, the DEIS will contain the following:

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Hellber Hastert

Planners

Dr. Peter A. Sybinsky

January 9, 1995

Page 2

- a. A description of the existing solid waste collection and disposal systems available for the project. The DEIS will also include a description of the impacts of the solid waste produced from the East Kapolei project.
 - b. The contractors will be encouraged to reduce waste generation which minimizes waste disposal activities. Waste generation can be reduced by reusing or recycling certain construction materials such as ground cover and silt fences.
 - c. The developer will comply with all requirements of the City and County Department of Public Works related to solid waste disposal.
 - d. The developer will comply with waste diversion programs when initiated by the City and County Department of Public Works.
 - e. The contractors will be encouraged to use secondary resources such as use of crushed glass in pavement base course and locally-produced green waste compost as a soil amendment in landscaping as allowed by City and County specifications.
5. The DEIS includes a complete appendix and discussion regarding water for the project. The Board of Water Supply has determined that the project is a residential project. As such, there will be no specific requirement for use of non-potable sources such as provided by the Ewa Caprock Aquifer.
 6. The DEIS will include a discussion of noise with a noise study included in the appendix. The noise study specifically identifies non-compatible land uses and noise from traffic patterns.
 7. The DEIS includes a section on air quality and a discussion of dust control measures. The primary means for dust control will be periodic watering of exposed soil during the construction period, to minimize the release of dust.

Helber Hastert
Planners

Dr. Peter A. Sybinsky
January 9, 1995
Page 3

We appreciate your input, and will send you a copy of the Draft EIS for review and comment. The Draft EIS will include a copy of your letter.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

Attachment

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. David Bills, Gray Hong Bills & Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR



JOSEPH K. CONANT
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO:
94:PPE/6295

December 21, 1994

JAN - 3 1995

The Honorable Cheryl D. Soon
Acting Chief Planning Officer
City and County of Honolulu
Planning Department
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Environmental Impact Statement Preparation Notice
(EISPN) for East Kapolei Project, TMK# 9-1-17:por. 4,
Ewa, Oahu

We have reviewed the subject EISPN and have the following
comments to offer:

1. Additional information is needed to describe the housing component, such as the number and types, targeted income groups, and development timetable.

Policies A(3) and B(3) of the State Housing Functional Plan seek to ensure that (1) housing projects and (2) projects which impact housing provide a fair share/adequate amount of affordable homeownership or rental housing opportunities. We believe that the proposed housing project should address the affordable housing policies of the State housing plan. The EIS should fully address this issue.

We look forward to working with the applicant and the City and County of Honolulu to formulate an affordable housing program for the proposed project.

2. A description of the impact on the Department of Education's school system due to the additional homes should be addressed. At the Villages of Kapolei, two elementary schools (10 and 8 acres) and an intermediate school (20 acres) are provided for a community of



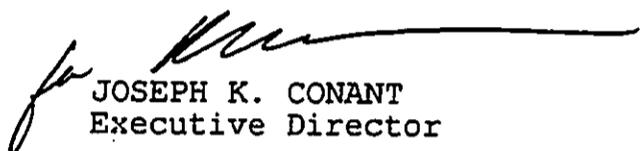
The Honorable Cheryl D. Soon
Page 2
December 21, 1994

approximately 5,000 homes. In comparison, two elementary schools on 6 acres are planned in the proposed East Kapolei project of approximately 10,000 homes.

3. Consideration should be given to the impact of the development upon the surrounding residential communities and any plans to contribute to the development of off-site infrastructure which serves the Kapolei region.
4. A description of the drainage system and open space for the project should be included in the EIS.

Thank you for the opportunity to comment on the EISPN.

Sincerely,


JOSEPH K. CONANT
Executive Director

c: Mr. Michael Angotti, Schuler Homes, Inc.
and Hawaiian Trust Co., Ltd.
Mr. Thomas Fee, Helber Hastert & Fee, Planners
OEQC

Helber Hastert
Planners

January 7, 1995

Mr. Joseph K. Conant
Executive Director
State of Hawaii
Department of Budget and Finance
Housing Finance and Development Corporation
677 Queen Street, Suite 300
Honolulu, Hawaii 96813



Dear Mr. Conant:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter to Ms. Cheryl D. Soon, Acting Chief Planning Officer, City and County of Honolulu, dated December 21, 1994 with comments on the above-referenced EISPN.

The DEIS will include additional information on the project's housing component, including the number and types of units, targeted income groups and development timetable. The project is consistent with State Housing Functional Plan policies in providing a fair share/adequate amount of affordable homeownership opportunities. The project's relationship to these policies will be discussed in the DEIS. The developer will work with the Housing Finance Development Corporation and the City and County of Honolulu to formulate an affordable housing program for the proposed project.

A description of the impact on the Department of Education (DOE) school system will be included in the DEIS. Since publication of the EISPN, the preliminary concept plan has been revised, and the two elementary school sites have each been increased to eight acres in size, as requested by the DOE. The developer is willing to work with other adjacent landowners for the provision of an intermediate school site, and is continuing discussions with the DOE over "fair share" contributions to development of a high school.

The DEIS will discuss infrastructure improvements, including a description of the proposed drainage system and open space.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Benjamin J. Cayetano
GOVERNOR



DAYTON M. NAKANELUA
DIRECTOR
ALFRED C. LARDIZABAL
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
830 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

December 15, 1994

DEC 20 1994

Ms. Leslie Kurisaki
Project Planner
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Thank you for the opportunity to comment on the Environmental Impact Statement Preparation Notice for the East Kapolei Project. As indicated in the EISPN, about 13,000 direct and 28,400 indirect and induced jobs will be generated during the construction phase (page 5). If this is so, the project will provide some much-needed employment opportunities in the construction industry and in the other sectors of the state's economy.

If you need more information or have any questions, please contact Frederick Pang, Chief of our Research and Statistics Office, at 586-8999.

Sincerely,

A handwritten signature in cursive script, reading "Dayton M. Nakanelua".
Dayton M. Nakanelua
Director

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

December 8, 1994

Leslie Kurisaki, Project Planner
Helber Haster & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Kurisaki:

LOG NO: 13309 ✓
DOC NO: 9412EJ07

SUBJECT: Environmental Impact Statement Preparation Notice:
East Kapolei Project, 'Ewa, O'ahu
Honouliuli, 'Ewa, O'ahu
TMK: 9-1-17:por. 004

Thank you for the opportunity to review this Environmental Impact Statement Preparation Notice (EISPN) for the East Kapolei Project proposed by Schuler Homes, Inc. and Hawaiian Trust Company, Ltd. The EISPN correctly incorporates our comments that we believe this project will have "no effect" on historic sites.

Sincerely,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

KEITH AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCE

DEPUTIES

JOHN P. KEPPELER II

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION

LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

DEC 16 1994

Helber Hastert
Planners

January 6, 1995



Mr. Don Hibbard, Administrator
Historic Preservation Division
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 8, 1994 responding to the above-referenced EISPN, and confirming that the project will have "no effect" on historic sites. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



UNIVERSITY OF HAWAII

SENIOR VICE PRESIDENT FOR ADMINISTRATION

December 22, 1994

JAN -- 3 1995

Ms. Leslie Kurisaki
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, HI 96813

SUBJECT: East Kapolei Project
Environmental Impact Statement Preparation Notice (EISPN)

Dear Ms. Kurisaki:

Thank you for the copy of the EISPN. We have reviewed the EISPN and have no comments to offer at this time. We would appreciate a copy of the Draft EIS to review when it is available. Thank you for letting us participate in the EIS consultation process.

Sincerely,

Handwritten signature of Ralph T. Horii, Jr.

Ralph T. Horii, Jr.
Senior Vice President for Administration

Helber Hastert
Planners

January 6, 1995



Mr. Ralph T. Horii, Jr.
Senior Vice President for Administration
University of Hawaii, Manoa
2444 Dole Street
Bachman Hall
Honolulu, Hawaii 96822

Dear Mr. Horii:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 22, 1994 in response to the above-referenced EISPN. We acknowledge that you have no comments at this time, and will send you a copy of the Draft EIS for review, as requested. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843



January 6, 1995

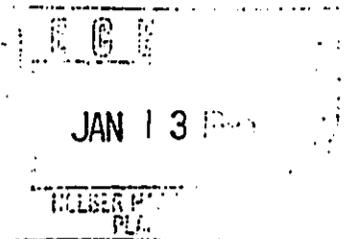
JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.

MELISSA Y.J. LUM
FORREST C. MURPHY
KENNETH E. SPRAGUE

Raymond H. Sato, Acting
Manager and Chief Engineer

Ms. Leslie Kurisaki
Helber Hastert & Fee Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813



Dear Ms. Kurisaki:

Subject: Your Letter of November 28, 1994 Regarding the Environmental Impact Statement Preparation Notice (EISPN) for the Proposed East Kapolei Project, TMK: 9-1-17: 04, Ewa, Oahu, Hawaii

Thank you for the opportunity to review and comment on the EISPN for the proposed East Kapolei Project. We have the following comments:

1. The water master plan dated November 1994 for the East Kapolei Area is currently under review.
2. The discussion in Section 6.3 should be expanded to include the necessary water system improvements as stipulated in the water master plan prepared by Water Resource Engineering, Inc., including a full discussion of the source of water supply. The impacts of the proposed water system with appropriate mitigative measures should be discussed, especially the impacts on existing groundwater sources and the aquifer's sustainable yield.
3. The EISPN should take into consideration the cumulative impacts of the university, the high school, Department of Hawaiian Homelands, and the various Campbell Mixed Use areas adjacent to the East Kapolei Project.
4. The population and water demand projections of the EISPN should coincide with the water master plan. The Development Plan Land Use Map provided in the EISPN also does not coincide with the map shown on the water master plan.
5. The Board of Water Supply (BWS) Rules and Regulations require nonpotable water as the first option for an irrigation source for large landscaped areas. Therefore, a dual water system should be thoroughly investigated to provide



Ms. Leslie Kurisaki
Page 2
January 6, 1995

nonpotable water for irrigation of large landscaped areas, common areas, and roadway landscaping. A nonpotable water master plan should be submitted to BWS if the nonpotable water system will be dedicated to BWS.

6. Water efficient landscaping should be utilized to reduce the irrigation demand.
7. The use of brackish and treated wastewater effluent as an alternative irrigation water source should be discussed in the EIS including associated health concerns and influence on the underlying caprock aquifer.
8. The proposed project is subject to our cross-connection control requirements prior to the issuance of the building permit. BWS approved reduced pressure principle backflow prevention assemblies will be required after all domestic water meters serving lots with dual water systems.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,


RAYMOND H. SATO
Acting Manager and Chief Engineer

Helber Hastert
Planners

January 17, 1995

Mr. Raymond H. Sato
Acting Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South King Street
Honolulu, Hawaii 96813



Dear Mr. Sato:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated January 6, 1995 in response to the above-referenced EISPN. We offer the following in response to your comments:

1. Since your January 6, 1995 letter, the Water Master Plan review has been completed by your agency. The project engineers will revise the master plan in conformance with BWS comments. However, they have indicated they would like to retain the proposed reservoir locations.
2. The Draft EIS includes a copy of the complete water master plan in the Appendix. This document provides a detailed description and identification of the facility needs. The report notes that approval from the Water Commission is necessary to ensure that the sustainable yield of the island's basal water aquifer is not exceeded.
3. The water master plan identifies all water demands including average daily flows and peak flows for all potential projects in the area. The East Kapolei Project, in consultation with the Board of Water Supply, has taken the lead in obtaining planning numbers from various developers or making assumptions on behalf of various developments. However, the status and timing of these projects is not available. The project engineers have, however, identified water requirements should the projects be completed, and believe that the water master plan has identified cumulative impacts with respect to water.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Heber Hastert
Planner

Mr. Raymond H. Sato
January 17, 1995
Page 2

4. The boundaries of the East Kapolei project are subject to slight modifications due to ongoing discussions with the Estate of James Campbell. We acknowledge there are slight discrepancies in project boundaries, and anticipate this will occur until final land transactions are executed. The differences do not have any effect on the impacts to water systems, mitigation measures or descriptions of the systems. In fact, the numbers provided are somewhat conservative and provide a small cushion. However, all attempts will be made to provide consistent figures and graphics.
5. The East Kapolei Project will not include golf courses or large recreational areas with the exception of the school and park sites. The project is primarily a residential development and will be treated as such with respect to potable and non-potable requirements. Other master plan users will require non-potable water and as these projects start to develop, non-potable water system master plans will be developed.
6. Schuler Homes, Inc. is noted for providing affordable, low-cost housing. All efforts are made to provide efficient construction costs and maintenance.
7. The project is primarily residential and use of reclaimed water affecting the underlying caprock aquifer will be minimal or non-existent.
8. During the preparation of construction plans, complete water system plans for each increment will be provided to the Board of Water Supply. At this time, the BWS staff provides detailed review of all cross connections including backflow preventers. This is a standard part of all Board of Water Supply construction plan approvals. The project engineers do not anticipate any of the East Kapolei residential lots having dual water systems.

Helber Hastert
Planners

Mr. Raymond H. Sato
January 17, 1995
Page 3

Should you have any questions, please contact Mr. David Bills; Gray, Hong, Bills & Associates, Inc. at 521-0306. We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. David Bills, Gray, Hong, Bills & Associates, Inc.

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI
ACTING DIRECTOR AND BUILDING SUPERINTENDENT

PB 94-1331

December 27, 1994

JAN - 4 1995

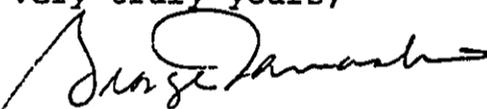
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Gentlemen:

Subject: East Kapolei Project
Environmental Impact Statement
Preparation Notice

We have reviewed the subject document and have no comments to offer at this time. Thank you for considering us in your review process.

Very truly yours,


FOR RANDALL K. FUJIKI
Acting Director and
Building Superintendent

cc: G. Tamashiro

Helber Hastert
Planners

January 6, 1995

Mr. Randall K. Fujiki
Acting Director and Building Superintendent
Building Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 66813



Dear Mr. Fujiki:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 27, 1994 in response to the above-referenced EISPN. We note that you have no comments at this time. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

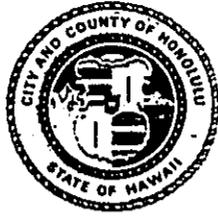
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR



RECEIVED

DEC 16 1994

RICHARD R. SETO-MOOK
FIRE CHIEF

ERNEST Y. SUEMOTO
FIRE DEPUTY CHIEF

December 14, 1994

Ms. Leslie Kurisaki, Project Planner
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: East Kapolei Project
Environmental Impact Statement Preparation Notice (EISPN)

We have reviewed the subject material provided and foresee no adverse impact in Fire Department facilities or services. Fire protection services are provided by the Makakilo and Waipahu engine companies with ladder service from Waipahu and are adequate for now. By mid-1995, the new Campbell Industrial Park Fire Station should be open and will provide additional engine and ladder service. Plans are also being developed for a new fire station in the Waikele area which should open by 1997, funds permitting.

Access for fire apparatus, water supply and building construction shall be in conformance to existing codes and standards.

Should you have any questions, please call Assistant Chief Attilio Leonardi of our Administrative Services Bureau at 831-7775.

Sincerely,

Handwritten signature of Richard R. Seto-Mook in cursive.

RICHARD R. SETO-MOOK
Fire Chief

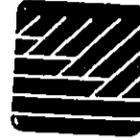
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Helber Hastert
Planners

January 6, 1995

Mr. Richard R. Seto-Mook
Fire Chief
Fire Department
City and County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869



Dear Mr. Seto-Mook:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 14, 1994 in response to the above-referenced EISPN. We acknowledge your comments that fire protection services provided by the Makakilo and Waipahu engine companies with ladder service from Waipahu are adequate for now, and that the new Campbell Industrial Park Fire Station will be in service by mid-1995. Building construction, fire access and water supply will be in conformance with existing codes and standards. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

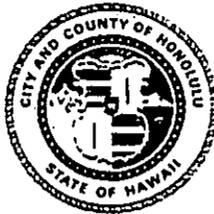
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 5TH FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4427 • FAX: (808) 527-5498

JEREMY HARRIS
MAYOR



RONALD S. LIM
DIRECTOR

ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR

December 20, 1994

JAN - 3 1995

Ms. Leslie Kurisaki
Project Planner
Helber Hastert and Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: East Kapolei Project
Environmental Impact Statement Preparation Notice (EISPN)
Tax Map Key: 9-1-17: 4

This is in response to your letter of November 28, 1994, requesting our comments on the EISPN for the proposed East Kapolei project to be developed by Schuler Homes and Hawaiian Trust Company, Ltd. The project will consist of approximately 10,000 housing units planned in two phases.

The proposed project lies in close proximity to two residential projects being developed by the City and County of Honolulu through its Department of Housing and Community Development (DHCD). The Westloch Estates and Fairways Subdivisions are located east of the proposed project site. The Ewa Villages Revitalization project, which is currently underway, borders Phase I of the project to the south.

Any large scale development adjacent to these project areas may have an impact regarding flooding of these sites. Effective measures should be taken to insure the installation of an adequate drainage system. The design of the new drainage system should ensure that the quantity of runoff reaching the upper boundary of the Ewa Villages project does not increase due to this proposed development and does not adversely affect the Ewa Villages golf course and the capacity of the West Loch Fairways detention basin. The developer is currently in communication with the Department of Public Works. Coordination with the DHCD Engineering Division should also be initiated to satisfy the necessary drainage requirements.

The EISPN states that 30% of the units will be made affordable to families earning below 120% percent of the median household income established by the U. S. Department of Housing and Urban Development (HUD). We request at least 10% of the units in the project be made affordable to households with incomes below

Mr. Leslie Kurisaki
December 20, 1994
Page 2

80% of Oahu's median income and that an additional 20% of the total units be made affordable to families with incomes between 81 and 120% of Oahu's median income, or that the developer provide a comparable option acceptable to DHCD. Please have the developer contact our Housing Development Division at 523-4264.

Should you have any questions, please contact Charlotte Yoshioka of our Planning and Analysis Division at 527-5090.

Thank you for the opportunity to comment.

Sincerely,


For RONALD S. LIM
Director

Helber Hastert
Planners

January 6, 1995

Mr. Ronald S. Lim, Director
Department of Housing and Community Development
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813



Dear Mr. Lim:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 20, 1994 with comments on the above-referenced EISPN.

Drainage

You note that the project lies in close proximity to two residential projects being developed by the City and County Department of Housing and Community Development (DHCD): West Loch Estates and Fairways subdivisions east of the project site, and the Ewa Villages Revitalization to the south. You further note that the project should include effective measures to insure the installation of an adequate drainage system, so as not to adversely impact these adjacent developments. The proposals for the project drainage system will be included in the Draft EIS for your review and comment. Schuler Homes, Inc. and their engineers will continue to work closely with the Department of Public Works and will coordinate with the DHCD Engineering Division to ensure that the project does not adversely affect the Ewa Villages golf course or the capacity of the West Loch Fairways Detention Basin.

Affordable Housing

As requested in your letter, 1,000 of the project's housing units (10%) will be affordable to households with incomes below 80 percent of Oahu's median income, and 2,000 units (20 %) will be affordable to families with incomes between 81 and 120 percent of median income.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Helber Hastert
Planners

Mr. Ronald S. Lim
January 6, 1995
Page 2

We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

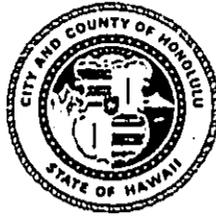
Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. Danny Hong, Gray Hong Bills
Mr. John Kirkpatrick, Community Resources, Inc.
Ms. Gail Atwater

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

JEREMY HARRIS
MAYOR

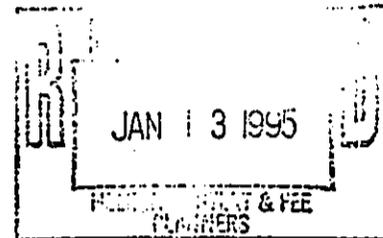


DONALD A. GREGG
DIRECTOR

LORETTA K.C. CHEE
SENIOR DIRECTOR
Acting Director
94-08622 (DT)

January 12, 1995

Ms. Leslie Kurisaki
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813



Dear Ms. Kurisaki:

Environmental Impact Statement Preparation Notice (EISPN)
For East Kapolei Project in Ewa, Oahu
Tax Map Key: 9-1-17: por. 4

We have reviewed the above-referenced EISPN and have the following comments:

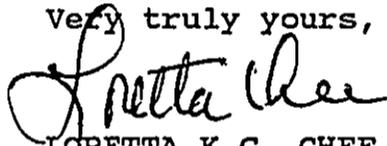
1. The different residential types stated (25 percent single-family and 75 percent multi-family) should be reflected in appropriate DP designations; or adjustment of the maximum densities permitted in Low Density Apartment Designation (LDA) from 12 dwelling units(du)/acre to 30 du/acre. Accordingly, the total dwelling units permitted through the LDA designation should be restated from 10,000 to 27,570 units.
2. The Draft EIS should demonstrate how the applicant intends to comply and enhance stated public policy for a Regional Bikeway System and the Integrated Solid Waste Management Act. We will recommend that the total land areas devoted for public use be increased, between 5 to 10 percent of the total land area, to accommodate areas for waste diversion, such as recycling and waste reduction (i.e. recycling center). This range will also ensure adequate area for park and ride or transit facilities and day care centers in each of the project phases.
3. The Draft EIS should address its relationship to existing and proposed air traffic patterns of the Barbers Point Naval Air Station. Easements required for the Aviation Protective Zone. Noise Level Contours will be required at the DP phase.

Ms. Leslie Kurisaki
Page 2
January 12, 1995

4. The Draft EIS should include a conceptual urban design plan for the subject area. Urban form impacts should also be discussed in the Draft EIS.
5. A rationale should be given for the location of one of the commercial areas in Phase 2. It is preferable that the commercial areas be relocated to a more central location within the project area, perhaps near or adjacent to a park.
6. Mitigative measures to prevent construction runoff from entering the drainage basins (which will eventually empty to the ocean) should be included in the EIS.
7. Page 7 of the EISPN mentions that a sewer system will be provided to collect all sewage and transport project-generated sewage to the Honouliuli Wastewater Treatment Plan. A detailed description and plans of this sewer system should be included in the EIS.

Thank you for the opportunity to comment. If you have any questions regarding comments 1 through 5, please contact Patrick Seguirant of our staff at 527-5369. You may contact Dana Teramoto of our staff at 523-4648 regarding comments 6 and 7.

Very truly yours,



LORETTA K.C. CHEE
Acting Director of Land Utilization

LKCC:fm
kapolei.djt

Helber Hastert
Planners

January 17, 1995

Mr. Patrick Onishi
Acting Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813



Dear Mr. Onishi:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated January 12, 1995 in response to the above-referenced EISPN. As your letter was received several weeks after the public comment period ended on December 23, 1994, we were unable to fully incorporate your comments in the Draft EIS. We offer the following responses to you letter.

1. The Draft EIS notes that the applicant has requested designation of all residential areas of the project within the Low Density Apartment DP land use category which permits three-story building heights and densities of up to 30 dwelling units per acre. The DEIS also notes that planned residential densities are projected to range from 7 to 20 dwelling units per acre, with an expected 10,000 total residential units. Due to the preliminary nature of the DP planning process and the dynamic nature of the housing market, the applicant feels it would be premature to designate specific residential density zones within the planning area. Designation of the entire residential area within the LDA category will provide the flexibility needed to implement the applicant's affordable housing objectives.
2. The applicant will be reviewing the State Bikeway Plan and related policy documents for applicability to the project. The applicant intends to comply with provisions of the State's Integrated Solid Waste Management Plan (DOH, March 1991), and waste diversion program requirements when initiated by the City and County Department of Public Works.

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Heller Hastert
Planners

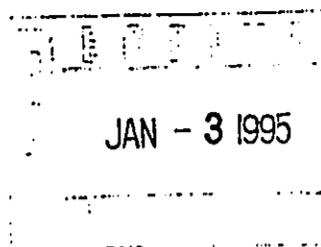
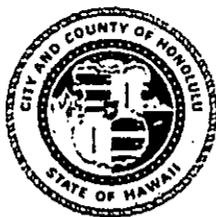
Mr. Patrick Onishi
January 17, 1995
Page 2

3. The Draft EIS discusses the project's relationship with the nearby Naval Air Station Barbers Point. As you are aware, the Barbers Point Reuse Committee is still investigating alternative uses for NAS Barbers Point, including a State general aviation reliever airport and continued use by the U.S. Coast Guard. Future off-station noise impacts and accident potential zones will depend on the actual uses selected by the Reuse Committee. At this time, we are not aware of any alternatives that would expose the project area to significant noise levels or accident potential. The DEIS includes a full noise impact assessment as an appendix.
4. The applicant will prepare a conceptual urban design plan as part of the forthcoming zoning process. General impacts of the project's proposed urban form are discussed in the DEIS.
5. The DEIS discusses the applicant's intent to reserve commercial land use siting flexibility through the DP review process for both 10-acre commercial sites. The DEIS notes that "these parcels may be developed in several smaller parcels instead of single, 10-acre parcels." Ample opportunity exists to site the commercial parcels in areas that will yield maximum convenience to local residents. Specific siting of the 10-acre commercial parcels will be fixed in the zoning process. A 27-acre commercial parcel is located in Phase 2 which is to be retained and developed by The Estate of James Campbell.
6. The Draft EIS discusses mitigative measures to prevent construction runoff from entering the drainage basins.
7. The Draft EIS describes the proposed wastewater system. The project site is part of a larger area for which a wastewater master plan is being prepared. The developer is continuing to work with the Department of Wastewater Management and will submit detailed plans for the wastewater system for their review and approval.

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
XXXXXXXXXXXX
MAYOR



DONA L. HANAKE
XXXXXXXXXXXX
DIRECTOR
ALVIN K.C. AU
DEPUTY DIRECTOR

December 21, 1994

Ms. Leslie Kurisaki
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: East Kapolei Project - Environmental Impact
Statement Preparation Notice (EISPN)
Honolulu, Oahu, Hawaii

Thank you for providing us with this opportunity to comment on the EISPN for the East Kapolei Project.

We look forward to continuing our participation as a consulted party during the preparation and review of your draft EISPN. We encourage you to continue to coordinate with our department in meeting the recreational needs of the residents in the Kapolei area. The project that you are proposing will create a large, new residential community in the Kapolei/Ewa area. The failure of a community this size to meet the basic recreational needs for its new residents will have serious implications for the entire region.

We have reviewed your proposed Development Plan Land Use Map and have found that it does not meet the City's requirements for public park space. As we have explained in previous correspondence, the Development Plan Common Provisions and the City's standards for parks indicate that a project with a projected residential population of 30,000 should provide 60 acres of park lands for public park purposes. These recreational areas should include a series of neighborhood, community, and district parks. The configuration and location of these recreational areas will also be important. It may also be in everyone's best interest to coordinate park development with the Department of Education in the development of school/park complexes wherever feasible.

Helber Hastert
Planners

January 9, 1995



Ms. Dona L. Hanaike, Director
Department of Parks and Recreation
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Hanaike:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 21, 1994 with comments on the above-referenced EISPN. Since publication of the EISPN, the preliminary concept plan has been revised, and the two neighborhood park sites in Phases 1 and 2 have each been increased to 10 acres in size. In addition, the plan now includes a 25-acre district park site along the eastern boundary of the project area for a total of 45 acres of dedicated park land. Additional open space and park areas will be provided and maintained by homeowners associations within the project.

As suggested, Schuler Homes, Inc. is coordinating the siting of park/school complexes with your department and the Department of Education. Two eight-acre elementary school sites will be located adjacent to the neighborhood parks in each of the two phases.

We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & FEE
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

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PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

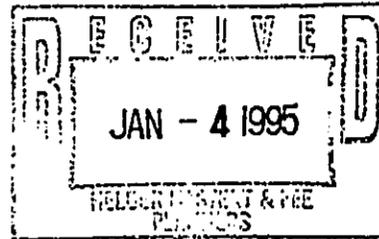


JEREMY HARRIS
MAYOR

CHERYL D. SOON
ACTING CHIEF PLANNING OFFICER
CAROLL TAKAHASHI
DEPUTY CHIEF PLANNING OFFICER

BS 11/94-4644

December 23, 1994



Helber Hastert & Fee
Grosvenor Center, PRI Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Attn: Mr. Tom Fee

Gentlemen:

Comments to the Environmental Impact Statement
Preparation Notice (EISPN), 95/E-1,
Ewa Development Plan Land Use Map Amendment Application
and Environmental Assessment, East Kapolei Project, Ewa, Oahu

In response to the Supplemental Environmental Impact Statement Preparation Notice (EISPN), dated November 23, 1994, we are submitting the following comments for the subject assessment.

This project is consistent with the City General Plan and Development Plan policies to promote development of a secondary urban center in Kapolei. While there is project consistency with policy, we find the analysis has discrepancies in the population and housing units forecasts used to justify the project as compared to those used by this department for regional planning. The Draft Environmental Impact Statement (DEIS) should provide a complete analysis of how your market assessment demand was derived and an explanation for the discrepancies in projected demand and our department's demand figures for Ewa which are explained below.

Conformance of Proposed Project to the General Plan: Population

The Environmental Assessment (EA) and Development Plan (DP) application states that a Market Assessment Report for the subject project estimated residential demand in Ewa ranging "from 52,961 to 57,474 units, between 1994 and 2010."

In the Department's Forecast of Population Housing and Employment on Oahu by Small Area 1990-2010, dated 1993, housing unit projections for 2010 show that 34,800 units could be built in Ewa based on the current Development Plan designations. However, only 16,800 housing units are forecast to be built by 2010. An additional 18,000 units could be built without redesignating any additional lands for residential use. As part of the Ewa DP Revision Program, the department has further revised its estimates of housing supply and demand for 2010 and included projections for the Year 2020. The new estimates indicate there are currently enough lands designated in Ewa to allow the construction of 32,000 additional housing units, but certainly not as many as 50,000 units. Please contact Steve Young, 527-6080, of this department to discuss these forecasts.

Table 2 in the EA shows a 2010 population forecast for Ewa of 93,112 or 9.3 percent of the islandwide population. This is well below the General Plan distribution guideline of 12.0 percent to 13.3 percent of the Oahu population. Almost 40,000 additional people could be accommodated in Ewa within the upper limits of these guidelines for 2010. The primary reason that population growth is less than expected is that Ewa developers have not been building at the rate they promised at the time their projects were approved; caused in part by competition from Central Oahu developers.

The impact of your proposed project should be expressed in terms of population, General Plan distribution guidelines, and affordability of housing units. Detailed explanation should be included in the DEIS on how the East Kapolei project will provide affordable housing. Also explain the project timetable for build-out and what assurances are there, based on your market analysis, that the project will accomplish this schedule.

Public Costs and Revenues

The DEIS should address the fiscal impact of the proposed project by including a fiscal impact analysis of all projected costs and revenues associated with the full development of the proposed project.

The assumption stated in the EA that the project will contribute to already-planned capital improvements and therefore not incur any costs to the City is not entirely correct. Many of the already-planned capital improvements in Ewa were based on the assumption that the proposed project area would be "land banked" by the State and remain in agriculture for a number of years. It is unreasonable to assume that these already-planned improvements are being over-designed and can accommodate the additional impacts related to the full development of the project.

While some public services may become more cost-effective due to the project, there may be other public services (i.e. refuse collection, etc.) that may incur additional costs due to the addition of new routes and associated equipment and manpower. The overall impact on various governmental services and facilities can only be assessed through the undertaking of a comprehensive fiscal impact analysis.

Traffic Impacts

The DEIS traffic impact analysis should address cumulative traffic impacts as well as localized traffic impacts. This should include regional transportation facilities (i.e. H-1 Freeway) as well as potential mass transit impacts.

In addition, the DEIS should address the issue of timing and construction of the North/South roadway and interim access to Phase I and Phase II. It is our understanding that the State Department of Transportation (SDOT) will not allow access to the project site via Fort Weaver Road. Will the proposed development of the North/South roadway coincide with the projected construction schedule of the proposed project?

Drainage

The DEIS should note that the drainage proposal for the proposed project is preliminary and has not received City approval. Further, the City's Department of Public Works (DPW) has indicated that they would not approve or accept the proposed concrete drainage channel for stormwater runoff that is being proposed in conjunction with the North/South roadway.

The DEIS should also address and discuss the alternatives and timing for resolution of the regional drainage problem in Kalo'i Gulch watershed. Ultimately, DPW contends that an ocean outlet is needed as a permanent solution to the Kalo'i Gulch drainage situation. Current regional plans show that a marina in the Ewa Marina project will be that outlet. However, Haseko (Ewa) Inc., the developer of the Ewa Marina project, has indicated that there is a possibility that the proposed marina may not be built. The DEIS should include a discussion of possible mitigation measures, including those mitigations needed if the marina is not built.

Park Facilities

The proposed land use plan for the project indicates the provision of only two 10-acre neighborhood park sites. The DP Common Provisions, Section 24-1.5(a)(2)(c) as cited by

Helber Hastert & Fee
December 23, 1994
Page 4

the EA requires a minimum of 2 acres per thousand persons. Based on the projected population of more than 30,000 persons from the proposed project, the DEIS should discuss how the shortfall of about 40 acres of park space will be met within the proposed project area.

Thank you for the opportunity to review and comment on the subject EISPN. We will reserve any additional comments or concerns pending the publication and review of the DEIS. Should you have any further questions on the matter, please contact Brian Suzuki of this staff at 527-6073.

Sincerely,



CHERYL D. SOON
Acting Chief Planning Officer

CDS:ft

cc: Hawaiian Trust Company, Ltd.
Schuler Homes, Inc.
Office of State Planning
The Estate of James Campbell

Helber Hastert
Planners

January 6, 1995

Ms. Cheryl D. Soon, Acting Chief Planning Officer
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813



Dear Ms. Soon:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN), 95/E-1**

Thank you for your letter dated December 23, 1994 with comments on the above-referenced EISPN. We would like to respond to your comments as follows:

Conformance of Proposed Project to the General Plan: Population

The EA states that the Market Assessment (Atwater 1994) estimated "residential demand in the Ewa study area as ranging from 52,961 to 57,474 units between 1994 and 2010." You indicate that these figures are inconsistent with your department's projections for the Ewa DP area.

First, what was called the "Ewa study area" in the EA should have been more accurately referred to as the "market study area." This "market study area" was defined in the Atwater report as the residential market located along the H-1 corridor, including the Ewa DP area plus the Central Oahu communities of Waikele and Royal Kunia. Unfortunately, the EA's use of the term "Ewa study area" caused confusion between the Ewa DP area and the larger market study area detailed in the Market Assessment.

Secondly, the "residential demand" of 52,961 to 57,474 which was cited refers to the total projected demand in the market study area between 1994 and 2010, including existing units. The projected net demand for additional units (beyond existing inventory) in the market study area is between 36,070 and 40,884 units by the year 2010, as noted in the Atwater report. To facilitate comparison to Planning Department estimates, the projected demand for additional units in the Ewa DP portion of the market study area is estimated as approximately 29,000 to 33,000 units.

Third, your review of the full Market Assessment document will show that population projections are consistent with both General Plan guidelines and unit/population forecasts published in the Forecast of Population and Housing and Employment on Oahu by Small

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Grosvenor Center, Makai Tower

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Heiber Hastert
Planner

Ms. Cheryl Soon
January 6, 1995
Page 2

Area 1990-2010, dated 1993, which was the official Planning Department forecast at the time of report preparation..

We concur that the Market Assessment findings were not clearly summarized in the EA, and have made every effort to clarify this discussion in the Draft EIS and the accompanying Market Assessment. The complete Market Assessment will be included in the Draft EIS for your review.

Public Costs and Revenues

The Socio-Economic Impact Assessment (Community Resources, Inc. 1994) which will be included in the Draft EIS includes a complete fiscal impact analysis for the proposed project. If, after reviewing the study, your Department would like additional information or further analysis of specific items, we will be happy to comply with your request.

Traffic Impacts

The overall scope of the Traffic Impact Assessment (Pacific Planning and Engineering, Inc. 1994) was developed through consultation between Schuler Homes, Inc. and the State Department of Transportation (DOT). In these meetings, specific roadways and intersections were identified by the DOT for analysis. Regional impacts extending to the H-1 Freeway ramps were requested for evaluation. Accordingly, the project's impact on the H-1 Freeway ramps, as well as the intersections adjacent to the project area, were evaluated in the Traffic Impact Assessment.

Your comment regarding mass transit is well-taken and was considered prior to the traffic study. However, transit plans would need to include the other major developments in the corridor and the Ewa region as a whole. Policy decisions regarding service preferences for the City of Kapolei and Honolulu will be a major determinant of the type and frequency of bus service for the project. These decisions will likely need to be based on budget limits for the entire region, of which the project is a small portion. The developer is committed to supporting transit within its project area, and will work jointly with the City's Department of Transportation Services as it outlines transit plans for the growing region.

The project includes an internal spine road, which will provide primary access until the proposed North/South Road is completed by the State. Final planning for the North/South Road has not yet been completed. However, the timing and construction of the North/South Road and its interface with the project will be discussed to the extent possible, given the information available from the DOT.

Helber Hastert
Planners

Ms. Cheryl Soon
January 6, 1995
Page 3

A copy of the Traffic Impact Assessment will be included in the Draft EIS for your review.

Drainage

The Draft EIS will note that the drainage proposal is preliminary and subject to review and approval by the City Department of Public Works (DPW). Per consultation with DPW, it is our understanding that drainage improvements designed and constructed in accordance with DPW standards will be accepted by the City for dedication.

The Draft EIS will address alternatives for resolution of the Kaloi Gulch regional drainage problem and mitigation measures if Ewa Marina's marina is not built.

Park Facilities

Since publication of the EISPN, the preliminary concept plan has been revised and the two neighborhood park sites in Phases 1 and 2 have each been increased to 10-acres in size. In addition, the plan now includes a 25-acre district park site along the eastern boundary of the project area, for a total of 45 acres of dedicated park land. Additional open space and park areas will be provided and maintained by homeowners associations within the project.

We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners



Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. Danny Hong, Gray Hong Bills
Mr. John Kirkpatrick, Community Resources, Inc.
Ms. Gail Atwater

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

630 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
MAYOR

KENNETH E. SPRAGUE
Acting DIRECTOR AND CHIEF ENGINEER
DARWIN J. HAMAMOTO
DEPUTY DIRECTOR
ENV 94-291

December 15, 1994

RECEIVED

DEC 20 1994

Mr. Leslie Kurisaki
Project Planner
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Kurisaki:

Subject: Environmental Impact Statement Preparation
Notice (EISPN), East Kapolei Project
Tax Map Key: 9-1-17: Por. 4

We have reviewed the subject project and have the following comments:

1. Method and location of facilities to meet required 2-year, 24-hour storm detention should be addressed.
2. Roadway improvements should be constructed in accordance with City standards and the Americans with Disability Act Accessibility Guidelines.
3. Engineering controls and best management practices (BMPs) should be incorporated in the drainage system to reduce storm water volume and runoff rates.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,


KENNETH E. SPRAGUE
Director and Chief Engineer

Helber Hastert
Planners

January 6, 1995

Mr. Kenneth E. Sprague, Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813



Dear Mr. Sprague:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 15, 1994 with comments on the above-referenced EISPN. Our responses to your comments are as follows:

1. Drainage facilities to meet the required 2-year, 24-hour storm detention will be provided for both the Kapolei Gulch and West Loch drainage basins. Use of permanent detention basins located offsite is being proposed. A separate drainage study addressing these locations has been prepared and will be submitted to the Department of Public Works for review and approval.
2. Concur. All roadway improvements shall be constructed in accordance with City standards and with the Americans with Disabilities Act Accessibility Guidelines.
3. Concur. Engineering controls and best management practices will be incorporated into the drainage system.

If you have any questions, please feel free to contact the project engineer, Mr. Daniel Hong of Gray Hong Bills & Associates, Inc. at 521-0306. We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. Daniel Hong, Gray Hong Bills & Associates

Helber Hastert & Fee
Grosvenor Center, Makai Tower

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Honolulu, Hawaii 96813

Telephone 808 545-2055
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DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

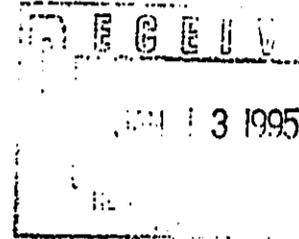


~~JEREMY HARRIS~~
~~FRANK F. FASL~~
MAYOR

CHARLES O. SWANSON
~~JOSEPH M. MAGALU, JR.~~
DIRECTOR

AMAR SAPPAL
DEPUTY DIRECTOR

January 12, 1995



Ms. Leslie Kurisaki
Project Planner
Helber, Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: East Kapolei Project
Environmental Impact Statement
Preparation Notice (EISPN)
Development Plan Amendment
TMK: 9-1-17: Por. 4

This is in response to your letter dated November 28, 1994 requesting our comments on the EISPN for the subject project.

We understand that a traffic impact study will be prepared as part of this project. We plan to provide more detailed comments upon our review of this study.

As part of the traffic impact study or subsequent report, the following issues should be addressed and provided:

1. The proposed scheduling of improvements to Farrington Highway and the "North-South" Road in relation to the development of this project. Of particular concern is the vehicular carrying capacity of Farrington Highway for the two-lane segments which fall outside the limits of this development. This may limit the extent of this development if there are no further improvements planned for these segments or if the connection to the freeway is not completed.

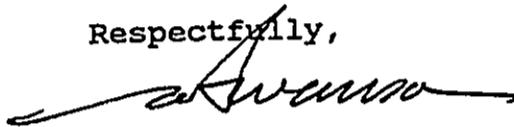
Ms. Leslie Kurisaki
Page 2
January 12, 1995

2. Schematic details at major intersections indicating laneage and the anticipated level-of-service at each approach. The analysis should include a determination of the lengths of left turn lanes and the need for separate right turn lanes.
3. The roadway cross-sections for all major streets.
4. A roadway master plan showing all major streets and the anticipated location of each street intersection.

The developer should work closely with our department during the preparation of the preliminary plans for this development.

Should you have any questions, please contact Mel Hirayama of my staff at 523-4119.

Respectfully,



CHARLES O. SWANSON
Director

Helber Hastert
Planners

January 17, 1995



Mr. Charles O. Swanson, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Mr. Swanson:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated January 12, 1995 with comments on the above-referenced EISPN. The Draft EIS includes the Traffic Impact Assessment Report as an appendix for your review and comment. We have the following responses to your comments:

The Traffic Impact Assessment states that without the North-South Road and H-2 Freeway connection, project development cannot commence much past 1,000 to 1,500 units. The project traffic study shows traffic at 50% development and 100% buildout. It is critical that the North-South Roadway and H-2 Freeway connection commence during the first phase of the East Kapolei Development.

The traffic study identifies major intersections and turning motions. The roadway cross-sections for major streets will meet City and County of Honolulu standards. All information requested, including schematic details at major intersections, roadway cross-sections and a roadway master plan showing all major streets and intersections will be provided to DTS, prior to development of construction documents.

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Planners

Mr. Charles O. Swanson
January 17, 1995
Page 2

The developer and their engineers will continue to work closely with your department during the preparation of preliminary plans for this development. We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. Jon Shimada, Pacific Planning & Engineering
Mr. David Bills, Gray Hong Bills

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS

MAYOR



JAN 3 1995

FELIX B. LIMTIACO
ACTING DIRECTOR
CHERYL K. OKUMA-SEPE
DEPUTY DIRECTOR

WPP 94-561

December 29, 1994

Ms. Leslie Kurisaki, Project Planner
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: East Kapolei Project Environmental Impact
Statement Preparation Notice (EISPN)

Thank you for your November 28, 1994 memorandum concerning the EISPN for the East Kapolei Project.

The Department of Wastewater Management will include the project-generated sewage to the Honouliuli Wastewater Treatment Plant in the West Mamala Bay Facilities Plan being prepared by a consultant.

We would like to review the draft environmental impact statement when it is completed.

Should there be any questions, please call Bill Liu from the Division of Planning and Service Control at 527-6871.

Very truly yours,

Felix B. Limtiaco
FELIX B. LIMTIACO
Acting Director

Helber Hastert
Planners

January 6, 1995

Mr. Felix B. Limtiaco, Acting Director
Department of Wastewater Management
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813



Dear Mr. Limtiaco:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 29, 1994 with comments on the above-referenced EISPN. We acknowledge that the Department of Wastewater Management will include the project generated sewage to the Honouliuli Wastewater Treatment Plant in the West Mamala Bay Facilities Plan currently being prepared.

We appreciate your response to our request for comments. Your letter will be reproduced in the Draft EIS, which will be sent to you for review and comment.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki
Project Planner

cc: Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

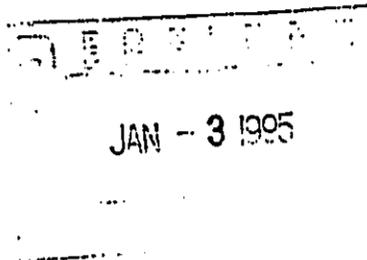
Telephone 808 545-2055
Facsimile 808 545-2050



HASEKO (Ewa), Inc.

820 Mililani Street, Suite 810, Honolulu, Hawaii 96813-2938
Phone (808) 599-1444 Fax (808) 545-5590

December 23, 1994



Mr. Tom Fee
Helbert Hastert & Fee
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Re: East Kapolei Project

Dear Mr. Fee;

Thank you for this opportunity to submit comments during the scoping period for the EIS which is being prepared for Schuler Homes East Kapolei Project.

As one of the developers of Oahu's planned secondary urban center we have followed the progress of all development on the Ewa Plain. We are particularly interested in projects that lie within the Kaloi Gulch Watershed because our Ewa Marina project lies at the seaward terminus of the Watershed. Development of any of the properties mauka of us, including the East Kapolei Project, has the potential to impact Ewa Marina.

Historically, the Kaloi Gulch watershed has been comprised mostly of sugar cane fields which facilitated infiltration of surface run-off. Even during extreme storms, very little runoff ever reached the Ewa Marina property. The runoff instead ponded in inland areas and evaporated or percolated into the ground. Under these conditions, a 100-year storm event was estimated to discharge 550 cubic feet per second (cfs) of runoff onto the Ewa Marina site. The ongoing urbanization of the watershed, however, will significantly increase surface runoff. It is estimated that at full development, a 100-year storm event could send 10,000 cfs of water onto the Ewa Marina site.

Although legally HASEKO has no obligation to address the drainage needs of any development aside from Ewa Marina, we agree with the statement made in your November 9, 1994 Environmental Assessment that "Complete resolution of

YYNEKAPOLEI

Mr. Tom Fee
December 23, 1994
Page (2)

drainage within the Kaloι Gulch drainage basin will require coordination with other projects located within the drainage basin.”

Both the State Land Use Commission and the City Council recognize that coordination and participation of all developers in the Kaloι Gulch Watershed is essential in the development and implementation of a regional drainage plan. As a condition to rezoning of properties within the watershed, developers have been mandated to cooperate in the development of plan for flood and silt control in the Kaloι Gulch Watershed.

The developers in the Kaloι Gulch Watershed have attempted to address the regional drainage issue by commissioning a group of professional engineers to study and address the drainage requirements and water quality concerns for the entire drainage basin. This committee issued a report in June 1993 recommending an interim drainage plan, which is appended to the Environmental Report attached to OSP’s Petition for land use boundary amendment. The Environmental Report suggests that this regional drainage plan has been adopted and is being implemented. To the contrary, the engineers’ report provides only an interim engineering plan which expressly does not address non-technical issues, such as responsibility for construction and maintenance of the drainage system and compensation for use of, or damages to, property. Instead, those issues were left to the developers to resolve prior to implementation of any regional drainage improvements. Despite an encouraging start at voluntary coordination efforts, virtually no progress has been made to date in resolving non-technical issues. Nor has there been any agreement as to a permanent drainage solution for the region.

HASEKO has consistently maintained that Ewa Marina cannot by itself take care of all the drainage problems in the Kaloι Gulch Watershed. To be effective, flood control plans must involve the cooperation, participation and contribution of all the developers in the Kaloι Gulch Watershed and must address such issues as detention and retention of stormwaters flows, diversion of these stormwaters to specified areas to minimize property damage, and siltation and removal of pollutants to prevent degradation of coastal waters. There are engineering solutions to these drainage concerns but resolution of this issue cannot be achieved until all affected developers agree on both the appropriate drainage infrastructure for the entire Kaloι Gulch Watershed area, and the equitable allocation of construction and maintenance costs for such infrastructure.

We encourage a discussion of these issues in the Environmental Impact Statement that is being prepared, as well as a reiteration of the need for coordination with other projects in the Kaloι Gulch Watershed. HASEKO looks forward to working with

YYNEKAPOLEI

Mr. Tom Fee
December 23, 1994
Page (3)

the developers of the East Kapolei Project in the development and implementation of a regional drainage solution.

Please feel free to contact me if you have any questions.

Very truly yours,

HASEKO (Ewa), Inc.



Vicki Gaynor
Manager
Community & Government Affairs

VG:kk
cc: Shuler Homes

YYTEKAPOLEI

Helber Hastert
Planners

January 7, 1995

Ms. Vicki Gaynor
Manager
Community and Government Affairs
Haseko (Ewa), Inc.
820 Mililani Street, Suite 810
Honolulu, Hawaii 96813-2938



Dear Ms. Gaynor:

**East Kapolei Project, Ewa, Oahu, Hawaii
Environmental Impact Statement Preparation Notice (EISPN)**

Thank you for your letter dated December 23, 1994 with comments on the above-referenced EISPN.

The project developer will continue to work with Haseko (Ewa), Inc. as well as other developers and governmental agencies to resolve the regional drainage issues. We appreciate your input, and will send you a copy of the Draft EIS for review and comment. The Draft EIS will include a copy of your letter.

Sincerely,

HELBERT HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

Attachment

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Mr. Danny Hong, Gray Hong Bills & Associates, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

14.

FINAL EIS CONSULTATION CORRESPONDENCE

CHAPTER 14
FINAL EIS CONSULTATION CORRESPONDENCE

Notice of the Draft EIS was published in the January 23, 1995 edition of the *OEQC Bulletin*. Copies of the DEIS were distributed to 70 agencies, organizations and libraries. The deadline for comments was March 9, 1995. A total of 32 written comments were received by the publication date of the Final EIS (April 10, 1995). The agencies, organizations and individuals who responded are identified below with an asterisk (*). Comments and applicant responses are reprinted on the following pages.

Federal Agencies

- * Army Engineer District
Department of the Interior, U.S. Fish & Wildlife Service
- * Department of the Interior, U.S. Geological Survey
Department of Commerce, National Marine Fisheries Service
Department of Transportation, U.S. Coast Guard
Environmental Protection Agency
- * Department of Agriculture
- * Commander, Naval Base Pearl Harbor

State Agencies

- * Department of Accounting and General Services
Department of Agriculture
Department of Business, Economic Development and Tourism:
Director
- * Land Use Commission
- * Energy Division
Library
- * Department of Defense
- * Department of Education
- * Housing Finance and Development Corporation
Department of Health:
Director
Environmental Management Division
Office of Environmental Quality Control
- * Department of Hawaiian Home Lands
Department of Human Services
- * Department of Labor and Industrial Relations
- * Department of Land and Natural Resources:
Chairman's Office
- * State Historic Preservation Division
Commission on Water Resource Management
- * Office of State Planning
- * Department of Transportation
Office of Hawaiian Affairs

Oahu Metropolitan Planning Organization

University of Hawaii

Mr. Ralph Horii, Senior Vice President For Administration
Water Resources Research Center

- * Environmental Center

City and County of Honolulu

- * Building Department
- * Board of Water Supply
- Department of Finance
- * Fire Department
- * Department of Housing and Community Development
- * Department of Human Resources
- * Department of Land Utilization
- * Department of Parks and Recreation
- * Planning Department
- * Department of Public Works
- * Police Department
- Oahu Civil Defense Agency
- * Department of Transportation Services
- * Department of Wastewater Management

Public Utilities

Hawaiian Electric Company, Inc.
GTE Hawaiian Telephone Company, Inc.
Oceanic Cable
The Gas Company

Other Agencies, Organizations and Individuals

- * Estate of James Campbell
- State Senator Brian Kanno
- State Representative Annelie Amaral
- City Council Chair John DeSoto
- Ewa Neighborhood Board
- Ewa Village Community Association
- American Lung Association
- * Haseko (Ewa), Inc.
- * Gentry Homes, Ltd.

CORRECTION

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

CHAPTER 14
FINAL EIS CONSULTATION CORRESPONDENCE

Notice of the Draft EIS was published in the January 23, 1995 edition of the *OEQC Bulletin*. Copies of the DEIS were distributed to 70 agencies, organizations and libraries. The deadline for comments was March 9, 1995. A total of 32 written comments were received by the publication date of the Final EIS (April 10, 1995). The agencies, organizations and individuals who responded are identified below with an asterisk (*). Comments and applicant responses are reprinted on the following pages.

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Department of the Interior, U.S. Fish & Wildlife Service
- * Department of the Interior, U.S. Geological Survey
Department of Commerce, National Marine Fisheries Service
Department of Transportation, U.S. Coast Guard
Environmental Protection Agency
- * Department of Agriculture
- * Commander, Naval Base Pearl Harbor

State Agencies

- * Department of Accounting and General Services
Department of Agriculture
Department of Business, Economic Development and Tourism:
Director
- * Land Use Commission
- * Energy Division
Library
- * Department of Defense
- * Department of Education
- * Housing Finance and Development Corporation
Department of Health:
Director
Environmental Management Division
Office of Environmental Quality Control
- * Department of Hawaiian Home Lands
Department of Human Services
- * Department of Labor and Industrial Relations
- * Department of Land and Natural Resources:
Chairman's Office
- * State Historic Preservation Division
Commission on Water Resource Management
- * Office of State Planning
- * Department of Transportation
Office of Hawaiian Affairs

Oahu Metropolitan Planning Organization

University of Hawaii

- Mr. Ralph Horii, Senior Vice President For Administration
- Water Resources Research Center
- * Environmental Center

City and County of Honolulu

- * Building Department
- * Board of Water Supply
- Department of Finance
- * Fire Department
- * Department of Housing and Community Development
- * Department of Human Resources
- * Department of Land Utilization
- * Department of Parks and Recreation
- * Planning Department
- * Department of Public Works
- * Police Department
- Oahu Civil Defense Agency
- * Department of Transportation Services
- * Department of Wastewater Management

Public Utilities

- Hawaiian Electric Company, Inc.
- GTE Hawaiian Telephone Company, Inc.
- Oceanic Cable
- The Gas Company

Other Agencies, Organizations and Individuals

- * Estate of James Campbell
- State Senator Brian Kanno
- State Representative Annelie Amaral
- City Council Chair John DeSoto
- Ewa Neighborhood Board
- Ewa Village Community Association
- American Lung Association
- * Haseko (Ewa), Inc.
- * Gentry Homes, Ltd.

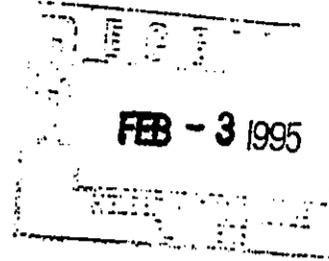


DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

January 27, 1995

Planning Division



Mr. Brian Suzuki
City and County of Honolulu
Planning Department
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Suzuki:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement for the Proposed East Kapolei Project, Oahu (TMK 9-1-17: 04). We do not have any comments to offer beyond those provided in our previous letter dated December 22, 1994.

Sincerely,

R. J. Pelowski

Ray H. Jyo, P.E.
Director of Engineering

Copies Furnished:

Mr. Mike Angotti
Schuler Homes, Inc.
828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813

✓ Ms. Leslie Kurisaki
Helber Hastert & Fee Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Helber Hastert
Planners

April 3, 1995

Mr. Ray H. Jyo, P.E.
Director of Engineering
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440



Dear Mr. Jyo:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated January 27, 1995 responding to our request for comments on the above-referenced DEIS. We note that you have no comments beyond those provided in your previous letter dated December 22, 1994. We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



United States Department of the Interior

U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

January 30, 1995

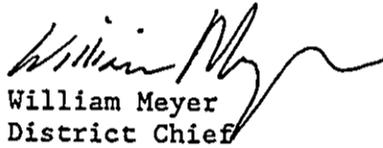
Mr. Brian Suzuki
City and County of Honolulu
Planning Department
650 South King St., 8th Floor
Honolulu, Hawaii 96813

Dear Mr. Suzuki:

The staff of the U.S. Geological Survey, Water Resources Division, has reviewed the subject Draft Environmental Impact Statement (DEIS), and we have no comments to offer at this time.

Thank you for allowing us to review the DEIS. We are returning it to your office for your future use.

Sincerely,


William Meyer
District Chief

cc: Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Mr. Mike Angotti
Director of Land Services
Schuler Homes, Inc.
828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813

Ms. Leslie Kurisaki
Project Planner
Helbert Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Enc.

2/94-0302

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

3049 Ualena Street
Suite 801
Honolulu, HI
96819-1950

February 14, 1995

Mr. Brian Suzuki
City and County of Honolulu
Planning Department
650 South King Street
Honolulu, HI 96813

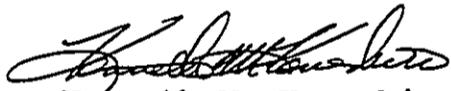
Dear Mr. Suzuki:

Subject: Draft Environmental Impact Statement for
the East Kapolei Project.

We have completed our review of the Draft Environmental Impact Statement for the East Kapolei project. The only major concern we have is the loss of prime agricultural lands on Oahu. As you know, the Natural Resources conservation Service discourages such conversions and suggest that other alternative sites be found.

Thank you for the opportunity to review the DEIS for the East Kapolei Project.

Sincerely,



Kenneth M. Kaneshiro
State Conservationist

cc: Mr. Michael Bajinting, District Conservationist, Honolulu
Field Office

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1995 FEB 21 PM 1:55
C&C HONOLULU

The Natural Resources Conservation Service
formerly the Soil Conservation Service,
is an agency of the
United States Department of Agriculture

AN EQUAL OPPORTUNITY EMPLOYER

Helber Hastert
Planners

April 3, 1995

Mr. Kenneth M. Kaneshiro
State Conservationist
National Resources Conservation Service
U.S. Department of Agriculture
3049 Ualena Street, Suite 801
Honolulu, Hawaii 96819-1950



Dear Mr. Kaneshiro:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated February 14, 1995 responding to our request for comments on the above-referenced DEIS. We acknowledge that your agency discourages the conversion of agricultural land and is concerned over the loss of prime agricultural lands on Oahu. However, we would like to emphasize that Oahu Sugar Company's termination of sugar cane cultivation on the site will occur with or without the project, and is a result of economic and financial conditions, rather than a result of this project.

As noted in the EIS, the first phase of the project is part of a land exchange, whereby the State of Hawaii will receive 2,200 acres of prime agricultural lands in Central Oahu for 500 acres of Kapolei lands. Given the demonstrated importance of the Central Oahu lands for pineapple production and the closure of Oahu Sugar Company, Ltd., the exchange is viewed as a strategically important move to protect Oahu farm land.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone: 808 545-2055
Facsimile: 808 545-2050

MAR 7 1995

11010
Ser N42(2311)/ 6167

MAR 6 1995

Mr. Brian Suzuki
Planning Department, City & County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Suzuki:

DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS), EAST KAPOLEI PROJECT

Thank you for the opportunity to review and comment on the draft EIS for the East Kapolei Project, Oahu.

Navy comments are as follows:

a. Drainage. It is noted that the area marked in orange on enclosure (1) will not be a portion of a planned detention basin adjacent to the wildlife refuge as shown on Figure 16 on page 6-7 of the subject EIS. The planned detention basin, as identified on the proposed Environmental Assessment (EA) for the new detention basin, is marked in green on enclosure (1). Furthermore, the EIS also indicates on Figure 16, but not in the text on page 6-10 that overflow runoff from the existing 29 acre-feet detention basin will flow into the proposed new large detention basin on a new grass-lined channel which will connect the two basins, shown in blue on enclosure (1). This new grass-lined channel is not shown on the proposed EA for the new detention basin and its impacts are not assessed. Accordingly, it is recommended that this EIS assess the erosion and siltation impact of this runoff on the new grass-lined channel and detention basin and provide mitigating measures, as applicable.

Additionally, the Navy has not yet accepted the Gentry proposed 273 acre-feet detention basin which will provide storm water runoff drainage for a substantial portion of the proposed East Kapolei Project. Negotiations for acceptance of the proposed detention basin are currently ongoing and include consideration of required environmental mitigation measures and acceptance of operation and maintenance responsibility by the City and County of Honolulu Department of Housing and Community Development.

b. Concur with the findings of the two biologists. The area has been disturbed by sugar operations and contains no species of special biological interest.

c. Appendix C, State Historic Preservation Office's findings of "no effect", should include the Section 106 consultation letter.

d. Appendix I, Air Quality Impact Report, Page 4, Section 2, Paragraph 3: In the Hawaii Administrative Rules Title 11 Chapter 59 Ambient Air Quality Standards, only short term, 1 hr, 3 hr, 8 hr and 24 hr standards may be

11010
Ser N42(2311)/ 6167
MAR 6 1995

exceeded once in a 12 month period. The annual and quarterly standard shall not be exceeded. The original state air quality standard was $150\mu\text{g}/\text{m}^3$ for Total Suspended Particulate Matter (TSP), however, under the revised standards, the $150\mu\text{g}/\text{m}^3$ standard is for PM-10.

The Navy's point of contact is Mr. Stanford Yuen at 474-0439.

Sincerely,

/s/

STANFORD B. C. YUEN
Facilities Engineer
By direction of
the Commander

Copy to:
Mr. Mike Angotti
Director of Land Services
Schuler Homes, Inc.
828 Fort Street Mall, Fourth Floor
Honolulu, HI 96813

Ms. Leslie Kurisaki
Project Planner
Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Blind copy to:
PACNAVFACENCOM (Code 23)



Source: Gray, Hong, Bills & Associates, Inc.
October 1994

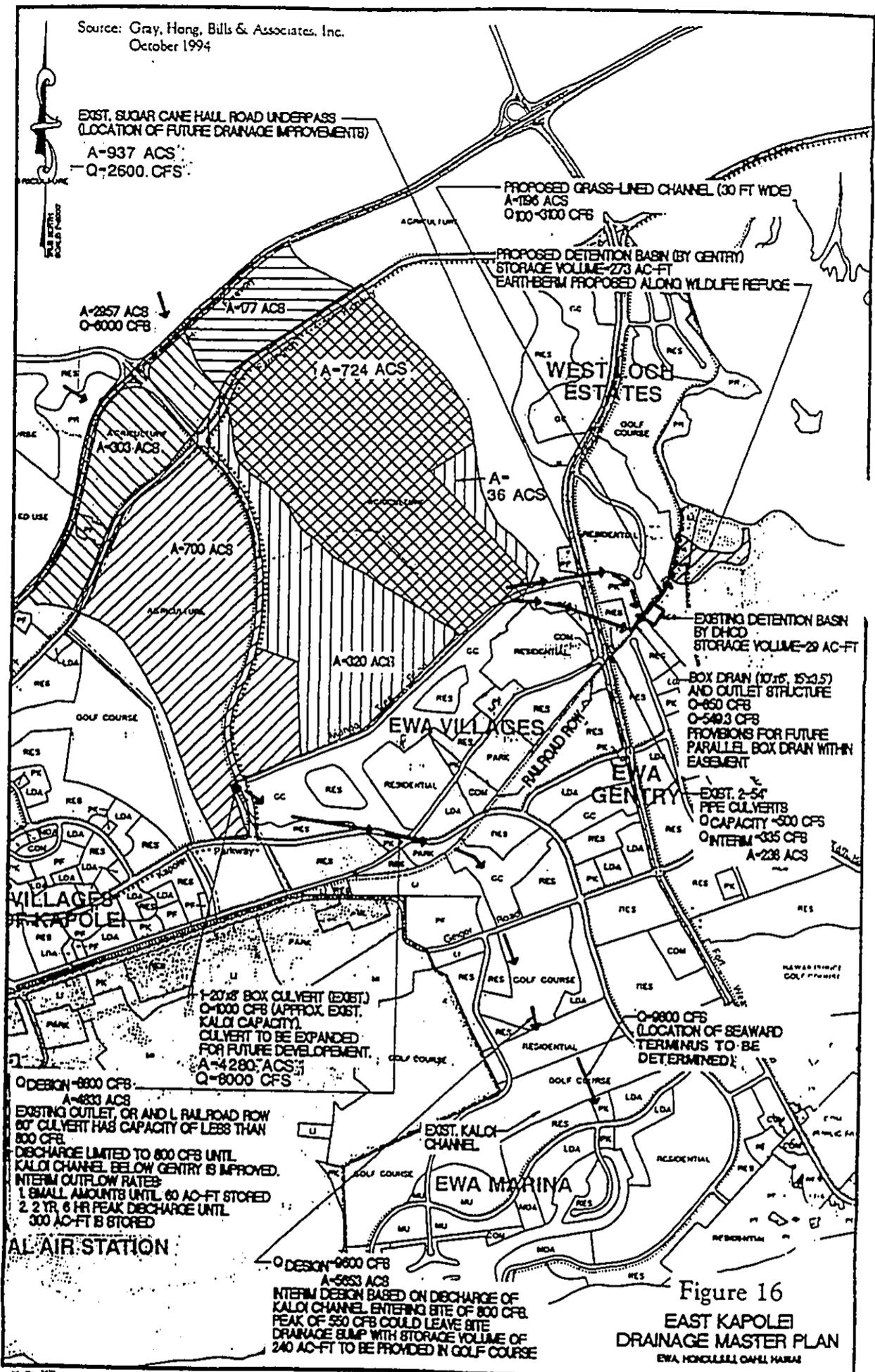


Figure 16
EAST KAPOLEI
DRAINAGE MASTER PLAN
EWA, HONOLULU, OAHU, HAWAII

GRAY, HONG, BILLS AND ASSOCIATES, INC.

ENCLOSURE(1)

Helber Hastert
Planners

March 31, 1995

Mr. Sanford B. C. Yuen
Facilities Engineer
Commander Naval Base Pearl Harbor
P.O. Box 110
Pearl Harbor, Hawaii 96860-5020



Dear Mr. Yuen:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 6, 1995 (11010 Ser N42(2311)/6167) responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

Drainage

Figure 16 of the EIS has been revised and the EIS text has been revised to more completely describe the West Loch drainage proposal. The grass-lined swale will be designed in accordance with City and County standards with a maximum velocity of five feet per second to prevent erosion. Improvements will be designed to conform to City and County requirements concerning siltation and erosion.

State Historic Preservation Office

The State Historic Preservation Office's letter concurring that the project will have "no effect" on historic sites is included as Appendix C of the DEIS. As the project does not involve federal lands or funds, a Section 106 consultation is not required.

Air Quality Impact Report

Your comment is correct. It is implicit that an annual standard cannot be exceeded once per year as can short-term standards.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Helber Hastert

Planners

Mr. Sanford B.C. Yuen

March 31, 1995

Page 2

Your second comment is also an accurate statement. However, the air quality report was simply noting that by adopting a PM_{10} standard that was numerically equal to the former TSP standard, the State in effect relaxed the air quality standard, because PM_{10} comprises 50 percent of TSP based on actual measurement data in Honolulu.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners



Leslie Kurisaki

Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Planning Department
City and County of Honolulu
650 South King Street, 8th Floor
Honolulu, Hawaii 96813

Attention: Mr. Brian Suzuki

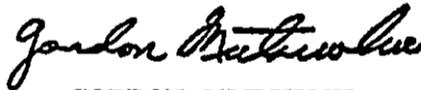
Gentlemen:

Subject: East Kapolei Project
Ewa, Oahu, Hawaii
Draft EIS

Thank you for the opportunity to review the subject document. We have no comments to offer.

If there are any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Very truly yours,



GORDON MATSUOKA
State Public Works Engineer

RY:jk

cc: OEQC

Schuler Homes, Inc.
✓ Helber Hastert and Fee, Planners

Helber Hastert
Planners

April 3, 1995

Mr. Gordon Matsuoka
State Public Works Engineer
State of Hawaii
Department of Accounting and General Services
Public Works Division
P.O. Box 119
Honolulu, Hawaii 96810



Dear Mr. Matsuoka:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated February 2, 1995 responding to our request for comments on the above-referenced DEIS. We note that you have comments at this time. We appreciate your review of the DEIS. *Your letter will be reproduced in the Final EIS.*

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

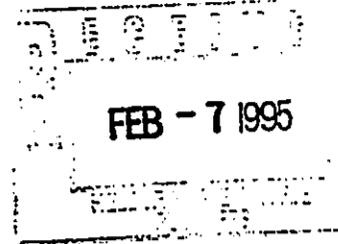
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822



February 6, 1995

Mr. Brian Suzuki
Planning Department
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Suzuki:

Subject: Draft Environmental Impact Statement (DEIS) for
the East Kapolei Project, TMK No.: 9-1-17: por. 4

We have reviewed the DEIS for the subject project, and have the following comments to offer:

- 1) On pages 1-3, 2-1 and 3-6 and Figure 6 of the DEIS, reference is made to an "Agriculture" District. Please be advised that the proper State land use designation is "Agricultural" District.
- 2) There appears to be a discrepancy in the representation of the southern boundary of Phase I of the subject project in Figures 1 and 2 of the DEIS. Specifically, the southern border as shown in Figure 2 appears to be located adjacent to Mango Tree Road, whereas in Figure 1 there is a gap between the road and the boundary. Other figures in the DEIS appear to be consistent with the representation in Figure 1.
- 3) A more thorough discussion of the project's conformance with each of the applicable policies and objectives of the Coastal Zone Management program, Chapter 205A-2, Hawaii Revised Statutes, should be provided.
- 4) A more thorough and detailed discussion of the alternatives to the proposed action should be provided in Chapter 7, pursuant to Section 11-200-17(f), Hawaii Administrative Rules.
- 5) Chapters 4, 5, and 6, which summarize the subject project's probable impacts on the environment, should include a thorough discussion on the interrelationships and cumulative environmental impacts of the subject

Mr. Brian Suzuki
February 6, 1995
Page 2

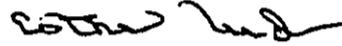
project and other related developments in the region upon the environment.

- 6) As stated in the DEIS, the Office of State Planning's (OSP) boundary amendment petition filed under LUC Docket No. A94-708 includes the area comprising Phase I of the subject project. For your information, the Land Use Commission is scheduled to act on OSP's petition at its meeting on February 23, 1995, in Lahaina, Maui.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the DEIS.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,



ESTHER UEDA
Executive Officer

cc: OEQC
Mike Angotti
Leslie Kurisaki

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Helber Hastert
Planners

April 3, 1995

Ms. Esther Ueda, Executive Officer
State of Hawaii
Department of Business Economic Development & Tourism
Land Use Commission
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813



Dear Ms. Ueda:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

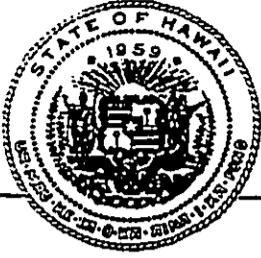
Thank you for your letter to the City and County of Honolulu Planning Department dated February 6, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

- 1) References to "Agriculture" district have been revised to "Agricultural" district.
- 2) In Figure 2, the southern boundary of the Phase I area has been revised to be consistent with other figures.
- 3) A more thorough discussion of the project's conformance to each of the applicable policies and objectives of the Coastal Zone Management Program, Chapter 205A-2, HRS has been provided in the EIS.
- 4) A more thorough and detailed discussion of the alternatives to the proposed action has been provided in Chapter 7, as requested.
- 5) Chapters 4, 5 and 6 have been revised to include a discussion of the interrelationships and cumulative environmental impacts of the project and other related developments in the region. Particular focus was given to regional cumulative traffic and drainage impacts.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



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

BENJAMIN J. CAYETANO
Governor
SEIJI F. NAYA
Director
RICK EGGED
Deputy Director

ENERGY DIVISION, 335 MERCHANT ST., RM. 110, HONOLULU, HAWAII 96813 PHONE: (808) 587-3800 FAX: (808) 587-3820

February 7, 1995

Mr. Brian Suzuki
Planning Department
City & County of Honolulu
650 South King St.
Honolulu, Hawaii 96813

Dear Mr. Suzuki:

Subject: East Kapolei Project Draft Environmental
Impact Statement (DEIS)

Thank you for the opportunity to comment on the proposed East Kapolei residential development of multi-family apartments, townhomes, and single family homes. We have previously provided comments to Helber Hastert & Fee in regard to the Environmental Impact Statement Preparation Notice (EISPN). We are enclosing a copy of this letter for your information.

As you are aware, Draft Environmental Impact Statements should comply with the requirements found in State laws for evaluating any energy impacts that the project will have. The mandate for such an evaluation is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226, HRS ("Hawaii State Planning Act"). In particular, Chapter 226-18 (a) (2) and (c)(3); 226-52(a)(2) and (b)(2)(D); and 226-103(f)(1) and (2) should be noted.

We would like to call your attention to a statement made by the developer on page 3-1:

"The goals, objectives policies and guidelines of the Hawaii State Plan are, on occasion, in competition with one another. As a result, the proposed project supports some of the goals, while it is inconsistent with others. The following analyzes the project's impacts with respect to relevant State Plan goals, objectives, policies and priority guidelines:"

Helber Hastert

Planners

March 27, 1995



Mr. Maurice H. Kaya
Energy Program Administrator
State of Hawaii
Department of Business, Economic Development and Tourism
Energy Division
335 Merchant Street, Rm. 110
Honolulu, Hawaii 96813

Dear Mr. Kaya:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated February 7, 1995 responding to our request for comments on the above-referenced DEIS. As requested, the project's relationship to State Plan goals and objectives relating to energy has been included in Section 3.2 of the EIS. The project will comply with all City and County building codes and ordinances applicable to residential structures. The developer will consider the installation of roof insulation as an option for East Kapolei home buyers. A copy of the Model Energy Code has been forwarded to the developer for use during project planning and design.

In addition to building-related energy efficiency, we would like to emphasize that as a part of the second city in Kapolei, the project will have a positive long-term effect on Oahu's transportation-related energy consumption. The transportation sector has been identified as the single largest consumer of energy in the State (State Functional Plan, Energy, 1991). The development of the "second city" is largely intended to reduce the need for automobile commuting between downtown Honolulu and suburban Oahu. As part of the second city, the East Kapolei project will promote a new community where residents can live and work, contributing to a reduction in automobile-related fossil fuel consumption.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
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Telephone 808 545-2055
Facsimile 808 545-2050

Helber Hastert
Planners

Mr. Maurice H. Kaya
March 27, 1995
Page 2

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

BENJAMIN J. CAYETANO
GOVERNOR

MAJOR GENERAL EDWARD V. RICHARDSON
DIRECTOR OF CIVIL DEFENSE

ROY C. PRICE
VICE DIRECTOR OF CIVIL DEFENSE



PHONE (808) 734-2161
FAX (808) 737-4150

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

March 6, 1995

MAR - 8 1995

TO: Mr. Brian Suzuki
Planning Department
City & County of Honolulu

FROM: Roy C. Price, Sr.
Vice Director of Civil Defense

SUBJECT: SCHULER HOMES, INC., DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS),
IN SUPPORT OF A DEVELOPMENT PLAN (DP) LAND USE MAP APPLICATION AT
EAST KAPOLEI, EWA, OAHU

State Civil Defense (SCD) appreciates this opportunity to comment on Schuler Homes, Inc., DEIS in support of a DP for the East Kapolei Project, Phase 1 and 2, Tax Map Key (TMK) 9-1-17:04 (por), Ewa, Oahu, Hawaii.

We do not have any negative comments specifically directed at this DEIS in support of a DP for the East Kapolei Project. However, SCD proposes that the developer purchase and install two solar powered sirens and siren support infrastructure to alert residents of an impending or actual event that threatens the project area. These sirens must be compatible with the existing statewide civil defense siren system. In "Phase 1," a 115 dB siren should be installed at the park along the main access roadway and be at least 500 feet from the property line of the elementary school. The 115 dB siren requires a 100-foot radius buffer zone in which there are no residential structures. In "Phase 2," a 121 dB siren should be installed on the commercial property adjacent to the main project spine road approximately 500 feet from the end of the road. The 121 dB siren requires a 250-foot radius buffer zone in which there are no residential structures. All siren locations are annotated in red on the enclosed copy of "Figure 5" of the Schuler Homes, Inc., East Kapolei Project Preliminary Concept Plan.

Mr. Brian Suzuki
March 6, 1995
Page 2

Just as parks, schools, fire hydrants, underground/overhead utilities, sidewalks and streets are planned as integral parts of planned developments, so must an emergency warning system be planned by the developer for the safety and well-being of the residents of this project.

Section 2, "PROJECT DESCRIPTION," paragraph 2.5, "Project Proposal," Table 1, and subparagraph 2.5.1, "Residential," describes a proposal to build 10,000 units in two phases over fifteen years. Paragraphs 2.5.3 and 2.5.4 discuss "Parks" and "Schools," respectively. Section 4, "ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE IMPACTS: PHYSICAL ENVIRONMENT," paragraph 4.2 "Geology and Topography," addresses the slope (1.4 per cent mauka-makai) and elevation of the project area--55 feet above mean sea level (msl) to 175 feet above msl. Each phase should be evaluated for the impact of the terrain features on tropical storm/hurricane force winds (one third of the project area is located within the Kalo'i Gulch drainage basin) and the resulting amplification of such winds. With the addition of approximately 5,000 units in each of two phases and the associated population growth, serious consideration must be given to shelter area residents without exacerbating the already critical number of designated shelter spaces for the Waianae and Ewa districts. Structures within each phase should be designed and constructed to withstand the potentially destructive winds at the project site. Public structures, such as recreation facilities and schools, so designed and constructed, could then be surveyed for use as public shelters.

Paragraph 4.4, "Flooding," Existing Conditions, identifies the project area as designated Zone D (flood hazard undetermined) in accordance with the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). It also acknowledges sheetflow flooding when Kalo'i Gulch's capacity to handle peak discharges is exceeded. Torrential rains also accompany tropical storms and hurricanes. Structures and drainage systems within each phase should be designed and constructed to withstand the potentially destructive sheetflow type of flooding previously addressed.

Section 6, "ASSESSMENT OF EXISTING CONDITIONS AND PROBABLE IMPACTS: PUBLIC FACILITIES AND SERVICES," paragraph 6.1, "Transportation," Existing Conditions, Probable Impacts and Mitigation addresses the probable impact of traffic generated by the planned development. It appears that Fort Weaver Road will be the primary access road while Phase 1 is being completed. With the influx of members of 5,000 households, the adequacy of existing roadways to handle ingress and egress of emergency vehicles, as well as evacuation of the project area when determined necessary, must seriously be evaluated.

Mr. Brian Suzuki
March 6, 1995
Page 3

Our SCD planners and technicians are available to discuss this further if there is a requirement. Please have your staff call Mr. Mel Nishihara of my staff at 734-2161.

Enc.

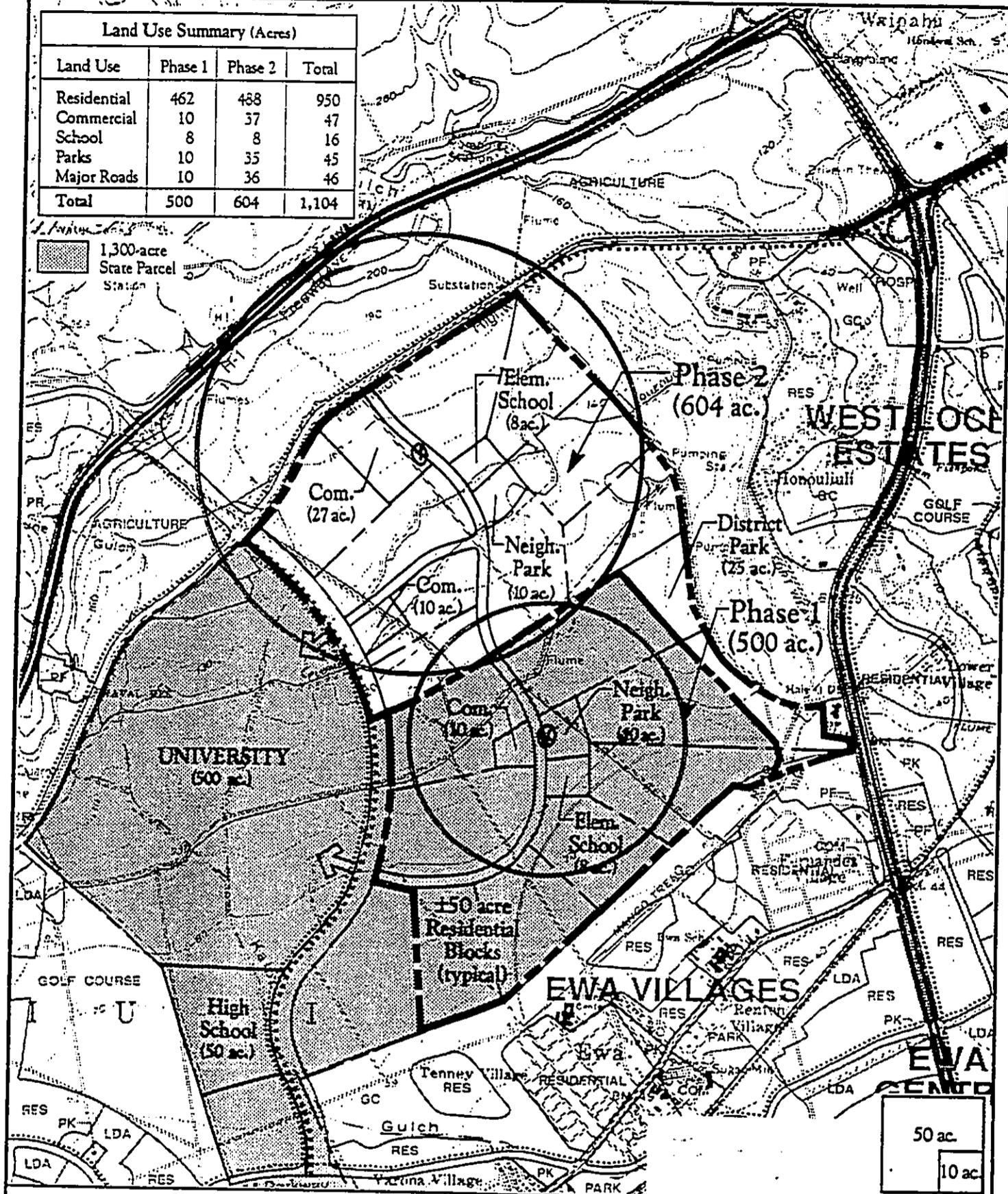
c: Mr. Mike Angotti
Schuler Homes, Inc.

✓ Ms. Leslie Kurisaki
Helber Hastert & Fee, Planners

Office of Environmental
Quality Control

Land Use Summary (Acres)			
Land Use	Phase 1	Phase 2	Total
Residential	462	488	950
Commercial	10	37	47
School	8	8	16
Parks	10	35	45
Major Roads	10	36	46
Total	500	604	1,104

1,300-acre State Parcel Station



Preliminary Concept Plan
EAST KAPOLEI PROJECT
 Schuler Homes, Inc.

FEET
 0 1000 2000
 Helber Hastert & Fee, Planners

50 ac.
 10 ac.
 Figure
5

Helber Hastert
Planners

April 4, 1995

Mr. Roy C. Price, Sr., Vice Director
State of Hawaii Department of Defense
Office of the Director of Civil Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495



Dear Mr. Price:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 6, 1995 responding to our request for comments on the above-referenced DEIS.

Schuler Homes and the Estate of James Campbell will provide the required two sirens and siren support infrastructure, provided that the final location of the sirens is acceptable to all parties. The proposed siren location in Phase 1 is within the park site which will be dedicated to the City and County Department of Parks and Recreation. The proposed siren location in the Phase 2 area is within the 27-acre commercial area which will be retained and developed by the Estate of James Campbell.

Public structures such as recreation facilities and elementary schools will be available to be surveyed for use as public shelters. Structures and drainage systems will be designed to meet applicable flood zone criteria.

Finally, we would like to clarify that Farrington Highway, not Fort Weaver Road, will provide primary access to the site during Phase 1 build-out.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Benjamin J. Cayetano
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

HERMAN M. AIZAWA, PH.D.
SUPERINTENDENT

OFFICE OF THE SUPERINTENDENT

February 28, 1995

MAR 14 1995

Mr. Brian Suzuki
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Suzuki:

SUBJECT: Draft Environmental Impact Statement
East Kapolei Project
Ewa, Oahu, Hawaii

After reviewing the Draft Environmental Impact Statement (DEIS), we have the following comments to add to our December 29, 1994 letter for the Environmental Impact Statement Preparation Notice (EISPN), the subsequent response by the project planner of Helbert, Hastert, and Fee, and a letter from Schuler Homes, Inc.:

- 1) The Department of Education's (DOE) enrollment projections due to the proposed 10,000 housing units are still valid and are the basis for our comments.
- 2) The DEIS preliminary concept plan on figure 5 and table 1 on page 2-11 still indicates that there are only two elementary school sites of eight acres next to parks dedicated to the City and County of Honolulu. In our discussions with representatives from Schuler Homes, we have indicated that our minimum land requirements are two elementary schools and an intermediate school since the existing and proposed Kapolei Intermediate Schools will be unable to accommodate the students generated by this development. We request the site location of the intermediate school be determined in cooperation with the DOE in conformance with the Educational Specifications and Standards for Facilities as indicated in the project planner's response letter of January 6, 1995. If a site is contemplated off the site, the DOE needs to be involved in the discussions of the proposed location.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

- 3) We acknowledge the concerns of Schuler Homes, Inc. (SH) related to the high school fair-share contribution. However, an impact of 770 students cannot be overlooked. The request for a fair-share contribution will be pursued and we agree that a formula for the fair share must be developed and are in the process of asking a national consultant to recommend a formula. Although the January 6, 1995 letter from SH requests that a fair-share determination be equitable, it does not recognize that we have made proposals to the Land Use Research Foundation (LURF). SH is a member of LURF, and the LURF and DOE were unable to agree on a position regarding the fair-share contribution. It is our understanding that within LURF, all members could not agree on acceptance of the DOE proposal. Our initial formulas were often questioned by developers regarding everything from enrollment projections, to cost of constructing classrooms, and to land costs making any negotiations on a equitable statewide basis difficult because each developer wished to negotiate rather than accept the same formula.
- 4) In the SH letter, they refer to the costs of the new Kapolei Elementary School costing \$7,094,385. It is important to note that this is the cost only for the first increment. Subsequent increments two to four are expected to increase the cost by an estimated \$12,042,000 for a total school cost of approximately \$19,136,000. The additional square footage is not determined at this point and the \$444 per foot is definitely a miscalculation by SH.
- 5) It is regrettable that SH chooses to make comparisons with adjoining developers since no two projects are identical. We have still not completed our fair-share contribution agreement with Gentry Homes regarding their development. Gentry Homes received many of their approvals prior to the beginning of our requests for fair-share contributions. The DOE wishes to make the rules of the road easier for developers and erase the need for individual negotiations on each project.

The DOE believes that it is in the interest of developers to make every effort to assist in developing adequate and attractive schools which will increase the value of the houses being marketed and make sales more attractive. It is our belief that good schools which are not overcrowded attract more homebuyers.

February 28, 1995
Page 3

If there are any questions regarding our response, please direct them to the Facilities Branch at 733-4862.

Sincerely,


Herman M. Aizawa, Ph.D.
Superintendent

HMA:jl(AH)

cc: A. Suga
A. Maeda, Leeward
M. Angotti, Schuler Homes
✓ L. Kurisaki, HH&F

RECEIVED
FEB 29 1995
FACILITIES BRANCH
733-4862

IN WAINZE
SUPERVISOR

DEPT OF EDUCATION
SUPT'S OFFICE



OFFICE OF BUS. SVCS.
ASST. SUPT'S OFFICE

BRIAN J. J. CHOY
Director

JAN 24 1 39 PM '95

STATE OF HAWAII

JAN 26 1 59 PM '95

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 526-4185

DBS
Seward
App. Action
Due: 1/10
1/26

Dear Participant:

Attached for your review is a Draft Environmental Impact Statement (DEIS) which was prepared pursuant to the EIS law (Hawaii Revised Statutes, Chapter 343) and the EIS rules (Administrative Rules, Title 11, Chapter 200).

TITLE OF PROJECT: East Kapolei Project

LOCATION: ISLAND Oahu DISTRICT Ewa

TAX MAP KEY NUMBERS: 9-1-17:04 (por)

AGENCY ACTION: _____ APPLICANT ACTION: X

YOUR COMMENTS MUST BE RECEIVED OR POSTMARKED BY (minimum 45 day comment period): March 9, 1995

PLEASE SEND ORIGINAL COMMENTS TO THE:

ACCEPTING AUTHORITY: Planning Department, City & County of Honolulu
ADDRESS: 650 South King Street
Honolulu, Hawaii 96813

CONTACT: Mr. Brian Suzuki PHONE: 527-6073

COPIES OF THE COMMENTS SHOULD BE SENT TO OEQC AND THE FOLLOWING:

PROPOSING AGENCY OR APPLICANT: Schuler Homes, Inc.
ADDRESS: 828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813

CONTACT: Mr. Mike Angotti, Director of Land Services PHONE: 527-6073

CONSULTANT: Helber Hastert & Fee, Planners
ADDRESS: 733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

CONTACT: Ms. Leslie Kurisaki, Project Planner PHONE: 545-2055

Helber Hastert
Planners

April 3, 1995

Dr. Herman M. Aizawa
Superintendent
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804



Dear Dr. Aizawa:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County Planning Department dated February 28, 1995 responding to our request for comments on the above-referenced DEIS.

Schuler Homes strongly agrees with your comment that the availability of high quality schools makes for a more desirable community, and that it is in the interest of developers to ensure that adequate and attractive schools are available to residents.

Elementary Schools

The East Kapolei development includes two 8-acre elementary school sites. Although Schuler Homes is committed to providing the school sites, it would also like the DOE's commitment that the schools will be constructed and operational in a timely manner to serve East Kapolei residents. Specifically, the Phase 1 elementary school should be operational by 1998. Based on current projections, the Phase 2 elementary school should be operational by about 2006.

Intermediate School

Although Schuler Homes concurs that a new intermediate school is needed in the area, it believes that the demand for the school is being generated by a number of developments in the area, and therefore, is more of a regional need than a direct result of this project. As stated in our January 6, 1995 letter to you, Schuler Homes is very willing to work with other adjacent landowners for the provision of an intermediate school site.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Helber Hastert

Planners

Dr. Herman Aizawa

April 3, 1995

Page 2

High School

As stated in its position paper dated January 6, 1995, Schuler Homes strongly believes that a State-wide standard needs to be established regarding "fair share" contribution for high school impact. Schuler Homes supports your efforts to develop fair share standards with the assistance of a national consultant, and looks forward to reviewing their recommendations. Like the DOE, Schuler Homes wishes to eliminate the need for individual, ad hoc negotiations on each project, and will willingly participate in Statewide impact fees which have been fairly established and are evenly applied.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

BENJAMIN J. CAYETANO
GOVERNOR



ROY S. OSHIRO
ACTING EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO:
95:PPE/2000

March 6, 1995

MAR 13 1995

The Honorable Cheryl D. Soon
Chief Planning Officer
City and County of Honolulu
Planning Department
650 South King Street
Honolulu, Hawaii 96813

Attn: Mr. Brian Suzuki

Dear Ms. Soon:

Subject: Draft Environmental Impact Statement (DEIS) for East
Kapolei Project, TMK# 9-1-17:por. 4, Ewa, Oahu

We have reviewed the subject DEIS and have the following
comments to offer:

1. According to the DEIS, the proposed project will consist of 7,500 multi-family apartments and townhomes and 2,500 single family units. Please provide a table of the affordable breakdown for each type of housing and the targeted income groups.
2. Referencing page 5-3, the Villages of Kapolei will consist of approximately 5,000 units at buildout. As of December 1994, there were approximately 1,400 units completed.
3. The State has not discussed any affordable housing conditions with the developer or his representatives. We look forward to working with the applicant in order to formulate an affordable housing program for the proposed project.
4. Further information is needed on the impact of 10,000 units to the school system. The delivery of the school sites and phasing of the facility development should be addressed in relationship to the scheduled delivery of homes.



The Honorable Cheryl D. Soon
Page 2
March 6, 1995

5. Although the DEIS states that the North-South Road and drainage are unresolved issues, how these issues are addressed will impact the environment and surrounding communities. If the North-South Road is not provided, the Fort Weaver Road traffic will be impacted. If an extension of the Kapolei Parkway is constructed, what will be the impact on the Villages of Kapolei? What mitigation measures will be taken?

If the improved channel within the proposed North-South Road corridor is not constructed, what measures will be taken to handle the offsite runoff and ensure water quality? Would a retention/detention system be required?

Thank you for the opportunity to comment on the DEIS.

Sincerely,



ROY S. OSHIRO
Acting Executive Director

c: Mr. Michael Angotti, Schuler Homes, Inc.
and Hawaiian Trust Co., Ltd.
Ms. Leslie Kurisaki, Helber Hastert & Fee, Planners
OEQC

Helber Hastert
Planners

March 31, 1995

Mr. Roy S. Oshiro, Acting Executive Director
State of Hawaii
Housing Finance and Development Corporation
677 Queen Street, Suite 300
Honolulu, Hawaii 96813



Dear Mr. Oshiro:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 6, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

1. Table V-16 (page V-36) of the Market Assessment by Gail W. Atwater (Appendix D) provides a breakdown of the affordable units by type of housing and targeted income group.
2. Text revised accordingly.
3. Schuler Homes will work with HFDC to formulate and refine its affordable housing program for the project.
4. The East Kapolei development includes an 8-acre elementary school site in each of the two project phases. The developer has indicated to the Department of Education that it seeks assurances that the schools will be completed and operational when the first residential units of each project phase are occupied.
5. North South Road. Your letter questions what mitigation measures will be taken if the North-South Road is not constructed. First, we would first like to clarify that Farrington Highway, not Fort Weaver Road, will provide primary access to the site during Phase 1 build-out. We reiterate that the North-South Road remains an unresolved issue, and that traffic impacts depend on the current efforts of the State and City and major developers in finalizing the cost sharing agreement to develop regional roadways in the Ewa area.

At present, all indications are that the North-South Road will be constructed. The City Department of Housing and Community Development is designing and constructing portions of the North-South Road through the Ewa Villages area.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Helber Hastert
Planners

Mr. Roy S. Oshiro
March 31, 1995
Page 2

Other portions are in design or have rights-of-way already set aside. HEC0 is completing installation of its new 138 kV transmission line along the corridor. Also, proposed access to the Department of Hawaiian Home Lands project and the planned University are via the North-South Road. Lastly, it is generally held that Fort Weaver Road and specific ramps of Kunia Interchange are operating at or above capacity during peak hours. Therefore, we believe it is not a question of whether the North-South Road will be built, but when it will be completed.

Kapolei Parkway. The impact to the Kapolei Parkway is a valid concern, and the impact depends largely on a region-wide analysis for current land use scenarios. Major users of the Parkway when completed would include Gentry, Ewa Marina, Villages of Kapolei, Barbers Point Naval Air Station, East Kapolei and the City of Kapolei. The East Kapolei Traffic Impact Assessment (Pacific Planning & Engineering) assumes a roadway system that includes a connection to the Kapolei Parkway. However, since the connection to this roadway is not even in a planning stage, no analysis of impacts was conducted.

Regional Highway Master Plan. A major update to the regional highway plan is being conducted by the State Department of Transportation. Total traffic to and from all major developments in the region should be analyzed to determine what "mitigation" measures need to be taken and by whom in the form of a final Parkway layout and construction schedule. The developer will participate in the effort to develop an acceptable cost-sharing method for regional highway improvements.

Offsite Runoff. No development will occur in the Kaloi Gulch drainage basin until adequate drainage facilities are in place.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

March 9, 1995

MAR 13 1995

Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attn: Brian Suzuki

SUBJECT: EAST KAPOLEI PROJECT: Schuler Homes Draft EIS

The Department of Hawaiian Home Lands (DHHL) is scheduled to receive approximately 200 acres of the State's remaining lands at Kapolei in the vicinity of the proposed project.

We anticipate that the infrastructural improvements developed as part of the proposed East Kapolei Project may assist us in moving toward faster construction of homes in the area for our native Hawaiian beneficiaries.

We support the requested Ewa Development Plan Land Use Classification amendments.

If you have any questions, please call Joe Chu of our Planning Office at 586-3837.

Warmest aloha,

A handwritten signature in cursive script that reads "Kali Watson".

Kali Watson, Chairman
Hawaiian Homes Commission

3674L3

cc Schuler Homes, Inc.
✓ Helber Hastert & Fee, Planners
OEQC

Helber Hastert
Planners

April 3, 1995

Mr. Kali Watson, Chairman
Hawaiian Homes Commission
State of Hawaii
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805



Dear Mr. Watson:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 9, 1995 responding to our request for comments on the above-referenced DEIS. We note your comment that DHHL is scheduled to receive approximately 200 acres in the vicinity of the East Kapolei project, and that the Department is in support of the requested Ewa Development Plan land use amendment. We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

BENJAMIN J. CAYTANO
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
830 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

LORRAINE H. AKIBA
DIRECTOR
DAYTON M. NAKANELUA
DEPUTY DIRECTOR

February 23, 1995

MAR - 2 1995

Mr. Brian Suzuki
City and County of Honolulu
Planning Department
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Suzuki:

The Department of Labor and Industrial Relations has received the Draft Environmental Impact Statement for the East Kapolei Project.

According to the document provided, workers will be needed during the construction period. The department would like to offer its assistance in recruiting job applicants to fill these demands through its various employment and training agencies.

Thank you for the opportunity to review the draft EIS. If there are any questions, please call Naomi Harada, Acting Chief of our Research and Statistics Office, at 586-9030.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Lorraine H. Akiba".

Lorraine H. Akiba
Director

c: Schuler Homes, Inc.
✓ Helber Hastert & Fee, Planners

Helber Hastert

Planners

April 3, 1995

Ms. Lorraine H. Akiba, Director
State of Hawaii
Department of Labor and Industrial Relations
830 Punchbowl Street
Honolulu, Hawaii 96813



Dear Ms. Akiba:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated February 23, 1995 responding to our request for comments on the above-referenced DEIS. We appreciate your offer of assistance in recruiting job applicants to fill the demand for construction period employees. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBERT HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

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BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



COPY

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT

CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION

LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

LOG NO: 13754
DOC NO: 9501EJ17

February 3, 1995

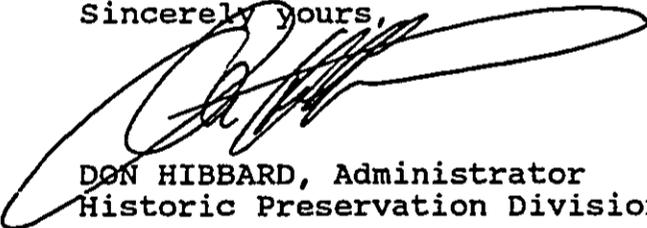
Mr. Brian Suzuki
Planning Department, City
and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Suzuki:

SUBJECT: Draft Environmental Impact Statement (DEIS):
East Kapolei Project, Oahu
Honouliuli, 'Ewa, O'ahu
TMK: 9-1-17: por. 04

The DEIS correctly incorporates our comments that this project will have "no effect" on historic sites. These lands were commercially cultivated with sugar cane for many years and it is unlikely that significant historic sites will be found on them.

Sincerely yours,


DON HIBBARD, Administrator
Historic Preservation Division

EJ:amk

c: OEQC
Shuler Homes, Inc.
Helber Hastert & Fee

Helber Hastert
Planners

April 3, 1995

Mr. Michael D. Wilson, Chairperson
Board of Land and Natural Resources
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809



Dear Mr. Wilson:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 6, 1995 responding to our request for comments on the above-referenced DEIS. We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

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BENJAMIN J. CAYETANO
Governor of Hawaii



Chairperson
MICHAEL D. WILSON
Board of Land and Natural Resources

Deputy Director
GILBERT COLOMA-AGARAN

STATE OF HAWAII

REF:OCEA:SOR

DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. Box 621
Honolulu, Hawaii 96809

FILE NO.: 95-350
DOC. NO.: 43

Aquaculture Development
Aquatic Resources
Boating and Ocean Recreation
Bureau of Conveyances
Conservation and Environmental Affairs
Conservation and Resources Enforcement
Forestry and Wildlife
Historic Preservation
Land Management
State Parks
Water and Land Development

The Honorable Cheryl D. Soon
Chief Planning Officer
Department of Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

MAR - 6 1995

MAR - 7 1995

Dear Ms. Soon:

SUBJECT: Draft Environmental Impact Statement (EIS): East Kapolei
Project, Ewa, Oahu; TMK: 9-1-17: por. 4

We have reviewed the DEIS for the proposed project received on January 25, 1995, and offer the following:

Historic Preservation Division

The Historic Preservation Division (HPD) notes that they have previously commented on this project. Their earlier comments were as follows:

"The DEIS correctly incorporates our comments that this project will have "no effect" on historic sites. These lands were commercially cultivated with sugar cane for many years and it is unlikely that significant historic sites will be found on them."

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

Please feel free to call me Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Aloha,

MICHAEL D. WILSON

xc: Mike Angotti, Schuler Homes, Inc.
Leslie Kurasaki, Helmert Eastert & Fee, Planners

Helber Hastert
Planners

April 3, 1995

Mr. Don Hibbard, Administrator
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
33 S King Street, 6th Floor
Honolulu, Hawaii 96813



Dear Mr. Hibbard:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated February 3, 1995 responding to our request for comments on the above-referenced DEIS. We note your comment that the project will have "no effect" on historic sites. We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

A handwritten signature in cursive script that reads "Leslie Kurisaki".

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



OFFICE OF STATE PLANNING

Office of the Governor

MAILING ADDRESS: P.O. BOX 3540, HONOLULU, HAWAII 96811-3540
STREET ADDRESS: 250 SOUTH HOTEL STREET, 4TH FLOOR
TELEPHONE: (808)587-2848, 587-2800

Benjamin J. Cayetano, Governor

FAX: Director's Office 587-2848
Planning Division 587-2824

Ref. No. C-1026

February 2, 1995

FEB - 9 1995

Mr. Brian Suzuki
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Suzuki:

Subject: Environmental Impact Statement for the East
Kapolei Project

We have reviewed the Environmental Impact Statement for the East
Kapolei Project and do not have any comments at this time.

We appreciate the opportunity to review the Environmental Impact
Statement.

Sincerely,

Gregory G. Y. Pai, Ph.D.
Director

cc: Mr. Mike Angotti, Schuler Homes Inc.
Ms. Leslie Kurisaki, Helber Hastert and Fee

Helber Hastert
Planners

April 3, 1995

Mr. Gregory G. Y. Pai, Ph.D.
Director
Office of State Planning
Office of the Governor
P.O. Box 3540
Honolulu, Hawaii 96811-3540



Dear Dr. Pai:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter dated February 2, 1995 responding to our request for comments on the above-referenced DEIS. We note that you have comments at this time. We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

BENJAMIN CAYETANO
GOVERNOR



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

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
SAM CALLEJO
GLENN M. OKIMOTO

IN REPLY REFER TO:
STP 8.6656

March 22, 1995

Ms. Cheryl D. Soon
Chief Planning Officer
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

MAR 27 1995

Dear Ms. Soon:

Subject: East Kapolei Project
Draft Environmental Impact Statement (DEIS)
To Amend the Ewa Development Plan Land Use Map

Thank you for your transmittal requesting our review of the subject DEIS. We have the following comments:

1. Schuler Homes, Inc. should be required to participate with the other major developers in the area on the preparation and implementation of the Ewa Region transportation master plan. This is a combined effort between the developers and all levels of government to identify and implement the transportation improvements required for the entire Ewa Region.

The roadway requirements for this proposed project should be contingent upon the results of the master plan.

The applicant should coordinate their involvement through Campbell Estate, who has been spearheading the master plan effort.

2. The State is proposing to acquire a portion of the Barbers Point Naval Air Station for a future general aviation reliever airport that will also serve the U.S. Coast Guard and the Hawaii National Guard. Consequently, the proposed development may be subject to potential aircraft overflights in and out of the airport.

Ms. Cheryl D. Soon
Page 2
March 22, 1995

STP 8.6656

We appreciate the opportunity to provide comments.

Very truly yours,



KAZU HAYASHIDA
Director of Transportation

c: Mr. Mike Angotti - Schuler Homes, Inc.
~~Ms. Leslie Karsant~~ - Helber Hastert & Fee
Mr. Gary Gill - OEQC



University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

March 9, 1995

RE: 658

Mr. Brian Suzuki
City and County of Honolulu
Planning Department
650 South King Street
Honolulu, Hawaii 96813

MAR 13 1995

Dear Mr. Suzuki:

Draft Environmental Impact Statement (EIS)
East Kapolei Project
Ewa, Oahu

Schuler Homes, Inc. proposes to construct 10,000 residential units in Kapolei over a 15-year period in two phases. Phase 1 will begin in 1997. Two 8-acre elementary school sites, two 10-acre neighborhood parks, a 25-acre district park and three commercial shopping areas are also planned. The project site will be adjacent to the proposed University of Hawaii, West Oahu Campus. Roughly 30% of the Kapolei homes will be designated as affordable to families earning below 120% of the median income, and 60% of the homes affordable to families earning below 140% of the median income. In order to proceed with this project, the applicant is also requesting an amendment to the City and County of Honolulu's Development Plan Land Use Map for Ewa. Redesignation of 1,104 acres from Agriculture to Low Density Apartment, Parks and Recreation, Public and Quasi-Public and Commercial is sought.

We have reviewed this document with the assistance of Paul Ekern, Emeritus; Peter Flachsbart, Urban and Regional Planning; Jon Matsuoka, Social Work; David Penn, Geography; and Malia Akutagawa of the Environmental Center.

Conflicts Over Water Appropriation

We are concerned about the possible conflicts over water appropriation. Attached to the Potable Water Master Plan, Appendix J, is a letter by D.B. Goth of the Estate of James Campbell (dated

October 6, 1994) referring to the Ewa Shaft (EP 15 & 16) suggested as the primary water source for the East Kapolei project; it states that

... the Estate intends to reserve all water rights with respect to the lands that Schuler intends to acquire from the Estate for this project. These rights include the ownership and operation of the Ewa Shaft which will be a water source for the Estate's activities ... loss of the Ewa Shaft through eminent domain or regulation, or both, would entitle the Estate to substantial compensation, not only for such loss, but also for loss of value to the Estate's surrounding lands ... we would prefer that you delete any references to the Ewa Shaft as a potential water source.

Since there is an ensuing conflict between the Board of Water Supply and Campbell Estate over the Ewa Shaft and since other water sources located offsite are currently unavailable (as stated on p. 1 of Appendix J), it seems presumptive for Schuler Homes to have proceeded this far with its development. None of the developer's elaborate plans may be implemented without water. It is difficult to rely on a water plan based on uncertain water sources.

As to the question of eminent domain (that the state may take private property provided it justly compensates the landowner), how does the Board of Water Supply propose to obtain the water rights to the Ewa Shaft? Will the State itself or the developer incur the cost of compensating Campbell Estate for the loss of its water source and diminution in value of its lands?

Climate

Section 4.1 on Climate is inadequate. There is no assessment of evaporation rates and water demands. The document should include estimated changes in air temperature when sugar irrigation operations cease.

Water Needs

Section 4.5 on Groundwater Resources lacks an assessment of the caprock water balance as it relates to changing land uses from a predominantly agricultural area to a residential and commercial one. There has been a series of changes in the caprock water due to sugar cultivation. Furrow irrigation which was first implemented operated at 30% efficiency for deep percolation, drip irrigation operated at 80% efficiency, and now with the closing of the sugar industry, recharge will be reduced. Residential and commercial landscaping will contribute very little water to the caprock aquifer.

Appendix G on Impact on Agriculture pays little attention to irrigation needs. The Draft EIS did not mention the implementation

of xeriscapes which was suggested by R.H. Sato of the Board of Water Supply in a letter dated, January 6, 1995. Recommendation 6 reads, "Water efficient landscaping should be utilized to reduce the irrigation demand." This is important since the Ewa region is relatively dry.

The document completely dismisses the caprock aquifer as a nonpotable source for irrigation. Tables 1 and 2 of Appendix J provide balances for potable water only, and these balances are incomplete. If the document refers to the use of 400-500 GPD for irrigating lawns and pools, this value is too small. How realistic are the data presented in these tables. A separate irrigation system is mentioned, but from where will the water be imported? Does water importation from the Waiahole Ditch make an important contribution as a potable and nonpotable water resource?

Drainage

More attention needs to be given to drainage and storm water recharge issues in Chapter 6. Recommendations for using and retaining storm water for irrigation should be included. Mention was made of detention basins for retaining water for silt deposition, but will this water also be used for recharge? Natural ravines or grassways should be used instead of concrete channels. In doing so, natural processes will be utilized to facilitate draining with a greater likelihood of increasing ground water recharge in the area and mitigating impacts on ocean and shoreline resources at points of discharge.

Air Quality and Traffic

More recent data than September 1988 should be used in deriving automotive emission factors for CO for the years 2005 and 2011. (Appendix I, p. 13) We concur with the developer that traffic problems will be alleviated so long as it complies with the recommendations set forth in the Traffic Impact Assessment Report. (See Appendix K, p. 37-38)

It is unclear in the Draft EIS what type of street pattern will be used for this project. We assume that an arterial street will be constructed to keep traffic out of residential streets, thereby insuring a more quiet, peaceful neighborhood atmosphere, and keeping developer costs down. The downside of this arterial design is that it encourages traffic overload on arterial streets and discourages bus service, bicycling, and pedestrian activity in the area. Thus, the recommendations set forth in the Draft EIS may be defeated by such a design.

We suggest that the developer would be more successful in mitigating traffic impacts by engaging in neo-traditional town planning principles through the employment of a grid type street network. Other states have favored this model. (For more

information, see Toward the Architecture of Community: New Urbanism, by Peter Katz). We realize that development costs would increase with the utilization of this model, nevertheless, it is more cost-effective in the long run, will provide an incentive for home buyers to settle in Kapolei, and will encourage alternate methods of transportation, namely carpooling and bus services, bicycling, and pedestrian activity. Bike paths placed on main collector streets is a good idea. More connections between the project site and the proposed University Campus will also aid in alleviating traffic problems.

Socio-Economic Environment

Overall, Chapter 5 on the Socio-Economic Environment was adequate. However, quality of life issues were not addressed. How will the housing divisions be designed to enhance community cohesion?

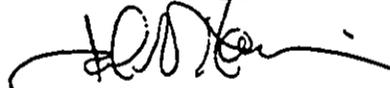
This section also mentioned the State's plans to build the University of Hawaii, West Oahu campus adjacent to the Kapolei project site. Now that it is unlikely that the University project will be approved, what are the implications in regards to the East Kapolei development? Will it alter traffic estimates? How will potential businesses and the community-at-large be affected?

Conclusion

Overall, the document was well drafted and covered the critical issues. As stated previously, certain issues need to be addressed more fully and may be dealt with in the Final EIS. Our greatest concern is that water conflicts with Campbell Estate be resolved before this project proceeds.

Thank you for the opportunity to review this Draft EIS.

Sincerely,



John T. Harrison
Environmental Coordinator

cc: OEQC
Roger Fujioka
Paul Ekern
Peter Flachsbart
Jon Matsuoka
David Penn
Malia Akutagawa

Helber Hastert
Planners

April 7, 1995

Mr. John T. Harrison
Environmental Coordinator
University of Hawaii at Manoa
Environmental Center
Crawford 317, 2550 Campus Road
Honolulu, Hawaii 96822



Dear Mr. Harrison:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 9, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

Conflicts Over Water Appropriation

Schuler Homes is working closely with the Honolulu Board of Water Supply to secure sufficient water source for the project. The developer has prepared a water master plan for the East Ewa region identifying all required storage and transmission facilities which has been submitted to the BWS. At the present time, however, firm commitments for water source have not been obtained although it is the developer's opinion that commitments can and will be obtained in the near future. Notwithstanding this, we have revised the FEIS to include water source as an unresolved issue.

Climate

The DEIS states that the average rainfall is slightly over 20 inches and includes a discussion on temperature ranges and wind regimes affecting the site. Evaporation on the Ewa plains has heretofore only been significant for the purposes of monitoring and estimating water needs for sugarcane crops. We do know that evaporation levels on the Ewa plain are high and primarily driven by wind energy. Due to the fact that the tradewinds will continue to be the primary influence on the climate in the area, it is not anticipated that development of the site will significantly impact regional climatic conditions.

The change in land use from a predominantly agricultural use to a residential use in part results from the closure of Oahu Sugar Company, which has already occurred without the influence of the proposed project. Changes in air temperature and/or groundwater

Helber Hastert & Fee
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Hellber Hastert

Planners

Mr. John T. Harrison

April 7, 1995

Page 2

recharge which occur when sugar operations cease are not attributable to the East Kapolei development. The urbanization of the area will significantly alter the microclimate of the project area from one associated with agriculture to one associated with a fully-developed residential area. Experience from adjacent development projects indicate a strong market demand for homes in the area, and therefore changes in microclimate resulting from urbanization will not affect project feasibility.

Water Needs

It is not anticipated that the East Kapolei project will have a significant impact on the caprock water balance. This statement is primarily based on the fact that during the peak sugar production periods on the Ewa plains, the water requirement from the caprock aquifer needed for sugarcane irrigation was between 14 and 16 mgd. Currently, this demand has reduced to 0 mgd with the cessation of sugarcane cultivation. It has been estimated (Tom Nance, Water Resource Engineer) that if all the non-potable land uses on the Ewa plains were developed and served with caprock aquifer water, the total demand could be 8 mgd. Presently, only a small portion of this non-potable requirement is in place.

The methods by which the caprock aquifer is recharged are rainfall, irrigation and basalt leakage. Researchers such as T. Giambellucca, Water Resources Research Center, have studied Central Oahu and the Ewa Plains and have suggested that recharge through residential irrigation and commercial irrigation can be significant. In particular, recharge potential was measurable as compared to areas where no irrigation was occurring (i.e., fallow sugarcane fields).

Based on the foregoing general observations, the East Kapolei project will still be providing recharge potential to the caprock aquifer while having no requirement for withdrawal.

The East Kapolei project is a residential project which, based on Board of Water Supply policies, does not require the use of nonpotable water. The Draft EIS identifies project requirements to provide public elementary schools and parks. These raw land parcels will be dedicated to the Department of Education and City Department of Parks and Recreation, respectively. Development of the facilities will be the responsibility of the respective agencies. The East Kapolei project will not have a direct responsibility for infrastructure improvements for these facilities. These facilities will have to respect the rules and regulations for use of nonpotable water. If nonpotable supply is available, we anticipate that the source will be developed.

Helber Hastert

Planners

Mr. John T. Harrison

April 7, 1995

Page 3

Drainage

The drainage discussion in Chapter 6 of the EIS has been revised to provide additional detail on drainage and storm water recharge issues. The proposed concrete channel within the North-South Road right-of-way is a regional drainage improvement for the Kalo Gulch tributary, serving a large upland area (encompassing several developments), a small percentage of which includes the western portion of East Kapolei. The size and alignment of the drainage channel, as well as the decision to utilize a concrete channel rather than a natural grass channel were determined by the State when the location of the University of Hawaii-West Oahu campus was planned, independent of the East Kapolei project. Notwithstanding this, due to the overall grades involved and the relatively large volume of upland stormwater, the grass swales would need to be in the order of 1,800-feet wide to keep from being torn up. This would encompass a land area of about 400 acres between Farrington Highway and the Ewa Villages project--almost half of the planned 900 residential acres within the proposed East Kapolei project. The impact of losing residential acreage, plus the fact that the project-related stormwater contribution is relatively small make the use of a grass swale not feasible. The use of a grass-lined channel south of Ewa by Gentry (where more level terrain allows for narrower swales) for access to the ocean outlet remains a possibility.

Air Quality

The age distribution of registered vehicles in Honolulu has not exhibited great variation over the years, and therefore does not have a significant impact on computed emission factors. In response to your comment, our air quality consultant (Jim Morrow) obtained March 1992 data and reran the emissions model. The results indicated less than a 0.5 percent difference, leading to the conclusion that there would be no significant change in the study's findings or conclusions by using more recent data.

Traffic

The project's internal road system is designed as a spine and internal loop layout, with the major arterial road providing access to both phases of the development. The internal roadway design will be based on capacity checks and an evaluation of laneage requirements. As such, there should be no major "overload" on the collector-distribution road within the project. Bus service can be provided to serve the major use areas of the project such as the multi-family and commercial areas.

The impact of neo-traditional land use patterns on vehicle use and other traffic issues is still in an initial phase as a major traffic research topic. At present, there is a lack of available data to support the conclusion that neo-traditional design will result in a reduction in overall vehicle use. Bicycling and pedestrian activity is primarily a function of

Helber Hastert

Planners

Mr. John T. Harrison

April 7, 1995

Page 4

distance to and from major destinations, as well as the availability of bikeways and pedestrian ways. While the retail, office and government (employment) center in the City of Kapolei is beyond walking distance from the East Kapolei project, the primary intent is to focus commuter trips there, away from the Primary Urban Center.

Schuler Homes is the leading home developer in the State and is keenly aware of changing market trends and housing design. It is closely following the evolving discussion of neo-traditional design and looks forward to reviewing the Katz report mentioned in your letter. The project site is uniquely located adjacent to the proposed West Oahu Campus and will be largely self-sufficient with regard to neighborhood commercial and elementary school needs. Because of the relatively flat terrain, the developer recognizes the significant opportunity to promote pedestrian, bicycle and transit use within the project area through appropriate planning and design, thereby reducing automobile dependence.

Socio-Economic Environment

Quality of life issues are thoroughly addressed in the Socio-Economic Impact Assessment by Community Resources, Inc. (CRI) (Appendix E of the EIS) and summarized in Chapter 5 of the EIS. Chapter 5 of the CRI report addresses the questions of area resident's sense of compatibility of the project with surrounding land uses, and quality of life impacts are systematically addressed in Chapter 6.

The State has made a strong commitment to develop the planned University of Hawaii West Oahu campus across the North-South Road from the project. We have no indication that it is "unlikely" that the campus will be located there, and feel it prudent to assume that the University will be built in estimating traffic and other impacts in the EIS.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners



Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

FEB - 7 1995

PB 95-60

February 1, 1995

MEMO TO: PLANNING DEPARTMENT
ATTN: BRIAN SUZUKI
FROM: RANDALL K. FUJIKI
DIRECTOR AND BUILDING SUPERINTENDENT
SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
EAST KAPOLEI PROJECT

We have reviewed the subject DEIS and have no comments to offer.



RANDALL K. FUJIKI
Director and Building Superintendent

CN:jo

cc: G. Tamashiro
Office of Environmental Quality Control
Schuler Homes, Inc. (M. Angotti)
Helber Hastert & Fee, Planners (L. Kurisaki) ✓

Helber Hastert
Planners

April 3, 1995

Mr. Randall K. Fujiki
Director and Building Superintendent
Building Department
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813



Dear Mr. Fujiki:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your memorandum to the City and County Planning Department dated February 1, 1995 responding to our request for comments on the above-referenced DEIS. We note that you have comments at this time. We appreciate your review of the DEIS. Your memorandum will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



COPY

March 8, 1995

MAR 14 1995

TO: CHERYL D. SOON, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

ATTN: BRIAN SUZUKI

FROM: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY *Raymond H. Sato*

SUBJECT: YOUR LETTER OF JANUARY 24, 1995 ON THE DRAFT
ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR THE PROPOSED
EAST KAPOLEI PROJECT, TMK: 9-1-17: 04, EWA, OAHU, HAWAII

Thank you for the opportunity to review and comment on the DEIS for the proposed East Kapolei Project. Our previous comments of January 6, 1995, to Helber Hastert & Fee on the Environmental Impact Statement Preparation Notice which are still applicable, have been addressed in the DEIS.

We have the following additional comments to offer:

1. We understand there are some differences in the water demands of the DEIS and water master plan due to adjustments in project boundaries. If the water requirements should change substantially, the water master plan should be resubmitted for our review and approval. The final EIS should include the approved water master plan or the most current version.
2. Board of Water Supply Rules and Regulations Section 1-112, state that if a suitable nonpotable water supply is available, existing water services will be required to use nonpotable water for large landscaped areas such as schools and parks. Provisions in the DEIS should indicate this possibility for the school and park sites due to the caprock resource in the project area.

cc: Office of Environmental Quality Control
Schuler Homes, Inc.
✓ Helber Hastert & Fee, Planners

Helber Hastert
Planners

March 31, 1995

Mr. Raymond H. Sato
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 S. Beretania Street
Honolulu, Hawaii 96843



Dear Mr. Sato:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 8, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

1. You are correct that the water demand used in the Draft EIS water master plan will be undergoing minor modifications due to subsequent adjustments of project boundaries and refinement of land uses. We do not believe that the cumulative change to the water master plan will be significant. However, we will be providing updates as new information becomes available. The FEIS includes a copy of the most current water master plan, which at this time is the one which was included in the DEIS.
2. The Draft EIS is for the East Kapolei project. The East Kapolei project is a residential project which, based on BWS policies, does not require the use of nonpotable water. The Draft EIS identifies project requirements to provide public elementary schools and parks. These raw land parcels will be dedicated to the Department of Education and City Department of Parks and Recreation, respectively. Development of the facilities will be the responsibility of the respective agencies. The East Kapolei project will not have a direct responsibility for infrastructure improvements for these facilities. These facilities will have to respect the rules and regulations for use of nonpotable water. If nonpotable supply is available, we anticipate that the source will be developed.

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Helber Hastert
Planners

Mr. Raymond H. Sato
March 31, 1995
Page 2

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869



JEREMY HARRIS
MAYOR

RICHARD R. SETO-MOOK
FIRE CHIEF

ERNEST Y. SUEMOTO
FIRE DEPUTY CHIEF

February 2, 1995

FEB - 6 1995

TO: CHERYL SOON, DIRECTOR
PLANNING DEPARTMENT

ATTN: BRIAN SUZUKI

FROM: RICHARD R. SETO-MOOK, FIRE CHIEF

SUBJECT: EAST KAPOLEI PROJECT
TAX MAP KEY: 9-1-17: 04 (POR)

We have reviewed the subject material provided and have no additional comments.

Should you have any questions, please call Assistant Chief Attilio Leonardi of our Administrative Services Bureau at 831-7775.

Richard R. Seto-Mook
RICHARD R. SETO-MOOK
Fire Chief

AKL:lm

cc: Schuler Homes, Inc. (Attn: Mike Angotti)
Helber Hastert & Fee, Planners (Attn: Leslie Kurisaki)
Office of Environmental Quality Control w/EIS report

Helber Hastert
Planners

April 3, 1995

Acting Chief Jacob Kaleikini
Fire Department
City and County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869



Dear Chief Seto-Mook:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

We would like to acknowledge the letter from former Chief Richard Seto-Mook to the City and County of Honolulu Planning Department dated February 2, 1995 responding to our request for comments on the above-referenced DEIS. We note that the Fire Department had no additional comments. We appreciate your department's review of the DEIS. The letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
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DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 5TH FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4427 • FAX: (808) 527-5498

JEREMY HARRIS
MAYOR



RONALD S. LIM
DIRECTOR

ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR

MAR 16 1995

March 10, 1995

MEMORANDUM

TO: Cheryl D. Soon, Director
Planning Department

ATTENTION: Brian Suzuki

FROM: Ronald S. Lim, Director
Department of Housing and Community Development

SUBJECT: East Kapolei Project
Draft Environment Impact Statement

The Department of Housing and Community Development (DHCD) has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed East Kapolei Project to be developed by Schuler Homes and Hawaii Trust Company, Ltd. The project will consist of approximately 10,000 housing units planned in two phases over a 15 year period.

The City's West Loch Estates and Fairways Subdivision and Ewa Villages Revitalization projects lie in close proximity to the proposed East Kapolei project. The DEIS states that storm runoff will increase substantially upon development of the tributary areas. The proposed project would impact both of the City's projects in terms of flooding.

The proposed project spans portions of two separate drainage basins: the Kaloi Gulch Drainage Basin which collects storm runoff from the western portion of the project area; and the West Loch tributary basin which collects the east side flows. The developer proposes to connect the on-site drainage system for the East Kapolei project to the West Loch drainage system currently being designed. The developer also proposes to develop a concrete channel/culvert from the project boundary passing underneath Fort Weaver Road that would connect to an existing City detention basin. The western portion of the East Kapolei project would include on-site drainage improvements which will connect to the existing drainage mauka of the Ewa Villages and to the Kaloi Gulch Channel within the proposed North-South Road corridor.

Mr. Brian Suzuki
March 13, 1995
Page 2

Discussions regarding the West Loch Basin and the Kaloi Gulch Tributary plans are ongoing with the Department of Public Works, our Department and other developers within the area. Pending implementation of the West Loch Basin and Kaloi Gulch Tributary drainage plans, the proposed project, located within a 100-year flood plain area, should have its own drainage detention basins to take care of any storm runoff. This would ensure that the West Loch Fairways drainage detention basin, the Ewa Golf Course and its storm detention basins are not adversely affected.

The DEIS states that 60 percent of the units will be affordable to families earning less than 140 percent of median income. At the City's request, ten percent of the units in the project will be affordable to households with incomes below 80 percent of Oahu's median income limit, as determined by the U.S. Department of Housing and Urban Development, adjusted by family size, and an additional 20 percent of the total units will be affordable to families with incomes between 81 and 120 percent of Oahu's median income.

Should you have any question, please contact Charlotte Yoshioka of our Planning and Analysis Division at 527-5090.

Thank you for the opportunity to comment.

Sincerely,



RONALD S. LIM
Director

cc: Office of Environmental
Quality Control
Schuler Homes
Helbert Hastert & Fee

Helber Hastert
Planners

March 31, 1995

Mr. Ronald S. Lim, Director
Department of Housing and Community Development
City and County of Honolulu
650 S. King Street, 5th Floor
Honolulu, Hawaii 96813



Dear Mr. Lim:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 10, 1995 responding to our request for comments on the above-referenced DEIS.

Several alternatives to onsite detention/retention are being proposed for Kaloii Gulch and West Loch. If the alternatives are not adopted, onsite detention/retention facilities meeting City and County requirements will be provided.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

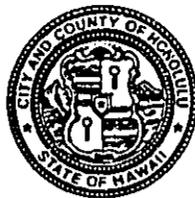
Helber Hastert & Fee
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DEPARTMENT OF HUMAN RESOURCES
CITY AND COUNTY OF HONOLULU

STANDARD FINANCE PLAZA
715 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
MAYOR

SALVATORE S. LANZILOTTI, ED.D.
DIRECTOR

ROBERT AGRES, JR.
DEPUTY DIRECTOR

ADMINISTRATION
2ND FLOOR: (808) 527-5311
FAX: (808) 523-4074

ELDERLY AFFAIRS DIVISION
HONOLULU COMMITTEE ON AGING
5TH FLOOR: (808) 523-4761

WORKHAWAII DIVISION
5TH FLOOR: (808) 523-4102

SPECIAL PROJECTS SECTION
HONOLULU COUNTY COMMITTEE ON THE STATUS OF WOMEN
MAYOR'S COMMITTEE FOR PERSONS WITH DISABILITIES
MAYOR'S CHILD CARE ADVISORY BOARD
5TH FLOOR: (808) 527-6264

February 24, 1995

MEMORANDUM

MAR - 2 1995

TO: CHERYL D. SOON, DIRECTOR
PLANNING DEPARTMENT

ATTN: BRIAN SUZUKI

FROM: SALVATORE S. LANZILOTTI, Ed.D., DIRECTOR
DEPARTMENT OF HUMAN RESOURCES 

SUBJECT: **DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)**
EAST KAPOLEI PROJECT, EWA, OAHU, TMK: 9-1-17: 04 (por)

The Department of Human Resources (DHR) has reviewed the subject matter cited above and offers the following comments:

We understand that the proposed project, when completed, will be comprised of 10,000 dwelling units and approximately 28,000 residents. We anticipate that a fair percentage of these dwelling units will be targeting young families, particularly those units that will be designated as affordable. Although the applicant has made allowances for the increased demand in educational services, there will also be a need for quality affordable child care services as well. Also, once the proposed University of Hawaii - West Oahu campus project is completed, there will be a much stronger demand for child care services as generated by its faculty, employees and students in Kapolei, Oahu.

EAST KAPOLEI PROJECT - DEIS

February 24, 1995

Page Two

Therefore, we ask that the applicant provide the City and County of Honolulu with a minimum of 2 acres in each phase of the project or a cash equivalent for the construction of a facility that will be able to provide quality child care services for the East Kapolei residents within the project's immediate vicinity. For example, there is a possibility that a child care facility may be placed on a City park site. Therefore, the applicant in its provision of land to the City for park purposes may provide the necessary capital for the construction of a child care facility on this parcel in lieu of additional land. Of course this option is only available if the child care facility does not interfere with activities projected for the parcel by the City's Department of Parks & Recreation.

Irrespective of the option chosen by the applicant, the land and/or funds would enable the City & County of Honolulu to service a cross-section of the community as it is our intention to design a facility that is multi-generational in usage (i.e. youth/senior/child care center). This concept allows the center to evolve into other social service functions as the population ages and different human service needs arise.

Finally, we ask that the applicant consider designating a fair percentage of dwelling units as affordable rentals as well as the inclusion of an elderly housing component. These types of housing units are at a critical shortage and will continue to be in high demand in the immediate future. If we are to continue to look to the Kapolei region as the "Second City," then, future residential projects must be sensitive to the needs of the whole community and the inclusion of the aforementioned housing components is a positive step in that direction.

If you have any questions or require further clarifications regarding our comments, please direct your inquiries to Mr. Ernie Martin of our department's *Special Projects Section* at X-6264.

Thank you for the opportunity to comment on this matter.

cc: Brian J.J. Choy, Director
Office of Environmental Quality Control
Mike Angotti, Director of Land Services
Schuler Homes, Inc.
✓ Leslie Kurisaki, Project Planner
Helber Hastert & Fee, Planners

Helber Hastert
Planners

March 27, 1995

Dr. Salvatore S. Lanzilotti, Ed.D., Director
Department of Human Resources
City and County of Honolulu
Standard Finance Plaza
715 S. King Street
Honolulu, Hawaii 96813



Dear Dr. Lanzilotti:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated February 24, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

Child Care

As you note, the East Kapolei project will house many young families needing child care. Child care facilities capable of helping those families exist in the City of Kapolei's new child care center and in churches in the surrounding area.

Child care is a concern of parents, relatives, child care providers and friends and neighbors in a functioning community. No one approach to child care, such as the large center being built at the Kapolei Civic Center, meets the needs of all families. Many families in Hawaii strongly prefer to have relatives care for their children. Others place their young children in child care centers, but prefer ones near their place of work. Others seek family day care homes, especially for their younger children. Churches are also taking a lead role in providing community child care services, and will undoubtedly be providing such services within the new East Kapolei community. One step that the developer can take to support families is to write the Covenants and Restrictions for the project to allow registered family day care homes to be operated in the project.

With a campus of the University of Hawaii across the road, we think it is likely that a child care center will be located there, as currently exist at the University of Hawaii at Manoa and several community colleges. Such a center would provide care that is convenient to work or school for parents at the University, and would further help to train child care professionals needed in Hawaii. We expect the eventual University child care center, along with private and City day care facilities in the area, to go far toward providing quality day care for families in the project who seek this option.

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Helber Hastert
Planners

Dr. Salvatore S. Lanzilotti
March 27, 1995
Page 2

In summary, the applicant believes child care services are and will continue to be delivered in an adequate manner, and that the requirement for new, public child care facilities within the project would not be appropriate.

Affordable Rentals and Elderly Housing

The project will meet its overall affordable housing requirements through provision of 30 percent of units at prices affordable to families earning up to 120 percent of median income, including a commitment to provide 10 percent of units at prices affordable to families earning up to 80 percent of median income. The developer is willing to discuss the potential for affordable rentals and elderly housing as part of the project.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBERT HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU650 SOUTH KING STREET
HONOLULU, HAWAII 06813 • (808) 523-4432JEREMY HARRIS
MAYORPATRICK T. ONISHI
DIRECTORLORETTA K.C. CHEE
DEPUTY DIRECTOR

95-00404 (DT)

April 7, 1995

APR - 7 1995

MEMORANDUM

TO: CHERYL D. SOON, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

ATTN: BRIAN SUZUKI

FROM: PATRICK T. ONISHI, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

SUBJECT: COMMENTS TO DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
FOR THE EAST KAPOLEI PROJECT

We have reviewed the Draft EIS for the above-described project and have the following comments:

1. The following two alternatives were not discussed in the Draft EIS and should be included in the Final EIS:
 - a. Full build-out permitted under the requested Development Plan (DP) designations. This discussion should include impacts on the demand for commercial and other accessory land uses, and infrastructure. This should be based on the maximum development potential of 30 dwelling units per net acre or approximately 27,000 dwelling units; and
 - b. A revised DP land use pattern which reflects the stated goal of 10,000 dwelling units as the maximum potential number of dwelling units under the proposed DP designations.
2. The Final EIS should discuss the types of Best Management Practices that will be implemented to prevent construction runoff from eventually entering the ocean.

CHERYL D. SOON, CHIEF PLANNING OFFICER
Page 2
April 7, 1995

Thank you for the opportunity to comment. If you have any questions, you may contact Dana Teramoto of our staff at 523-4648.


PATRICK T. ONISHI
Director of Land Utilization

PTO:am

cc: Helber Hastert & Fee (Ms. Leslie Kurisaki)
Schuler Homes, Inc. (Mr. Mike Angotti)

kapole12.djt

Helber Hastert
Planners

April 10, 1995



Mr. Patrick T. Onishi, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Onishi:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your memorandum to the City and County of Honolulu Planning Department dated April 7, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

1. Recommendation for analyzing "potential" DP land use buildout of 27,000 units. The applicant has requested 902 acres of the LDA DP land use designation to permit planning flexibility in siting projects of varying residential densities throughout the project site. The EIS clearly states that the overall project objective is to construct 10,000 homes in residential densities ranging from 7 to 20 du./acre, with an overall average density of approximately 11 du./acre (10,000 units/902 gross residential acres). All of the project's associated impact analysis studies have assumed 10,000 units as the basis of analysis. Indeed, the project's market study indicates a demand for between 8,500 and 13,200 homes within the market area by 2010. Although this is a significant demand, it would not warrant development of the high density development suggested in your letter (i.e., 27,000 units). The applicant's request permits needed flexibility to produce both multi-family and single-family units, thus we believe it would be inappropriate to evaluate the "potential" LDA multi-family buildout density of 30 du./acre.

As a seasoned homebuilder, Schuler Homes feels very strongly that the density and height limit restrictions presently placed on the "Residential" DP Land Use Category (up to 12 units per acre and up to 25 feet in height) are too restrictive to impose at the Development Plan-stage of planning and design development. The ability to identify the location of single- and multi-family residential lots at this time, assumes a level of site planning and design development which we believe far exceeds the intent of the DP planning process. This problem is exacerbated because while Schuler Homes wants to achieve overall average densities of approximately 11 du./ac., it also desires to integrate varying residential densities within development parcels and neighborhoods. Unlike more traditional projects

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Planners

Mr. Patrick T. Onishi

April 10, 1995

Page 2

where residential density is segregated into enclaves, Schuler intends to mix residential densities within neighborhoods to promote better socio-economic integration and to permit greater flexibility to adapt to changing market conditions and taste. While we believe that zoning is a more appropriate stage to identify specific housing types and densities, even at the zoning level the City needs to be sensitive to the significant external forces acting on the homebuilder, such as changing market tastes, fluctuating interest rates, competition, and economic conditions which require the homebuilder/developer to continually re-evaluate its product mix, including density and height. Accordingly, zoning controls should be more flexible in allowing modifications to site plans within some overall parameters/standards, rather than rigid, lines-on-the-map legal agreements. Recent efforts by the City in streamlining the development review process have gone a long way in addressing this concern.

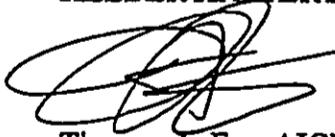
2. Best Management Practices which will be implemented to prevent construction runoff from eventually entering in the ocean can take many forms. Through the NPDES programs, specific practices are developed for each grading plan or construction plan which is developed. However, general features of Best Management Practices include the following:

- Limited areas of grading.
- Use of silt curtains.
- Use of berms to divert and control runoff.
- Use of sedimentation basins.
- Use of grassing and vegetative cover as soon as possible.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners



Thomas A. Fee, AICP
Vice President

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
MAYOR

DONA L. HANAIKE
DIRECTOR

ALVIN K.C. AU
DEPUTY DIRECTOR

February 22, 1995

MAR - 3 1995

TO: CHERYL SOON, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

FROM: DONA L. HANAIKE, DIRECTOR

SUBJECT: EAST KAPOLEI PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

We are encouraged that the applicant, Schuler Homes, Inc., has increased the public park areas planned for the new community. Although the present proposal does not completely satisfy park dedication requirements, we look forward to continued discussions with the applicant to discuss how this project can meet the recreational needs of the new residents of the East Kapolei community.

Among the issues that we look forward to resolving in our continued discussions with Schuler Homes, Inc. will be: exact park location, size, and design as well as additional measures that they will be taking to complete conformance with the Park Dedication Ordinance.

Based on Schuler Homes, Inc.'s revised population estimates of 28,000 new residents, the City's standards for parks dictate that their project should provide the new population with 58 acres of park lands.

Cheryl Soon
Page 2
February 22, 1995

If you have any questions, please call John Morihara of our
Advance Planning Branch at 523-4246.



For DONA L. HANAIKE
Director

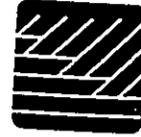
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cc: Office of Environmental Quality Control
Mike Angotti, Schuler Homes, Inc.
✓Leslie Kurisaki, Helber Hastert & Fee

Helber Hastert
Planners

March 27, 1995

Ms. Dona Hanaike, Director
Department of Parks and Recreation
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813



Dear Ms. Hanaike:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County Planning Department dated February 22, 1995 responding to our request for comments on the above-referenced DEIS. We note that based on the City and County's Park Dedication Ordinance (PDO) formula, the project generates a requirement of 39 acres of park space, based on the proposed mix of single and multi-family units. The East Kapolei project provides 45 acres of community and district parks which will be dedicated to the City and County, exceeding the PDO requirement.

Based on the Development Plan standard (2 acres per 1,000 residents), the project's 28,000 residents would require 56 acres of open space and recreational area. In addition to the 45 acres of dedicated public park space, additional open space and park areas will be provided and maintained by homeowners associations within the East Kapolei project.

We also note that the Department of Parks and Recreation is actively involved in planning new parks for Ewa, and is considering possible future development of up to 1,100 acres of park space at the Barbers Point Naval Air Station. This would provide significant regional park resources available to project residents.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

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PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR



CHERYL D. SOON
CHIEF PLANNING OFFICER
CAROLL TAKAHASHI
DEPUTY CHIEF PLANNING OFFICER

March 10, 1995

BS 1/95-0039

Helber Hastert & Fee, Planners
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

MAR 14 1995

Attn: Leslie Kurisaki, Project Manager

Gentlemen:

Comments to the Draft Environmental Impact Statement
East Kapolei Project, PD No. 95/E-1,
Tax Map Key: 9-1-17: 04 (Por), Ewa, Oahu

In response to the subject Draft Environmental Impact Statement (DEIS) report, we are submitting the following comments.

Drainage

We concur that impacts associated with drainage remains an unresolved issue at this time. Our concerns related to potential drainage impacts are as follows.

The Kaloi Gulch drainage concept to accommodate drainage for the western portion of the project proposes a 97-foot wide concrete-lined drainage channel running adjacent to the proposed North/South Road alignment. This concept would have a negative environmental and aesthetic impact to the project area and to makai urban development.

The Planning Department has been trying to encourage developers in the region to incorporate natural drainageways and natural detention areas (i.e. park space, etc.) into their projects to promote landscaping and to enhance open space. This planning concept would be environmentally beneficial and, at the same time promote an aesthetic method of accommodating drainage from urban development. Further, this concept and other creative ways of handling drainage on-site are consistent with the City's policies on stormwater detention. Specifically, the City is encouraging the handling of stormwater detention from

projects on-site to "utilize where feasible any open space including parking lots, landscaped areas, mini and community parks, and golf courses, private and public, to detain or infiltrate storm water flows to reduce their volume and runoff rates... (City Council Resolution 94-296)."

It appears that the proposed drainage channel would direct urban stormwater runoff unimpeded, through both the Ewa Villages and Ewa by Gentry projects. The proposed concept is contrary to previous drainage concepts and mitigation measures that have been required and implemented by adjacent residential projects (i.e. Ewa Villages and Ewa by Gentry). Previous projects followed City drainage best management requirements by detaining a major portion of stormwater runoff on-site to comply with project environmental requirements and to lessen the impacts of runoff on downstream projects.

In addition, the Final Environmental Impact Statement (FEIS) should address the concerns that have been previously stated by Ewa Villages and the Ewa by Gentry projects. These concerns are related to the potential negative impacts from directing stormwater runoff directly to the Ewa Villages and, concerns (expressed by Ewa by Gentry) that sedimentation, pesticides, etc. from runoff entering their drainage system would adversely impact their project and may put them in non-compliance with NPDES requirements and monitoring.

The FEIS should also address mitigation measures for the proposed West Loch drainage channel for the eastern portion of the project. As currently envisioned, the drainage channel would result in a loss of public park space for West Loch residents. There is currently a shortage of park space for residents in the area and based on projected development, the demand for park space will continue to increase in the future.

Further, the FEIS should discuss the potential cumulative impact of the proposed West Loch drainage project on the West Loch wildlife refuge. The Ewa by Gentry East residential project also proposes to direct stormwater runoff through a grass-lined channel to a drainage detention basin adjacent to the wildlife refuge. The cumulative environmental impact of runoff and associated pesticides, etc. from both basins in close proximity to a protected wildlife refuge needs to be addressed and studied in further detail.

Transportation and Traffic Impacts

We concur that impacts associated with traffic and necessary mitigation measures remain an unresolved issue at this time. Our concerns related to potential traffic impacts are as follows.

The traffic impact study should address the cumulative impacts of the proposed project and other proposed area projects on existing and proposed roadway facilities in the region. Specifically, the analysis should discuss the issue of timing and the impact of the University of Hawaii (UH) West Oahu campus, the Kapolei High School and other urban development that would have access to and utilize the planned North/South Road.

The issue of timing is critical since it is our understanding from the State Department of Transportation that Fort Weaver Road is currently at capacity during peak hours. While the study proposes future localized roadway improvements and mitigation measures, there is a need to address the timing of constructing an interchange for the North/South road and H-1 Freeway. Unless the North/South road interchange is constructed in conjunction with the proposed project, eastbound traffic flow from the project during peak hours may significantly impact Fort Weaver Road and the already congested Kunia interchange.

Further, the traffic study mentions the need for the developer to devise Transportation Systems Management (TSM) mitigation measures. The details of such TSM mitigation measures or contribution to any regional Transportation Management program should be discussed in the FEIS and developed and submitted to applicable City and State agencies prior to rezoning of the proposed project.

Water

We recommend that "water supply" be included as an unresolved issue and listed as a "Irreversible and Irrecoverable Commitment of Resources" in the FEIS report. The water study report in the DEIS identified the Ewa Shaft (EP 15 and 16) as a possible water source for the proposed project. However, it is our understanding that there may be possible conflicts for securing and utilizing that source.

The FEIS should discuss whether or not a viable and practical water source for the project can be secured by the developer within the projected development timeframe. In addition, the FEIS should address the issue of water use alternatives including the possibility of developing dual water lines and the utilization of non-potable water sources for irrigation purposes.

School Facilities

Based on responses submitted by the Department of Education (DOE) and other agencies (i.e. Housing Finance and Development Corporation), we recommend that the subject matter of "Schools" for the proposed project be addressed as an unresolved issue in the FEIS.

The response letter from the DOE, states that the potential impact on schools in the area will be "severe" based on the current project timetable. Projected enrollment figures by DOE indicate a need for two elementary school sites, one intermediate school, and "a need to plan another high school." The DOE notes that the schools in Kapolei "were not originally designed to include the East Kapolei development which is an additional burden on the schools."

The current concept master plan for the project indicates two elementary schools sites and no site for an intermediate school. The FEIS should address how this discrepancy between DOE school facilities requirements will be resolved before rezoning.

Fiscal Impact

The FEIS should discuss and provide additional information on the potential impacts of the proposed project on City operations and services. Specifically, operating budget impacts including future additional manpower and equipment requirements to service proposed project should be addressed.

It has been the experience of the City that new residential development on previously undeveloped land invariably leads to an increase in certain City services. For example, new residential development in Waikale, Village Park, Royal Kunia and Mililani has placed an increased demand on bus service to those areas. Over the years, new routes have been added to service those projects. This can be translated into additional manpower and equipment (i.e. new buses) to service those projects.

Thank you for the opportunity to comment on the subject document. Should you have any further questions on the matter, you may contact Brian Suzuki of our staff at 527-6073.

Sincerely,



CHERYL D. SOON
Chief Planning Officer

CDS:ft

Helber Hastert
Planners

April 7, 1995



Ms. Cheryl D. Soon
Chief Planning Officer
Planning Department
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Ms. Soon:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter dated March 10, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your letter and offer the following responses:

Drainage

Kaloi Gulch Concrete Drainage Channel

We acknowledge that the Planning Department seeks to encourage developers to incorporate natural drainageways and natural detention areas. However, we note that the proposed concrete channel within the North-South Road right-of-way is a regional drainage improvement for the Kaloi Gulch watershed, serving a large upland area (encompassing several developments and large areas of undeveloped land), a small percentage of which includes the western portion of the East Kapolei project. The size and alignment of the drainage channel were determined by the State independent of the East Kapolei project, during its land acquisition and planning for the North-South Road alignment. The proposed concrete channel is meant to replace a segment of the existing Kaloi Gulch which runs through the adjacent University site. The realignment of the gulch is seen as a benefit to the University which allows for increased flexibility in campus master planning and overall site utilization. Preliminary analysis prepared by the project engineers indicates that a grass-lined channel replacement for the proposed concrete channel would occupy a land area of about 400 acres (about 1,800 feet wide by 10,000 feet long) versus 20 acres for the concrete channel. Given the proposed average residential density of the East Kapolei project (11 units/acre), this would displace 4,400 homes from the project if built entirely onsite.

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Heber Hastert

Planners

Ms. Cheryl D. Soon

April 7, 1995

Page 2

Kaloi Gulch Detention Basin

In proposing that the Kaloi Gulch improvements include construction of a detention basin within the Laulani property, we are suggesting that the best management practice concerning drainage is to provide a regional solution. Of the 8,000 cfs entering the Ewa Villages project, the East Kapolei project will contribute about 600 cfs (7.5% of the total). 6,000 cfs is generated from undeveloped land above the H-1 Freeway and the remaining 1,400 cfs will be generated by the University of Hawaii West Oahu campus. Should onsite detention be provided, only the 600 cfs generated by the project will be detained. The remaining 7,400 cfs will be allowed to pass through.

The East Kapolei project will provide detention/retention for the purpose of reducing storm water volumes and improving water quality. These objectives are being sought with respect to receiving water quality (i.e., the ocean) as stated specifically in Resolution 94-296. These facilities are suggested offsite (Laulani) or onsite if a regional solution does not proceed. We are not aware of any specific and mandatory requirement that all detention/retention facilities be onsite to protect receiving water. The Laulani basin would also provide an extra means of protection for the marina.

The Kaloi Gulch basin detention requirement for the East Kapolei project is 100 acre-feet and could be provided onsite should the regional solution not be adopted. A total of 300 acre-feet of storage at the Laulani site is being proposed to accommodate both East Kapolei and the University.

West Loch

Concerning the West Loch drainage channel, the proposed improvements would not result in a loss of park space. The channel would be built within the existing cane haul road (Balfour Boulevard). The park now slopes down to the cane haul road, which ranges from 22 feet below the park at Fort Weaver Road to eight feet below midway. The road then gradually rises to match grade as it approaches the OR&L ROW.

The issue of potential impact of the West Loch drainage on the National Wildlife Refuge has already been addressed in the Environmental Assessment (EA) for the Ewa by Gentry-East Offsite Drainage Improvements dated December 1994. (See, for example, Marine Impact Study prepared by O.I. Consultants (December 1993), and U.S. Fish and Wildlife Service letter dated February 24, 1994 attached as appendices to the referenced EA). This project is not directing any additional flow into the drainage basin that was not previously master planned and addressed in the EA.

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Ms. Cheryl D. Soon

April 7, 1995

Page 3

Transportation and Traffic Impacts

The cumulative impacts of the proposed project and other area projects are included in the Traffic Impact Assessment Report (TIAR) by Pacific Planning and Engineering, Inc., attached as Appendix K of the DEIS. The University of Hawaii West Oahu campus, high school and other known developments were included in the land use scenario used to generate future traffic on the anticipated roadway network. The report also assumed traffic generated from other areas not mentioned in your letter (i.e., area between Farrington Highway and H-1 Freeway, and West Loch bluffs area).

The TIAR assumes the North/South Road/H-1 Freeway interchange as part of the road network in 2005 and beyond. The interchange has been assumed in most highway plans and was validated by the Oahu Metropolitan Planning Organization (OMPO) in its adopted description of the Ewa Highway Master Plan. The timing for this improvement is subject to current planning efforts of the State Department of Transportation. Further, any H-1 project would need a special study and approval by the Federal Highways Administration.

Transportation Systems Management (TSM) actions are predominantly designed for improving existing demand characteristics, transit and highway systems. Since much of the project and the Ewa region development is still in its early stages, a project plan now consisting of specific actions is premature. These actions might change or other actions might be more suitable as the region and the project develops. For example, bus coordination actions are pertinent, yet transit system plans for the area are not firm. Thus, working meetings are required as the project develops. Rather than plan details at this time, an agreement to work with the State Department of Transportation and City Department of Transportation Services to coordinate TSM actions for the project could be established.

Water

The EIS will include water source as an unresolved issue and list it as an "Irreversible and Irretrievable Commitment of Resources." Water storage and transmission systems are adequately described in the EIS and are not considered an unresolved issue.

The East Kapolei project is a residential project which, based on Board of Water Supply policies, does not require the use of nonpotable water. The Draft EIS identifies project requirements to provide public elementary schools and parks. These raw land parcels will be dedicated to the Department of Education and City Department of Parks and Recreation, respectively. Development of the facilities will be the responsibility of the respective agencies. The East Kapolei project will not have a direct responsibility for infrastructure improvements for these facilities. These facilities will have to respect the

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Ms. Cheryl D. Soon

April 7, 1995

Page 4

rules and regulations for use of nonpotable water. If nonpotable supply is available, we anticipate that the source will be developed.

School Facilities

The East Kapolei development includes two 8-acre elementary school sites. Although Schuler Homes concurs that a new intermediate school is needed in the area, it believes that the demand for the school is being generated by a number of developments in the area, and therefore, is more of a regional need than a direct result of this project. Schuler Homes has indicated to the State Department of Education that it is very willing to work with other adjacent landowners for the provision of an intermediate school site.

The DOE has also requested a "fair share" contribution toward development of a high school. Schuler Homes strongly believes that State-wide standards need to be established regarding "fair share" contribution for high school impact, and supports the DOE's ongoing efforts to develop such standards. Schuler Homes will willingly participate in Statewide impact fees which have been fairly established and are evenly applied.

Fiscal Impact

At your request, we have asked Community Resources, Inc. to research City and County operating costs attributable to the project, based on public records and input from City departments. This has turned out to be far more difficult than estimating revenues, in that:

- City and County records often show islandwide or regional costs, making it hard to estimate costs attributable to a single development.
- The fiscal impact of the project is in many cases smaller than the overall cost of providing services to project residents. The East Kapolei project will house existing Oahu residents, and not cause in-migration. Hence, City and County services are already being provided to them, and the cost impact is therefore the difference in cost due to providing services in Kapolei. Three examples illustrate the different ways such an impact must be analyzed.
 - Maintenance of new parks and roadways dedicated to the City and County--costs totally attributable to the development;
 - Extension of police services to a new area that had not been served earlier--costs only partly attributable to the development, since police protection would be extended to residents wherever they live, but not to their new homes in Kapolei; and

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Planners

Ms. Cheryl D. Soon

April 7, 1995

Page 5

- Additional subsidies for public transit--increases in cost attributable to the development because user fees are charged on a per-ride basis, no matter how long the ride is.

In addition, new development should bring some savings for particular government agencies. For example, water and sewer rates cover costs of service, repairs, and replacement of infrastructure. Infrastructure of a new development need not be replaced for many years, so the fees generated from the new developments help to support improvements elsewhere.

While costs cannot be pinpointed without much more information from the City agencies, it appears likely that total City and County operating costs attributable to the East Kapolei project would total much less than half the revenues generated by the project. State costs would likely be far smaller.

We would be pleased to review overall findings from this research with you when completed. Based on your letter and discussion with Brian Suzuki of your department, we herewith provide additional information on fiscal impacts related to public transit costs, refuse collection and public safety.

Public Transit

The public transit system operates at a loss, with the shortfall made up by the City and County. Currently, City funds cover an estimated 77 percent of operating costs (Barton-Aschman Associates, Inc. 1993). Some share of any new population will be new riders, leading to increased costs for the City. (However, there is strong public justification for such costs, to the extent that public transit usage means lower traffic congestion.)

Cost impacts can be estimated on the basis of (a) projected ridership and (b) estimated per-rider additional cost for suburban service.

The Mililani express bus route carried an average of 1,123 passengers on weekdays--34 passengers per trip, compared to an express bus average of 53 passengers per trip (Wilbur Smith Associates, 1994). As of 1990, the Mililani Neighborhood Board area contained 10,744 housing units. Since the great majority of new construction in the area since 1990 has been in Mililani Mauka, served by a separate express bus, the 1990 figure can be used as a basis for estimating the number of passengers from a mature subdivision: 0.1 passengers per house.

Helber Hastert
Plumbers

Ms. Cheryl D. Soon
April 7, 1995
Page 6

On Oahu, new suburban areas are commonly served by express buses that run during rush hours. Express bus service is more costly on a per-passenger basis than other types of service.

Per Passenger Net Operating Cost Difference, 1993

Express bus routes	\$2.67
Average, all routes	<u>\$0.82</u>
Difference	\$1.85 (1993 dollars--\$1.91 in 1994)

If East Kapolei residents use the public transit system about as often as Mililani residents do, then the cost of their move to the suburbs would be \$0.19 per house per work day, or \$48.15 per year if the City and County continued to support public transit use at 1993 rates. The anticipated impact (in 1994 dollars) would then be

	<u>2000</u>	<u>2010</u>	<u>Buildout</u>
Cost Impact, Public Transit	\$127,600	\$445,500	\$481,500

Planners consulting for government agencies have proposed that (a) express services be contracted to private operators, freeing up public buses for use on other routes during rush hour; and (b) a separate rate structure be established for express buses, to cover some part of the increased cost of that service (Wilbur Smith Associates, 1994). Express bus subsidies are likely to remain higher than average subsidies, because they provide an alternative to commuting long distances by automobile. Accordingly, the total cost of bus operations for East Kapolei residents could vary greatly, from about 30 percent to 100 percent of the current level of support, or \$15.00 to \$48.15 per house per year.

Refuse Collection and Disposal

In a new development, refuse can be collected using the new automated system, at far lower cost than the method mainly used in Honolulu. Automated collection involves a driver and perhaps one assistant, as opposed to four-man crews on most trucks. (Personal communication, Alex Ho, Environmental Engineer, Department of Public Works, March 1995). This saving applies to single-family homes in the project. (Typically, multi-family areas are served by private collectors.)

Disposal costs are also lowered due to the project's location in Ewa, near the H-POWER plant.

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Planners

Ms. Cheryl D. Soon

April 7, 1995

Page 7

Public Safety

As discussed in the EIS, development of the East Kapolei project would justify assigning additional Fire and Police personnel to Ewa. City experts do not find any "rule of thumb" estimate of personnel per 1,000 houses useful in this case (personal communication, Chief A. Leonardi, Honolulu Fire Department, and Brandon Stone, Management Analyst, Honolulu Police Department, March 1995). As noted earlier, the cost impact of the project would be a share of the total cost of services, needed to protect additional property only, since the City and County already assures the safety of residents.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU

0203

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111



JEREMY HARRIS
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE BS-DL

February 1, 1995

TO: BRIAN M. SUZUKI, PLANS REVISION BRANCH
PLANNING DEPARTMENT

FROM: MICHAEL S. NAKAMURA, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: EAST KAPOLEI PROJECT

C&C HONOLULU

'95 FEB 6 AM 11:07

RECEIVED

This is in response to your letter requesting for comments on a Draft Environmental Impact Statement for the East Kapolei Project.

A few small corrections are required in Section 6.8 on Police Protection. The police facility planned for Kapolei will be a regional station, not a substation. The Kapolei station will serve as the headquarters for District 8, which will encompass Kapolei, Ewa Beach, Makakilo, and the Waianae Coast.

It is true that residential growth in the region, including Kapolei East, will increase the demand for police services. It is not true, however, that the Kapolei regional station will meet that need. There is virtually no connection between the existence of police facilities and the level of police services available in an area. Officers are mobile and respond to cases in their vehicles from wherever they happen to be at that time; they do not respond from the station. Furthermore, there is no necessary connection between the construction of the Kapolei station and the provision of sufficient officers for the fast-growing Kapolei area. New beat officer positions are budgeted separately from facilities. Therefore, the Honolulu Police Department could not obtain new facilities with new positions for officers or we could obtain new positions without getting the facilities.

Mr. Brian Suzuki
Page 2
February 1, 1995

This may seem a fine point, but it is essential that sufficient new beat officer positions be provided to serve the Kapolei area. No one should be misled into thinking that the planned regional station in Kapolei will, in and of itself, provide those officers.

We have no additional comments to make at this time. Thank you for the opportunity to review this document.

MICHAEL S. NAKAMURA
Chief of Police

By *Eugene Uemura*
EUGENE UEMURA, Assistant Chief
Administrative Bureau

Helber Hastert
Planners

March 27, 1995

Assistant Chief Eugene Uemura
Administrative Bureau
Police Department
City and County of Honolulu
801 S. Beretania Street
Honolulu, Hawaii 96813



Dear Chief Uemura:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your memo to the City and County of Honolulu Planning Department dated February 1, 1995 responding to our request for comments on the above-referenced DEIS.

The EIS has been revised to indicate that the Kapolei police station is to be a regional station, headquarters for a new District 8. The EIS further reflects your point that new development is likely to bring demand for police services--officers on call--rather than facilities such as stations.

Regarding the project's demand for police services, the Honolulu Police Department currently has a total staff of about 2,500 full-time equivalent positions, of which about half are in the Patrol Division. At the current force level, this is about 2.7 members of the department for every 1,000 persons on Oahu, including both residents and visitors.

Police operations are relatively concentrated in dense urban areas such as Waikiki and involve less manpower in suburbs. Also, with active community associations, East Kapolei residents will likely form Neighborhood Watch organizations, and help to reduce the incidence of crime in their area. Hence, it is likely that the residents of the East Kapolei project will require less than two Police Department personnel per 1,000 residents, or up to 55 Police Department personnel (in all branches of the Department) after the project is fully occupied.

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Planners

Assistant Chief Eugene Uemura

March 27, 1995

Page 2

Finally, we emphasize that the East Kapolei project will not attract new people to the island. Rather, it will provide new homes in a pleasant community for Hawaii's growing population. The need for police services in the project area is not a direct impact of the project, but simply a consequence of expected population growth.

We appreciate your review of the DEIS. Your memo will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners



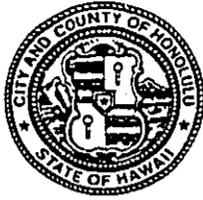
Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

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DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
MAYOR

KENNETH E. SPRAGUE
Acting DIRECTOR AND CHIEF ENGINEER

DARWIN J. HAMAMOTO
DEPUTY DIRECTOR

ENV 95-054

February 16, 1995

MEMORANDUM:

TO: CHERYL SOON, ACTING DIRECTOR
PLANNING DEPARTMENT

ATTENTION: BRIAN SUZUKI

FROM: *for* KENNETH E. SPRAGUE
ACTING DIRECTOR AND CHIEF ENGINEER *KES*

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
EAST KAPOLEI PROJECT
TAX MAP KEY: 9-1-17: 04 (POR.)

We have reviewed the subject DEIS and have the following comments:

1. The detention basin should be located on site since the proposed location will impact Ewa Village and Gentry.
2. Roadways which are to be dedicated to the City should be constructed in accordance with City standards.
3. Access improvements in accordance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) should be provided as required.
4. On Page 1-4, Section 1.3. - Address storm water quality, pollution prevention measures under the post development conditions.
5. On Page 3-9, Section 3.3. - Address City Council Resolution 94-296 objectives: Net decrease in volume and rate of runoff, improve quality of storm water to receiving waters, etc.

CHERYL SOON, ACTING DIRECTOR

Page 2

February 16, 1995

6. On Page 6-8 to 11, Section 6.4. - As indicated in the DEIS, the volume of storm water may increase substantially for both West Loch and Kalo'i Gulch basins. However, there are no provision made for reducing runoff of pollutants on-site. In addition, who will be responsible for implementing best management practices (BMPs) and maintaining the retention basins?

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at Local 4150.

cc: Schuler Homes, Inc. (Mike Angotti)
Helber Hastert & Fee (Leslie Kurisaki)

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Helber Hastert
Planners

March 31, 1995



Mr. Kenneth E. Sprague
Acting Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Sprague:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your memo to the City and County Planning Department dated February 16, 1995 responding to our request for comments on the above-referenced DEIS.

In response to your comments, the East Kapolei project will provide detention/retention for the purpose of reducing storm water volumes and improving water quality. These objectives are being sought with respect to receiving water quality (i.e., the ocean) as stated specifically in Resolution 94-296. These facilities are suggested offsite (Laulani) or onsite if a regional application does not proceed. We are not aware of any specific and mandatory requirement that all detention/retention facilities be onsite to protect receiving water.

The issues concerning the implementation of best management practices and the maintenance of the proposed offsite detention basins remains unresolved at this time.

Sections 1.3 and 3.3 of the EIS have been revised and a full discussion of the City Council's Resolution 94-296 is included in Chapter 3.

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Helber Hastert

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Mr. Kenneth E. Sprague

March 31, 1995

Page 2

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki

Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Post-It Fax Note	7671	Date	2/20/95	# of pages	2
To	Leone Kuyukoa	From	Mr. Hasegawa		
Co./Dept	General Manager	Co.	DTS		
Phone #	525-2055	Phone #	528-4119		
Fax #	525-2050	Fax #			

MEMORANDUM

TO : CHERYL SOON, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM : CHARLES O. SWANSON, DIRECTOR

SUBJECT : EAST KAPOLEI PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
TMK: 9-1-17: POR. 4

This is in response to a letter from the Office of Environmental Quality Control requesting our comments on the subject development.

Based on our review, we have the following comments:

1. A roadway master plan should be provided to our office for review during the early stages of the project. The plan should show the general alignment of the major roadways, the approximate number of dwelling units or square footage of commercial/office space for each increment, whichever is appropriate, the roadway cross-sections and a phasing plan for the development.
2. Subdivision maps for this development are presently being processed which differs from the roadway alignment shown on the project site plan. The site plan should be revised to reflect the current alignment of the proposed "North-South" Road and Kapolei Parkway.
3. The factors and methodology used to generate vehicular trips should be specified. The rates should be based on the maximum density allowable for the proposed zoning, which we understand will be classified as low density apartment. If there are areas which will be used only for single family dwellings, then the zoning should be revised to reflect this type of use.
4. The table showing the generation rates of vehicles exiting the site for single family homes during the afternoon peak period for Phase II appears incorrect.
5. Traffic impacts should be periodically assessed as this project develops. An updated traffic study should be prepared in increments that are acceptable to our department. We anticipate that an update should be prepared after occupancy of each 1000 dwelling units. This will provide our department with a means of monitoring this

development with respect to the vehicular carrying capacity of the surrounding major roadway system.

- 6. The trip distribution rates assumes the City of Kapolei will be developed and will be a primary destination point. As such, a majority of vehicular trips are being assigned to travel west of the project. The traffic study should include an assessment to address the impacts of travel characteristics prior to the full development of Kapolei City.
- 7. The type of uses anticipated for the proposed commercial sites should be specified. We would have additional concerns if the uses involve regional vehicular trips.
- 8. The study assumes that an interchange at the H-1 Freeway and the "North-South" Road will be completed by the year 2005. Because a significant amount of traffic is diverted to the interchange, this planned improvement should be closely monitored and pursued since it will have a major impact on the progress of this development.
- 9. The construction of the roadway leading to the Makakilo area should be confirmed with the developers of Makakilo. We are of the understanding that the roadway will not be built. If this is the case, the traffic study should be revised accordingly.

Our comments dated January 12, 1995 on the Environmental Impact Statement Preparation Notice (EISPN) are also applicable.

Should you have any questions, please contact Mel Hirayama of my staff at 523-4119.

CHARLES O. SWANSON

cc: Schuler Homes, Inc.
Attention: Mr. Mike Angotti

Helber Hastert & Fee, Planners
Attention: Ms. Leslie Kurisaki

(mel)

Post-It™ Fax Note	7671	Date	2/28/95	# of pages	2
		From			

Helber Hastert
Planners

April 7, 1995

Mr. Charles O. Swanson, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813



Dear Mr. Swanson:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

1. A roadway master plan will be submitted to your department during the early stages of project development.
2. You are correct that the North-South Road and Kapolei Parkway alignments depicted in Figure 2 do not reflect the currently planned alignments. Figure 2 presents the Kapolei Area Long Range Master Plan (KALRMP), dated July 1993, prepared by the Estate of James Campbell. This plan is currently being updated by the EJC to reflect recent land use changes and new roadway alignments. Until the 1993 plan is superseded, it remains the EJC's official regional land use master plan.

The preliminary concept plan for the East Kapolei project (Figure 5 in the EIS), as well as all other plans shown in the EIS reflect the correct North-South Road alignment.

3. Table 4 of the Traffic Impact Assessment Report (Appendix K of the EIS) presents the vehicle trips for the project's different uses. As noted in the TIAR, the rates were taken from the basic reference, "Trip Generation." The trip rates used are:

Housing Type	AM		PM	
	enter	exit	enter	exit
Single Family	0.20	0.55	0.63	0.37
Multi-Family	0.07	0.37	0.38	0.19

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
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Helber Hastert
Planners

Mr. Charles O. Swanson
April 7, 1995
Page 2

The applicant has requested LDA DP land use designation to permit planning flexibility in siting projects of varying residential densities throughout the project site. The EIS clearly states that the overall project objective is to construct 10,000 homes in residential densities ranging from 7 to 20 du/acre, with an overall average density of approximately 11 du/acre. The TIAR appropriately uses the 10,000 unit figure as a basis of its analysis.

4. The number of vehicle trips exiting the project during the weekday afternoon peak hour should be 1,375 not the 2,342 shown on Table 4 of the TIAR. This is a typographical error and has no effect on the analytical results or conclusions. We have corrected the error in the FEIS-appended TIAR.
5. We agree that the traffic should be monitored. We suggest that traffic studies be focused on specific intersections or roadways such as a traffic signal warrant study or intersection turning movement counts, rather than periodic project-wide updates based on dwelling units. The developer and consultants will meet with DTS traffic engineers to identify specific studies.
6. We agree with your concern that the City of Kapolei development will affect traffic distribution. However, we feel that specific studies such as noted in #5 above will be more useful to your department and the driving public than another long-range land use scenario evaluation. Again, the developer and their consultants will identify specific studies in cooperation with DTS traffic engineers.
7. The East Kapolei project's commercial uses are planned to be neighborhood-level convenience retail with no regional attraction, with the exception of the 27-acre commercial site adjacent to Farrington Highway, to be developed by the Estate of James Campbell. The EJC commercial parcel adjacent to Farrington Highway may generate regional traffic. Its associated traffic is included in the TIAR as traffic from other developments.
8. We agree that the North-South Road is a significant roadway improvement for the Ewa region. At this point, it appears the road is a product of State and City planning, and the ultimate resolution of a pioneering effort to establish a major cost sharing agreement. Further, North-South Road funding is an unresolved issue, and depends on current efforts of the State and City and major developers in finalizing the cost sharing agreement to develop regional roadways in the Ewa area. We understand that the State and City are jointly managing the planning process for the North-South Road. The developer is willing to become a participant in the effort to develop an acceptable cost sharing method for regional highway improvements.

Helber Hastert
Planners

Mr. Charles O. Swanson
April 7, 1995
Page 3

9. The Makakilo Roadway is shown on the Estate of James Campbell's long range master plan (see discussion in item #2 above). This mauka segment of the North-South Road does not change the conclusions of the TIAR. The effect of no Makakilo connection would be that Makakilo traffic would use the Makakilo Interchange and not the ramps of the North-South Road interchange, thus resulting in fewer vehicle trips on the ramps. We believe that a revision is not required, as it would not result in lower levels of service at the interchange ramps.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU

DIVISION OF PLANNING AND SERVICE CONTROL
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
~~FRANK P. FOST~~
MAYOR



MAR 21 1995

FELIX B. LIMTIAGO
~~KENNETH M. RAFFERTY~~
DIRECTOR
STEPHEN T.C. CHING
~~GEORGE M. UYEMAW~~
Acting CHIEF

WPP 95-81

March 20, 1995

Ms. Leslie Kurisaki, Project Planner
Helber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: East Kapolei Project
Draft Environmental Impact Statement (DEIS)

This letter is to confirm the telephone conversation held on March 8, 1995, between you and Bill Liu of the Division of Planning and Service Control regarding the DEIS.

Since we did not receive the DEIS submitted by your office in mid-January 1995 and subsequently received a copy on March 8, 1995, with a March 9, 1995, deadline, our review comments was not completed in time to meet the March 9, 1995, deadline.

Therefore, we would like to have the opportunity to review the final environmental impact statement when it is available.

Should you have any questions, please call Bill Liu of the Division of Planning and Service Control at 527-6871.

Very truly yours,


STEPHEN T.C. CHING
Acting Chief

Helber Hastert
Planners

April 3, 1995

Mr. Stephen T.C. Ching
Acting Chief
Department of Wastewater Management
City and County of Honolulu
Division of Planning and Service Control
650 S. King Street
Honolulu, Hawaii 96813



Dear Mr. Ching:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 20, 1995 responding to our request for comments on the above-referenced DEIS. You will be sent a copy of the final EIS for review. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
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THE ESTATE OF JAMES CAMPBELL

March 6, 1995

Mr. Brian Suzuki
Planning Department
City and County of Honolulu
650 South King Street, 8th Floor
Honolulu, Hawaii 96813

MAR - 7 1995

Re: East Kapolei Project, TMK # 9-1-17:04 (por)

Dear Mr. Suzuki:

In reviewing the Environmental Impact Statement for the East Kapolei Project, Ewa, Oahu, Hawaii, dated January 1995, we noted that in Section 2.3, existing and proposed surrounding land uses, under 2.3.2, Non-Residential Developments on page 2-8, there is no mention of Kapolei Business Park or The City of Kapolei. We believe that these projects should be described as major surrounding land uses.

We appreciate the opportunity to comment.

Sincerely,


Jan E. Burns
Manager, Special Projects

cc: Mr. Mike Angotti, Schuler Homes, Inc.
Ms. Leslie Kurisaki, Helber Hastert & Fee

blk:01036300\K10008

Helber Hastert
Planners

April 3, 1995

Ms. Jan E. Burns
Manager, Special Projects
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707



Dear Ms. Burns:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 6, 1995 responding to our request for comments on the above-referenced DEIS. As you have suggested, Sections 2.3 and 2.3.2 of the EIS have been revised to include a discussion of the Kapolei Business Park and the City of Kapolei.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



HASEKO

HASEKO (Ewa), Inc.

820 Mililani Street, Suite 810, Honolulu, Hawaii 96813-2938
Phone (808) 599-1444 Fax (808) 545-3590

MAR 13 1995

March 8, 1995

VIA HAND DELIVERY

Ms. Cheryl D. Soon
Acting Chief Planning Officer
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention: Mr. Brian Suzuki

Re: East Kapolei Project Draft EIS dated January 1995 ("DEIS")

Dear Ms Soon:

HASEKO (Ewa), Inc. is the owner and developer of the Ewa Marina project. Being at the seaward terminus of the Kaloι Gulch Watershed, the development of any of the properties mauka of us has the potential to seriously impact Ewa Marina. Therefore, we have followed the progress of all other developments in the Watershed and previously provided comments in response to the Environmental Impact Statement Preparation Notice for the East Kapolei Project. A copy of those comments are attached for your reference. In addition to those comments, we also wish to comment on the Draft EIS.

Specifically, we wish to comment on the proposal in the DEIS to construct a direct channel, a siltation basin, and an outlet to the ocean within the Ewa Marina project. First of all, the DEIS is correct in the assumption that various circumstances have caused much uncertainty as to when, or if, the marina will be built. Such circumstances include but are not limited to the recent appeal of our Conservation District Use Permit to dredge the marina entrance channel, and our pending Water Use Permit Application for the excavation of the marina being declared "contested".

Notwithstanding such obstacles, HASEKO still desires to construct the marina if feasible. We have never envisioned nor desired a massive, unsightly channel

Ms. Cheryl D. Soon
March 8, 1995
Page (2)

running through our project, and any discussion of a direct channel has only been in the context of an alternative in the event the marina cannot be built or cannot be built in time to accommodate the development schedules of the other projects in the Watershed. Therefore, while it is prudent to consider a direct channel to the ocean, any drainage plan should also discuss the marina as a possible terminus as well. At a minimum, any conceptual drainage plan should provide the flexibility to accommodate both possible scenarios and include a discussion of how drainage will be accommodated under each scenario.

While the DEIS suggests that siltation be handled off-site, it is our position that unless otherwise agreed to by all of the affected developers, each project should take care of its own silt on-site. Therefore, any drainage plan should discuss how each project will take care of siltation on-site or provide an explanation as to why such on-site silt control is not possible. We wish to clarify that contrary to the statement in the DEIS, a proposal to construct a regional siltation basin within our project has never been submitted to us for our approval. If the DEIS is referring to the Regional Drainage Concept plan which was copied to us as part of a mass distribution list (when the plan was submitted to DPW), we would object to such distribution being construed as a "proposal" as set forth in the DEIS.

Regarding silt control, we also wish to point out that because the Ewa Marina project contemplates a marina, water quality issues are of even greater importance to us than to the mauka projects. In other words, because waters entering our project site will ultimately end up in the marina and/or be released to the ocean, the 2-year/24-hour NPDES standards applicable to the mauka projects during construction may not be sufficient for us to comply with other federal and state water quality laws relating to the discharge of run-off to a marina and/or to the ocean. If any maintenance dredging or other "cleaning" of such waters is required as a result of such upland waters, any drainage plan for the Watershed must provide for the cost of such maintenance dredging or "cleaning" to be equitably allocated among the respective projects (See Condition 9 of Ewa by Gentry's Unilateral Agreement attached to Ordinance 94-57).

Finally, any drainage plan for the Watershed must also provide for the equitable allocation of the cost of any necessary drainage facilities based on the increased drainage impacts caused by the respective projects.

In summary, any drainage plan must provide flexibility in order to accommodate a variety of possible solutions. In addition, unless otherwise agreed upon by all of the affected developers, such plans should also provide for silt to be controlled on-site and for the cost of any maintenance dredging or "cleaning" of such waters to be

Ms. Cheryl D. Soon
March 8, 1995
Page (3)

shared on a pro-rata basis. And finally, any drainage plan must also provide for pro-rata cost allocation for any regional drainage facilities. We reference you to Condition 9 of HASEKO's Unilateral Agreement attached to Ordinance 93-94 and Condition 9 of Ewa By Gentry's Unilateral Agreement attached to Ordinance 94-57 for the requirements imposed by the City Council regarding regional drainage.

As you may know, there is current legislation which seeks to provide a mechanism for the City to take the lead in resolving the drainage situation in the Watershed. Whether regional drainage is addressed through the means proposed under such legislation or through the voluntary efforts of the developers, we look forward to working with all of the developers in the Watershed, including the developer of the East Kapolei Project, in developing and implementing a solution to the drainage situation.

Thank you for this opportunity to provide our comments to the Draft EIS. Please feel free to contact me if you have any questions.

Very truly yours,

HASEKO (Ewa), Inc.



Vicki Gaynor
Manager
Community & Government Affairs

VG:ca

cc: Schuler Homes, Inc.,
attention: Michael Angotti
Helber Hastert & Fee,
attention: Leslie Kurisaki
Office of Environmental Quality Control

kc\haseko\deis.doc



HASEKO

HASEKO (Ewa), Inc.

820 Mililani Street, Suite 810, Honolulu, Hawaii 96813-2938
Phone (808) 599-1444 Fax (808) 545-5590

December 23, 1994

Mr. Tom Fee
Helbert Hastert & Fee
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Re: East Kapolei Project

Dear Mr. Fee;

Thank you for this opportunity to submit comments during the scoping period for the EIS which is being prepared for Schuler Homes East Kapolei Project.

As one of the developers of Oahu's planned secondary urban center we have followed the progress of all development on the Ewa Plain. We are particularly interested in projects that lie within the Kaloi Gulch Watershed because our Ewa Marina project lies at the seaward terminus of the Watershed. Development of any of the properties mauka of us, including the East Kapolei Project, has the potential to impact Ewa Marina.

Historically, the Kaloi Gulch watershed has been comprised mostly of sugar cane fields which facilitated infiltration of surface run-off. Even during extreme storms, very little runoff ever reached the Ewa Marina property. The runoff instead ponded in inland areas and evaporated or percolated into the ground. Under these conditions, a 100-year storm event was estimated to discharge 550 cubic feet per second (cfs) of runoff onto the Ewa Marina site. The ongoing urbanization of the watershed, however, will significantly increase surface runoff. It is estimated that at full development, a 100-year storm event could send 10,000 cfs of water onto the Ewa Marina site.

Although legally HASEKO has no obligation to address the drainage needs of any development aside from Ewa Marina, we agree with the statement made in your November 9, 1994 Environmental Assessment that "Complete resolution of

Mr. Tom Fee
December 23, 1994
Page (2)

drainage within the Kaloi Gulch drainage basin will require coordination with other projects located within the drainage basin."

Both the State Land Use Commission and the City Council recognize that coordination and participation of all developers in the Kaloi Gulch Watershed is essential in the development and implementation of a regional drainage plan. As a condition to rezoning of properties within the watershed, developers have been mandated to cooperate in the development of plan for flood and silt control in the Kaloi Gulch Watershed.

The developers in the Kaloi Gulch Watershed have attempted to address the regional drainage issue by commissioning a group of professional engineers to study and address the drainage requirements and water quality concerns for the entire drainage basin. This committee issued a report in June 1993 recommending an interim drainage plan, which is appended to the Environmental Report attached to OSP's Petition for land use boundary amendment. The Environmental Report suggests that this regional drainage plan has been adopted and is being implemented. To the contrary, the engineers' report provides only an interim engineering plan which expressly does not address non-technical issues, such as responsibility for construction and maintenance of the drainage system and compensation for use of, or damages to, property. Instead, those issues were left to the developers to resolve prior to implementation of any regional drainage improvements. Despite an encouraging start at voluntary coordination efforts, virtually no progress has been made to date in resolving non-technical issues. Nor has there been any agreement as to a permanent drainage solution for the region.

HASEKO has consistently maintained that Ewa Marina cannot by itself take care of all the drainage problems in the Kaloi Gulch Watershed. To be effective, flood control plans must involve the cooperation, participation and contribution of all the developers in the Kaloi Gulch Watershed and must address such issues as detention and retention of stormwaters flows, diversion of these stormwaters to specified areas to minimize property damage, and siltation and removal of pollutants to prevent degradation of coastal waters. There are engineering solutions to these drainage concerns but resolution of this issue cannot be achieved until all affected developers agree on both the appropriate drainage infrastructure for the entire Kaloi Gulch Watershed area, and the equitable allocation of construction and maintenance costs for such infrastructure.

We encourage a discussion of these issues in the Environmental Impact Statement that is being prepared, as well as a reiteration of the need for coordination with other projects in the Kaloi Gulch Watershed. HASEKO looks forward to working with

YYTEKAPOLE,

Mr. Tom Fee
December 23, 1994
Page (3)

the developers of the East Kapolei Project in the development and implementation of a regional drainage solution.

Please feel free to contact me if you have any questions.

Very truly yours,

HASEKO (Ewa), Inc.



Vicki Gaynor
Manager
Community & Government Affairs

VG:kk
cc: Shuler Homes

YYREKAPOLEI

Helber Hastert
Planners

March 31, 1995

Ms. Vicki Gaynor, Manager
Community and Government Affairs
Haseko (Ewa), Inc.
820 Mililani Street, Suite 810
Honolulu, Hawaii 96813-2938



Dear Ms. Gaynor:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 8, 1995 responding to our request for comments on the above-referenced DEIS, as well as your earlier comments on the Preparation Notice.

As discussed in the DEIS, the Kaloi Gulch drainage proposal is still being reviewed by various parties. Although the drainage proposal discusses the construction of a direct channel through the Ewa Marina property (east of the marina basin), the DEIS states that "this will not preclude connection to the marina, should the adverse impacts, maintenance and other issues be resolved and the marina is built."

The proposal to utilize the Laulani site for detention/retention is being reviewed by the City and County. If this alternative is not adopted, onsite detention/retention facilities meeting City and County requirements will be provided. We are not aware of any specific and mandatory requirement requiring that all detention/retention facilities be provided onsite to protect receiving water.

You note that any drainage plan for the watershed must also provide for the equitable allocation of the cost of any necessary drainage facilities based on the increased drainage impacts caused by the respective projects. Schuler Homes, Inc. fully supports the creation of a regional drainage district in the area. We believe that a regional drainage authority responsible for the operation and maintenance of regional drainage improvements provides an appropriate vehicle for the equitable allocation of drainage-related costs.

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Helber Hastert

Planners

Ms. Vicki Gaynor

March 21, 1995

Page 2

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBER HASTERT & FEE, Planners

Leslie Kurisaki

Leslie Kurisaki

Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.



March 9, 1995

RECEIVED
MAR 13 1995

Via Facsimile and U.S. Mail

Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Attention: Ms. Leslie Kurisaki

Re: ***East Kapolei Project (Schuler Homes, Inc.): Draft Environmental Impact Statement dated January 1995; Comments of Gentry Homes, Ltd.***

Dear Ms. Kurisaki:

As I indicated in my letter of March 2, 1995, Gentry Homes, Ltd. has been reviewing the draft EIS. While we continue to evaluate the impacts of the East Kapolei Project on our development, we have the following comments which should be addressed:

1. ***Page 1-5 (Infrastructure):*** The statement that the [Schuler] project engineers will coordinate with designers of Ewa By Gentry-East "to ensure that their [Gentry's] regional drainage system will accommodate the East Kapolei Project" is unclear. We have received no communication from Schuler Homes, Inc.'s project engineers other than transmittals of the preliminary reports upon which we commented March 2. Effective coordination will require more significant communication between our respective entities including discussion and agreement upon cost sharing for any master-planned drainage improvements upon which Schuler Homes, Inc. bases its development plan.
2. ***Page 1-7, para. 1.5 (North-South Road; Drainage):*** We note that Schuler Homes expects to contribute its fair share to fund construction of the North/South Road, but does not mention contribution of its fair share to fund construction of drainage improvements within the Kalo Gulch drainage basin or the West Loch drainage basin. Those matters should be addressed.

3. **Page 2-7 (Ewa By Gentry):** Your description of Ewa By Gentry mentions a neighborhood "community" center. We believe that you meant neighborhood *commercial* center.
4. **Page 2-9 (Other Proposed Facilities):** In discussion of other proposed facilities, Schuler Homes does not indicate an expectation to pay its fair share of the cost of the regional highway system. There is a highway plan which was formulated by the Ewa region developers and in coordination with the State Department of Transportation. Participation in the cost sharing and implementation of the regional transportation master plan on a fair share basis should be addressed.
5. **Page 2-11, Table 1 (Proposed Land Uses):** This table shows no on-site detention/retention acreage. Gentry objects to this omission because it is violative of applicable standards and harmful to downstream landowners.
6. **Page 4-6, para. 4.4 (Flooding):** The statement that the East Kapolei Project drainage system "will not adversely affect downstream flood hazards" is objectionable. As preliminarily proposed, the impact on downstream landowners of siltation, sediment and flooding could be substantial.
7. **Page 6-3, para. 6.2 (Water Supply):** We are unable fully to evaluate the information regarding proposed water supply for the project at this time. However, we are concerned that the East Kapolei Project not interfere with the Ewa Plain Water Development Corporation's source, transmission and storage plans. Our consultants will be reviewing the Water Master Plan, Appendix J. Separate comments may be provided upon conclusion of that review.
8. **Pages 6-8 and 6-9:** Existing conditions for the West Loch and Kaloi drainage basins are inaccurately described. We have asked our consultants to examine the assertions of Gray, Hong, Bills and Associates regarding both the Kaloi and the West Loch tributaries, and compare those to other current information. Communications should then occur between project engineers so that the discrepancies can be resolved.
9. **Pages 6-10 and 6-11:** Indications that there are ongoing consultations and discussions with adjacent developers concerning these drainage improvements proposed by Schuler Homes are misleading. Gentry

Helber Hastert & Fee, Planners
March 9, 1995
Page Three

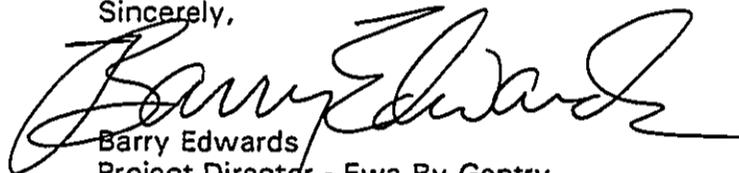
Homes has not been contacted for consultation or discussion on the issues presented in the preliminary studies upon which our March 2 comments were based.

10. **Page 10-3:** We are concerned that Gentry Homes was not among the consulted parties in the DEIS preparation process and do not understand Gentry's omission from the list of those that will be impacted by the East Kapolei Project.

We reserve the right to comment further as we learn more about the East Kapolei Project and its impacts. It is requested that we be kept advised of all developments which have the potential to impact Ewa By Gentry or its offsite infrastructure. We also request a copy of the final EIS when it is completed.

Thank you for this opportunity to comment.

Sincerely,



Barry Edwards
Project Director - Ewa By Gentry
Gentry Homes, Ltd.

cc: -Mr. Michael Angotti
Director of Land Acquisitions
Schuler Homes, Inc.

-Mr. Harvey L. Goth
Senior Vice President
Schuler Homes, Inc.

-Ms. Cheryl Soon
Planning Director
Planning Department
City and County of Honolulu

Helber Hastert
Planners

March 31, 1995

Mr. Barry Edwards
Project Director-Ewa by Gentry
Gentry Homes, Ltd.
P.O. Box 295
Honolulu, Hawaii 96809



Dear Mr. Edwards:

**East Kapolei Project, Ewa, Oahu, Hawaii
Draft Environmental Impact Statement (DEIS)**

Thank you for your letter to the City and County of Honolulu Planning Department dated March 9, 1995 responding to our request for comments on the above-referenced DEIS. We have reviewed your comments and offer the following responses:

1. **Infrastructure:** The referenced section of the EIS has been revised to provide more clarity. Regional coordination of infrastructure development and cost sharing (i.e., for water, wastewater, roadways, drainage) is being conducted through regional studies. The developer is coordinating its East Kapolei improvements through the parties spearheading these regional efforts.
2. **North-South Road; Drainage:** Schuler Homes fully supports the creation of a regional drainage authority to allocate costs of operation and maintenance of regional drainage improvements.
3. **Ewa by Gentry:** Text revised accordingly.
4. **Other Proposed Facilities:** Schuler Homes will participate with other major developers in the area on the preparation and implementation of the Ewa Region transportation master plan. The developer has been coordinating its involvement through the Estate of James Campbell which is spearheading the master plan effort.
5. **You are correct;** the overall land use table (Table 1) does not show onsite detention/retention acreage. Should the proposals for offsite detention/retention be deemed unacceptable, onsite facilities meeting City and County requirements will be provided. The required area would then come out of the residential acreage.

Helber Hastert & Fee
Grosvenor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Helber Hastert
Planners

Mr. Barry Edwards
March 21, 1995
Page 2

6. Text revised.
7. Water Supply: Comment acknowledged. Water source for the project remains an unresolved issue at this time.
8. Pages 6-8 and 6-9: Comment acknowledged. The EIS text now includes an expanded discussion of proposed drainage improvements.
9. Pages 6-10 and 6-11: As stated previously, the developer is coordinating its proposed infrastructure improvements through regional efforts by area landowners.
10. Page 10-3: Gentry Homes will be kept advised of all developments which have the potential to impact Ewa by Gentry or its offsite infrastructure.

We appreciate your review of the DEIS. Your letter will be reproduced in the Final EIS.

Sincerely,

HELBERT HASTERT & FEE, Planners



Leslie Kurisaki
Project Planner

cc: Ms. Cheryl Soon, Planning Department
Mr. Mike Angotti, Schuler Homes, Inc.

Appendix A

Consent Letter from Russell Alger,
Director of Hawaii Asset Management
The Estate of James Campbell, October 21, 1994

Letter from Keith Ahue, Chairman,
Board of Land and Natural Resources,
State of Hawaii, October 19, 1994

THE ESTATE OF JAMES CAMPBELL

October 21, 1994

Mr. James Schuler
Schuler Homes, Inc.
828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813

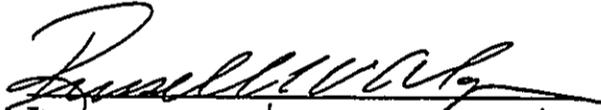
Re: East Kapolei

Dear Mr. Schuler:

The Estate of James Campbell hereby authorizes Schuler Homes, Inc. to file a Development Plan Application for the 1995 Development Plan Land Use Amendment Review with the City and County of Honolulu for 544 acres of land at Honouliuli, Ewa, Oahu, being a portion of Lot 8862-A, as shown on Map 709 of Land Court Application 1069, Oahu Tax Map Key No. 9-1-17-4.

Sincerely,

THE ESTATE OF JAMES CAMPBELL,
DECEASED

By 
Its Director, Hawaii Asset Management

blk:01002200\K10345.1

JOHN WAIHEE
Governor of Hawaii



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. Box 621
Honolulu, Hawaii 96809

OCT 19 1994

KEITH W. AHUE, Chairperson
Board of Land and Natural Resources

Deputy Directors:
JOHN P. KEPPELER, II
DONA L. HANAIKE

Aquaculture Development
Aquatic Resources
Boating and Ocean Recreation
Bureau of Conveyances
Conservation and Environmental Affairs
Conservation and Resources Enforcement
Forestry and Wildlife
Historic Preservation
Land Management
State Parks
Water and Land Development

Mr. Robin Foster
Chief Planning Officer
Planning Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

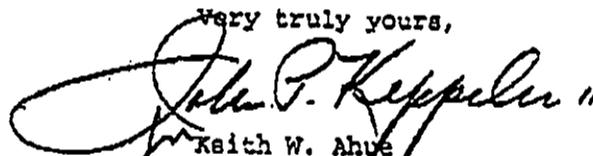
Dear Mr. Foster:

Subject: Development Plan Land Use Amendment Review at Kapolei, Ewa, Oahu

The Department of Land and Natural Resources hereby authorizes Schuler Homes, Inc. to file a development plan application for the 1995 Development Plan Land Use Amendment Review on 500 acres of land at Honouliuli, Ewa, Oahu (TMK 9-1-17:04 Portion). The 500 acres is what the State of Hawaii is exchanging with the George Galbraith Trust for approximately 2,200 acres north of Wahiawa.

Should you have any questions regarding this matter, please feel free to contact Mr. Dean Uchida at 587-0156.

Very truly yours,


John P. Keppeler II
for Keith W. Ahue

cc: Office of State Planning

Appendix B

Letter from Donna B. Goth, Director of Hawaii Development,
The Estate of James Campbell, October 6, 1994

THE ESTATE OF JAMES CAMPBELL

October 6, 1994

Mr. Michael G. Angotti
Director of Land Sales
Schuler Homes, Inc.
828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813

Dear Mike:

Re: Schuler Ewa Water Master Plan

I am writing this letter to explain Campbell Estate's position regarding the identification of the Ewa Shaft (EP 15 and 16) as the water source for the proposed Schuler Homes project in Ewa. It is important that a copy of this letter be included with the submission of your Water Master Plan to the Land Use Commission and any other governmental agency involved with your project.

As we have discussed, the Estate intends to reserve all water rights with respect to the lands that Schuler intends to acquire from the Estate for this project. These rights include the ownership and operation of the Ewa Shaft which will be a water source for the Estate's activities including on-going agricultural operations upon expiration of the Oahu Sugar Company Ltd. Lease on June 30, 1995.

We have received correspondence from the Board of Water Supply indicating they are interested in owning the Ewa Shaft. Our response to them is "...that the loss of the Ewa Shaft or the water therefrom would cause significant and possible irreparable damage to the Estate. Furthermore, the Estate's loss of use of the Ewa Shaft through eminent domain or regulation, or both, would entitle the Estate to substantial compensation, not only for such loss, but also for loss of value to the Estate's surrounding lands."

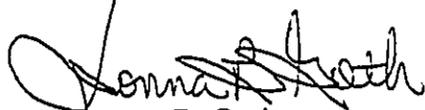
To date, the Estate has received no proposal from the Board of Water Supply which addresses any terms and conditions which would mitigate the Estate's concerns.

We would prefer that you delete any references to the Ewa Shaft as a potential water source. Inasmuch as you desire to provide as much detail as possible in your entitlement applications, your cooperation by including this explanation with your Water Master Plan submissions will help the Estate continue to defend its rights.

Mr. Michael G. Angotti
October 6, 1994
Page 2

I am available to respond to any questions.

Very truly yours,



Donna B. Goth
Director, Hawaii Development

cc: Gray, Hong, Bills & Associates
David B. Bills

Estate of James Campbell
Jan Burns
George Hiu

Appendix C

Memorandum from Don Hibbard, Administrator
State Historic Preservation Division,
Department of Land and Natural Resources
dated September 22, 1994

JOHN WAIHEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

September 22, 1994

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 8TH FLOOR
HONOLULU, HAWAII 96813

KEITH AHLU, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCE

DEPUTIES

JOHN P. KEPPELER II
DONA L. HANAKE

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

ENVIRONMENTAL AFFAIRS
CONSERVATION AND

RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION

LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Joseph Kennedy
Archaeological Consultants of Hawaii
59-624 Pupukea Rd.
Haleiwa, Hawaii 96712

LOG NO: 12769 ✓
DOC NO: 9409TD21

Dear Mr. Kennedy:

**SUBJECT: Historic Preservation Review--Preliminary Concept Plan for East
Kapolei Project (Schuler Homes, Inc.)
Honouliuli, 'Ewa, O'ahu
TMK: 9-1-17: por. 4**

Thank you for the opportunity to review this proposed project. A review of our records shows that there are no known historic sites at the project location shown on your map. These lands were commercially cultivated with sugar cane for many years and it is unlikely that significant historic sites will be found on them. We believe that this project will have "no effect" on historic sites.

If you have any questions please call Tom Dye at 587-0014.

Sincerely,

A handwritten signature in black ink, appearing to read "Don Hibbard".

DON HIBBARD, Administrator
State Historic Preservation Division

TD:jk

Appendix D

East Kapolei Project Market Assessment
Gail W. Atwater AICP, October 1994

East Kapolei Project
Market Assessment

Gail W. Atwater, AICP
Planning Consultant
October 1994

East Kapolei Project
MARKET ASSESSMENT

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Section I

INTRODUCTION

OVERVIEW

Schuler Homes, Inc. proposes a residential development with minimal support retail uses on approximately 1022 acres of land in Ewa, Oahu. The subject property is divided into two contiguous parcels: a joint venture with Galbraith Trust (approximately 500 acres) in the southern portion and a parcel to be purchased from The Estate of James Campbell in the northern portion (approximately 522 acres).

Gail W. Atwater, AICP was contracted by Schuler Homes, Inc., to assess the market feasibility of residential and neighborhood retail developments on the property generally known as the East Kapolei Project. This report presents the results of that analysis.

PURPOSE AND OBJECTIVES

The purpose of the Market Assessment was to evaluate the overall market potential of the subject property. This has been accomplished through an estimate of the absorption of the proposed land uses and an assessment of the property's relationship to other Oahu master planned communities. It should be noted that this is a market analysis and not an assessment of financial feasibility.

The specific objectives of the evaluation were to:

- **Conduct a Site Review and Analyze Existing Conditions.** This included evaluating the site relative to its development potential and analyzing general economic trends and indicators supporting residential and support (neighborhood) commercial development on the subject parcel.

- **Analyze Supply and Demand Conditions for Residential Development.** The supply analysis included evaluating planned and proposed projects. Demand analyses included reviewing relevant trends, analyzing the oversupply or shortfall of supply versus demand and describing the products and target markets for the subject property.
- **Estimate Absorption and Pricing for Residential Development.** This analysis included testing the developer's assumptions of absorption and pricing against existing and estimated market conditions. Prices are stated in 1994 dollars.
- **Evaluate Market Potential for Neighborhood Commercial Development on the Subject Property.** This analysis was based on general rules-of-thumb and an inventory of existing and planned support commercial in the project vicinity.

METHODOLOGY

To accomplish the above objectives, the scope of work included, but was not limited to:

- Discussions with Schuler Homes, Inc., Hawaiian Trust Company, Ltd. and other consultants on the Environmental Impact Statement analytical team regarding the project and the property.
- Several inspections and evaluations of the site and its surrounding area in order to determine its physical attributes and relationship to other properties in the market. This evaluation did not include any engineering or environmental considerations, but encompassed an evaluation of the site's accessibility, visibility, proximity to towns and other developments, physical layout and appearance and their potential effect on the marketability of the property.

- Analyses of economic and demographic data pertaining to the market area and an evaluation of the present economic climate. These analyses were used in the estimation of future growth potential in the residential and support commercial markets.
- Analysis of housing supply based on published data and interviews with real estate agents and developers of residential projects which could be potentially competitive with the subject property. Additions to supply were based on public and private sources of information.
- Calculation of demand with guidance from the City and County of Honolulu General Plan and Land Use Model, in addition to the State of Hawaii's Series M-K population projections and other demographic documents prepared by public and private sources.
- Estimations of the subject property's performance, using capture rates and taking into consideration its attributes and disadvantages relative to competing projects and the historic performance of similar developments.

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EXECUTIVE SUMMARY

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Section II

EXECUTIVE SUMMARY

**Property
Location**

One of the last major agricultural parcels remaining unplanned in Oahu's developing "second urban center" in Ewa, bordered by Farrington Highway to the north, the planned North South Road to the east, agricultural land to the west and the Ewa Villages golf course to the south. Site is approximately equidistant (2 to 2 1/2 miles) to Makakilo and Fort Weaver Road freeway interchanges.

Size

Approximately 1,022 acres, divided into two contiguous parcels: a joint venture with Galbraith Trust (approximately 500 acres) in the southern portion and a parcel to be purchased from The Estate of James Campbell in the northern portion (522 acres).

**Physical
Attributes**

Relatively flat terrain on former coral plain which historically has been planted in sugarcane.

Limited access until construction of North South Road. Currently accessible through Farrington Highway which in turn provides access to H-1 via interchanges at Makakilo Drive to the west and Fort Weaver Road to the east.

Sunny, leeward-type climate

**Market Study
Area**

Master Planned Communities within the Ewa Development Plan Area and along the western H-1 corridor including the communities of Waikele and Royal Kunia.

Economic

Moderate near term and strong long term growth trends in both commercial and residential indicators, with demonstrated pent-up residential and retail demand.

**Government
Policy**

State and County governments have established population allocation policies and invested capital in support of developing a second urban center and affordable housing in Ewa.

Residential

Supply/Demand Shortfall, 1994 - 2010, Market Study Area	8,509 - 13,322 units
Demand for Additional Units, 1994 - 2010, Market Study Area (includes Ewa DP Area)	36,070 - 40,883 units
Demand for Additional Units, 1994-2010, Ewa DP Area Portion Only	28,856 - 32,706
Planned Units East Kapolei Project	2,590 Single Family - Market Priced 1,810 Townhomes - Market Priced 2,400 Multifamily - Low Density Units (DU) - Market 200 Multifamily - Medium DU - Market 2,000 Multifamily - Medium DU - Affordable (up to 80% of median household income) 1,000 Multifamily - Medium DU - Affordable (81-120% of median) 10,000 Total
Year Sales Begin	1997
Average Annual Absorption	650 - 700 units
Capture Rate of Market Study Area Residential Demand to 2010	25 to 30 percent
Capture Rate of Oahu Residential Demand to 2010	12 to 14 percent

Retail

Potential Need for New Support Retail Space by 2010 Up to 218,000 square feet within the deed restrictions of the subject property. Overall excess demand within subject's retail trade area is approximately 468,300 square feet by 2010.

Target Tenants Supermarkets, drug stores, restaurants, surf and other small apparel shops, bars, photocopiers, dry cleaners.

Additional Uses Recreation: Several community parks.

Section III
SITE DESCRIPTION

Section III

SITE DESCRIPTION

INTRODUCTION

Oahu. The subject property is located on the island of Oahu, whose name means "the gathering place" in Hawaiian. True to its appellation, the island serves as Hawaii's governmental, commercial and cultural center. Although the capital island possesses only ten percent of the State's land area, three-quarters of its population lives and works there.

Ewa. The subject property is located in the Ewa region of western Oahu. This region historically comprised the Hawaiian ahupuaa (mountain-to-sea division of land) known as Honouliuli. Much of this area has long been under the control of one major landowner, The Estate of James Campbell. According to government policy Ewa is destined to become the island's second urban center by early in the next century, with its focal point being the "City of Kapolei."

Organization of this Section. This section first discusses the project site in terms of location, boundaries, access, visibility and surrounding uses. This is followed by a presentation of regional context and plans for the second city.

SITE LOCATION

The East Kapolei Project site is located in the eastern area of Ewa. The property is currently in agricultural use which is being phased out of sugarcane production. It is one of the last major unplanned agricultural parcels south of H-1 freeway.

Schuler Homes, Inc., partly through a joint venture with Galbraith Trust, is proposing residential development on approximately 1022 acres of land at the project site. Of the 1022 acres:

- 500 acres are owned by the State of Hawaii and are planned as Phase I of the proposed project. These lands are proposed for exchange with Galbraith Trust land holdings

which lay north of the town of Wahiawa in Central Oahu. Under the terms of this agreement, the Ewa acreage would be urbanized in exchange for the opportunity to retain the agricultural use of Galbraith's Wahiawa lands.

- An additional 522 acres, contiguous with the state's parcel, will be purchased from The Estate of James Campbell by Schuler Homes, Inc. These lands also are proposed for residential use as Phase II of the proposed project.

The project site and its relationship to the island of Oahu are shown on the following page in Exhibit III-1, *East Kapolei Project - Location Map*.

SITE BOUNDARIES AND ACCESS

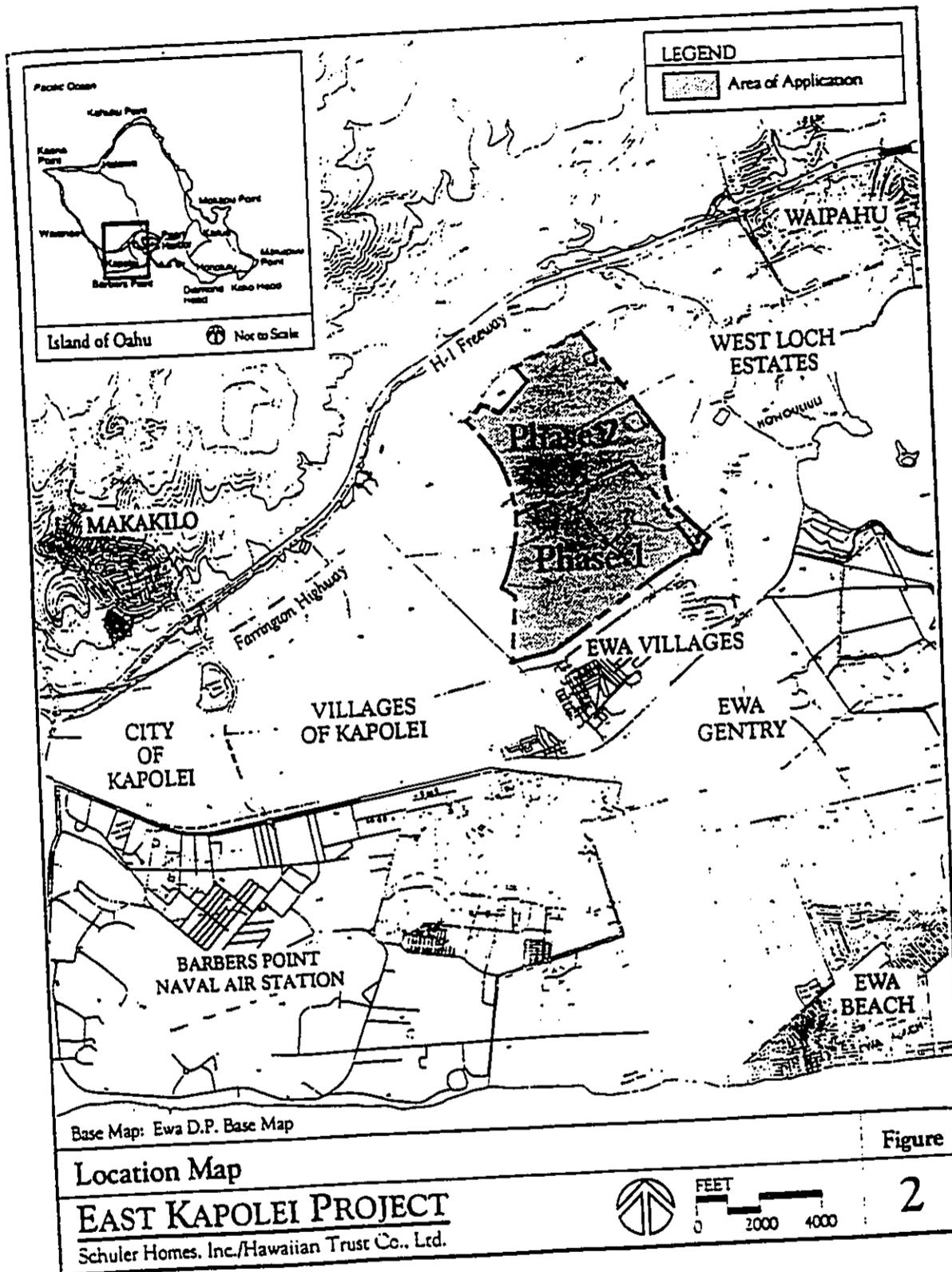
Boundaries

The subject property lies south of Farrington Highway between Makakilo Drive and Fort Weaver Road. The irregularly-shaped parcel is bounded by Farrington Highway to the north, the planned North South Road to the west, remnants of a cane haul road known as Pipeline Road and agricultural land to the east and the golf course associated with the Ewa Villages residential project to the south. The site is approximately equidistant (two to two and a half miles) to the H-1 freeway interchanges at Makakilo and Fort Weaver Road.

Access to the Site

The subject site is adequately served by existing roads, at least for Phase I which is planned using the southernmost 500 acres. Future improvements will make access excellent. These improvements include the construction of the North South Road, completion of Kapolei Parkway and widening of Farrington Highway. Following is a review of the major points of access to the project site, both existing and planned.

Exhibit III-1
East Kapolei Project - Location Map



H-1 Freeway. Oahu's first and primary interstate highway is located to the north of the parcel, providing a vital link to Central Oahu and the Primary Urban Center. There are two existing freeway interchanges in the subject property's vicinity: Makakilo Drive to the west and Fort Weaver Road to the east. Additionally an interchange is planned along the future North South Road.

Farrington Highway. This is a major arterial which will provide the primary access route for the subject development until construction of the North South Road. In the project vicinity, Farrington Highway is currently a two-lane, county-maintained highway that may be widened as an improvement associated with this project. After H-1, this road serves as the area's primary access to Waipahu and the Primary Urban Center. Farrington Highway also is the major local connection between the City of Kapolei and development in the West Loch Estates and Waipahu areas.

North South Road. This road is planned as the major feeder connecting H-1 with Farrington Highway in the north and a future section of the Kapolei Parkway in the south. The alignment of this road will approximate the western boundary of the subject parcel, as well as the eastern boundary of the planned campus of the University of Hawaii at West Oahu. It is expected that this road will facilitate regional transportation flow by alleviating traffic on Fort Weaver Road and Makakilo Drive.

Kapolei Parkway. Kapolei Parkway is partially constructed at this time. It is planned to provide a major connection between eastern Ewa and the City of Kapolei and the resort-oriented communities of Ewa Marina and Ko Olina.

Project Access Roads. Two access roads intersecting the North South Road are planned within the subject site.

PROPERTY VISIBILITY

The subject property is visible but not easily defined when traveling southbound on H-1 and Farrington Highway. When traveling northbound, the project area is visible from the Ewa Villages golf course and residential areas.

The major view planes are toward downtown Honolulu and Diamond Head to the southeast and toward the Waianae Mountains to the north of the parcel. Due to the relatively flat topography, view planes of Honolulu will be obstructed by multi-story development for all parcels except those along the property's fringes. Views of the mountains will be obstructed to a much lesser degree.

SURROUNDING USES

Ewa Villages

To the south of the parcel are the existing clustered communities known as Ewa Villages. This residential area is separated from the subject parcel by a golf course being developed by the City and County of Honolulu, which plans to conduct a rehabilitation program for the existing "historic" plantation villages of Ewa. This master plan for Ewa Villages also includes development of additional single family residential units. The first new home models are nearing completion. For more information on Ewa Villages see Appendix A, *Competitive Product*.

Other Uses

Aside from Ewa Villages, the lands surrounding the subject property all are currently in agricultural use. The most significant urbanization plan for these lands is the location of the University of Hawaii at West Oahu campus on the adjacent parcel to the west. This Site Description section concludes with

a discussion of specific plans for this campus and its possible impact on the subject property.

REGIONAL CONTEXT

The Second City at Kapolei

The development pattern of Oahu has always relied on employment and government services centered within the urban core of Honolulu. This pattern worked well until developable land dwindled in the central city and prices for commercial, industrial and residential land skyrocketed. Also, due to the building of bedroom communities throughout the island, traffic problems mounted between the outlying homes and the job center in Honolulu.

The location of a second city at Kapolei in the center of Ewa was conceived through a collaboration between The Estate of James Campbell, the State of Hawaii and the City and County of Honolulu. The Kapolei area includes land from Pearl Harbor's West Loch to Kahe Point and from the lower slopes of the Waianae Mountains to the West Oahu beaches and Barbers Point.

The main objectives of the building second city are:

*To direct commerce, jobs and industry to West Oahu;
and*

*To direct population growth to "a vital new urban center
where people can live, work and play."*

(Source: "Kapolei: A New City Comes to Life," Hawaii Investor, 1993)

A regional plan for the Ewa area, entitled the Kapolei Area Long Range Master Plan, has been developed The Estate of James Campbell. However, earnest planning for the area can be traced back almost forty years:

Employment Base. Development of an employment base in Ewa dates back to 1955 when planners advised The Estate of James Campbell to develop an industrial complex on the western tip of Oahu, utilize prime beachfront areas as resort destinations and encourage the siting of a new university within Ewa.

- The industrial concept evolved into the James Campbell Industrial Park which opened in 1959 and has been a major center for heavy industry on the island ever since.
- Ewa Marina and Ko Olina emerged as the planned resort developments.
- The location of a major campus of the University of Hawaii in Ewa has only recently begun to appear likely.

Second Urban Center at Ewa. The origins of the full "second city" concept date back to 1974 when planner Donald Wolbrink authored the comprehensive and prescient study entitled "Honouliuli: A Self-Contained City at Ewa." Current plans have much in common with this twenty year old study.

There are several critical differences between the second city and previous major developments on Oahu. First, there is a major regional plan which integrates the various land uses into an integrated whole, rather like the pieces of a mosaic creating a complete picture. This is not to be the building of one community, but an integration of many. Second, as the objectives above indicate, the second urban center is to be not only a residential development but also offer a range of employment opportunities. This employment-center orientation sets Kapolei apart from past developments which primarily provided housing and limited commercial facilities.

The Evolution of Ewa

Ewa spent the first half of this century primarily as a sugar plantation bordered by the sea, Pearl Harbor, the rural community of Waianae and uninhabited hills and mountains.

In the late 1940s the U.S. military took over use of the site which is now the Naval Air Station at Barbers Point.

By the 1960s, James Campbell Industrial Park had been constructed and residential development had begun on the foothills of Makakilo led by Finance Realty Company, Ltd. The community of Ewa Beach was settled.

By the late 1970s large-scale residential development began with Gentry's Ewa development. A regional plan for Ewa was taking shape.

In 1989 the final concept was approved by the Honolulu City Council when it adopted the General Plan which recognizes Kapolei as the island's secondary urban center.

During the early 1990s the second city's master planned communities began construction and the commercial center started taking shape with the opening of the Kapolei Shopping Center and the office buildings of James Campbell Square, further infrastructure development and several major new office and retail complexes.

Government Support for the Second City

City and County of Honolulu. The General Plan is "a comprehensive statement of objectives and policies which sets forth the long-range aspirations of Oahu's residents" and the strategies and actions to achieve them (General Plan, 1992). This Plan specifically states the intention to: "*Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei*" (Objective G, Policy 1).

County actions are implementing this policy already: the Department of Housing and Community Development is sponsoring the project to redevelop and augment the community of Ewa Villages. In addition, planning is underway for a major County facility at the Kapolei Civic Center to provide regional municipal services and increase the region's employment base. This includes construction of Kapolei Fire Station, which is estimated to be operational in 1995. The Kapolei Police Station, located at the entrance to the City of Kapolei, is in the design stage.

State of Hawaii. The State of Hawaii also has demonstrated its support for urbanization of Ewa/Kapolei by a variety of actions, including:

- Joint ventures with various developers and landowners to provide the 4,200 residential housing units at the Villages of Kapolei master planned community;
- Purchase of a "State Land Bank" in the Kapolei Area for urbanization and other public purpose land uses, which contains 500 acres or about half of the subject property;
- Development of a regional state civic center to provide employment and regional services to the new second city; and
- Designation of Ewa as the site for construction of the University of Hawaii at West Oahu on a parcel of land adjacent to the subject property.

U.S. Government. The federal government will figure indirectly in the development of the second city at Kapolei through the land uses within its major holding in the area, the Naval Air Station at Barbers Point. This military base has defined land use in a significant portion of Ewa since World War II, but is slated for closure under the national Base Realignment and Closure Act. Plans for reuse are underway and are likely to play a significant role in shaping land use patterns within the southern Ewa region.

The University of Hawaii at West Oahu

Location Adjacent to Subject Parcel. The State of Hawaii has expressed its intention to locate a second major Oahu campus of the University of Hawaii in Ewa. This will be a major force in the evolution of the subject development, as the designated campus site is directly across the planned North South Road from the proposed East Kapolei Project.

Long Range Plans. As discussed above, the concept of locating a major university campus in the Ewa region had its roots in the 1950s. Not until the 1990s, however, has this scenario truly begun to appear likely. The Estate of James Campbell (EJC) has provided lands for a campus to the State of Hawaii. This transfer of title contains conditions, however. The University of Hawaii at West Oahu must enroll 2,750 students at the new campus by the year 2006 or land ownership will revert to The Estate of James Campbell. EJC staff interviewed for this analysis quoted a City and County planning study which estimated 6,020 students at the campus by the year 2020.

Discussions with policy executives within the University of Hawaii administration indicated the following tentative timeline for development of the campus at Ewa:

Five to Ten Years Out (circa 1999-2004) - the campus is planned as a four-year baccalaureate (undergraduate) liberal arts college with limited masters-level study. Programs will duplicate those currently offered at the University of Hawaii at Manoa. Students are expected to be net additions to the system, taking the growth burden off the already at-capacity, 23,000 student Manoa campus.

Ten to Fifty Years Out (circa 2005-2045) - the campus could qualify as a "Carnegie Comprehensive Campus" providing full bachelors and masters level programs.

More than Fifty Years Out (after 2045) - the campus has the potential to evolve into a doctorate-granting university.

Expected Impacts on Development of the Subject Parcel. The location of the University of Hawaii at West Oahu campus adjacent to the proposed development is likely to have a number of ramifications.

First, the university is likely to result in increased demand for housing on the subject property. A portion of students, faculty and, to a lesser degree, university staff will likely favor living close to campus. Most students favor off-campus housing that facilitates walking or bicycle transportation within a two-mile radius of campus; the subject parcel is well within that radius.

Second, the university is likely to generate retail demand. In general, the second city will benefit from meeting the localized shopping needs of a university campus. In particular, the subject parcel's support commercial will be well positioned to benefit from some university-generated retail demand.

SITE DESCRIPTION CONCLUSION

The project site is ideally situated to take advantage of the growth expected to occur in Oahu's second urban center. Access is currently adequate with prospects for becoming excellent with planned improvements. Surrounding uses are primarily agricultural, with the exception of the Ewa Villages to the south. The development of the second city at Kapolei and the location of the University of Hawaii at West Oahu will both contribute to activity and demand within the subject property.

Section IV
AREA REVIEW

Section IV

AREA REVIEW

INTRODUCTION

The Area Review presents an analysis of major economic trends both in the State of Hawaii and the island of Oahu. Three sets of key indicators offer economic support for the proposed residential and support commercial development on the subject property:

- General Trends
- Residential Indicators
- Commercial Indicators

GENERAL TRENDS

Hawaii versus Mainland U.S. Economic Trends

Hawaii Business Cycles. Hawaii's economic growth over the past decades indicates the strength and resiliency needed for continued expansion of both housing and commercial markets. Over time, economic indicators such as employment, visitor expenditures and inflation have consistently exhibited more vigor than the Mainland United States.

An analysis of long term trends (50 years) appears to indicate an approximately nine-year business cycle in the State. In the 1980s Hawaii's economic growth rate far outpaced the rest of the nation. Hawaii economists argued it was not sustainable over the long run. Indeed it was not. The peak of this strong, some would say over-heated, development cycle appears to have occurred in 1990.

Recent Recessionary Trends. Historically, Hawaii's economic declines have been comparatively modest compared to those experienced on the Mainland and have lagged by twelve to eighteen months. According to the economists at Bank of Hawaii, the state's recent recession had three phases:

- (1) The early phase saw high inflation eroding income but continued growth in production and employment despite the Persian Gulf War.
- (2) The middle phase occurred from fall of 1991 to fall of 1992. During this time, an export-led contraction was caused by westbound tourism's decline [tourism is an "export" in economic terms]. This combined with a construction downturn which slowed employment growth and created the true "recession" period.
- (3) The final phase occurred after Hurricane Iniki and continued through much of 1993 when stagnation persisted but gradual improvement in unemployment took place.

Source: Hawaii 1993: Annual Economic Report

One prominent local economist interviewed for this analysis indicated that Hawaii's "recession" was not a recession at all, but merely a period of flat economic performance. This is supported by information on growth in jobs which experienced extremely low upward change as opposed to the net *loss* in jobs normally associated with a recessionary cycle. State of Hawaii and Oahu job trends are presented later in this section as Exhibit IV-10.

Stronger signs of economic recovery are being demonstrated in 1994, in which "there are enough positive forces at work to impart the most encouraging outlook in almost two years." This recovery is being fueled by an upturn in visitor arrivals and tourism expenditures that have "raised hopes that the three year tourism slump [is] at an end." (Source: First Hawaiian Bank Research Department, Supplement to Economic Indicators, May/June 1994)

Long-term view. Economists believe that the continuation of slower, more sustainable economic growth rate in Hawaii will "rely on internal rather than external forces." The local

economy has been buoyed from the harsher recession experienced elsewhere in the U.S. by:

- The lowest interest rates in thirty years;
- A continued low-inflation environment; and
- Sectoral strength in the areas of insurance, diversified agriculture, residential construction, health care and financial services. For example, growth in health care jobs was roughly equal to the loss of tourism jobs during the visitor industry downturn. (Source: Bank of Hawaii, 1994)

Transportation

Oahu's strategic location between the West Coast and Asia places it 2,400 statute miles from San Francisco and 4,000 miles from Tokyo. Due to its location, Oahu serves as the gateway to both the Mainland U.S. and Asia/Pacific regions.

Supporting growth and development on Oahu is a transportation system which includes land, air and sea modes. While most of Hawaii's visitors and residents arrive and travel interisland by air, nearly all of the goods needed in the islands arrive through its harbors.

Land transportation. Hawaii maintains a system of 4,102 miles of interstate, state and county roads. Oahu has two interstate highways, H-1 and H-2 (which is currently being widened), with a third, H-3, currently under construction. Public mass transportation is limited to Oahu's TheBus service which served 79 million passengers in 1993.

The H-1 freeway provides multi-lane access to the subject property from the urban core and Central Oahu. Additional regional arterials such as Kapolei Parkway and the North South Road are planned for the Ewa region.

Ocean transportation. According to the State Department of Transportation's Harbors Division, four-fifths of the goods required by Hawaii are imported, and 98% percent of those arrive by sea. The interisland cargo system supplies Neighbor

Islands with over 5 million tons of goods per year. Oahu has two deep draft commercial harbors, Honolulu Harbor and Barbers Point. The Barbers Point Harbor is located in the Ewa region and supports commercial activity in the area. A third, the famous Pearl Harbor, is controlled by the U.S. Navy.

Air transportation. The advent of overseas air transportation revolutionized Hawaii's economy. Prior to the introduction of regular air service to Honolulu, access was limited to ocean liners and other forms of sea-based transportation. By 1990, only two out of every thousand arrivals to Hawaii was by ship. Almost all scheduled interisland passenger travel is now by air.

Facilitating the gateway position of Oahu is the Honolulu International Airport, which serves over 13 million overseas and interisland passengers annually. In addition, the location of a new reliever airport is under consideration at the site of the Naval Air Station at Barbers Point within the Ewa region. The opportunity to locate a civilian-use airport within Ewa will occur when military aviation is curtailed by the planned base closure. Location of such a commercial facility would provide additional economic stimulus to the Ewa region.

General Trends Conclusion

The general economic trends presented in the preceding discussion lead to several conclusions:

Hawaii versus Mainland economic trends - Hawaii's business cycles tend to lag Mainland cycles by twelve to eighteen months and tend to be shallower during recessionary periods. For example, during the recent recession Hawaii largely experienced no growth rather than declining economic indicators such as those experienced in other regions of the United States. Further, during the recent decline in tourism the local economy showed a fair degree of strength within other sectors.

Transportation - Oahu and the subject region of Ewa are well-served by transportation infrastructure. The H-1 freeway provides vehicular access to both urbanized and newly-urbanizing areas of Oahu and intra-regional arterials are planned.

RESIDENTIAL INDICATORS

Population growth can be closely correlated with household formation, which in turn increases the demand for housing. Specific social and economic indicators which support the demand for future residential development on Oahu include:

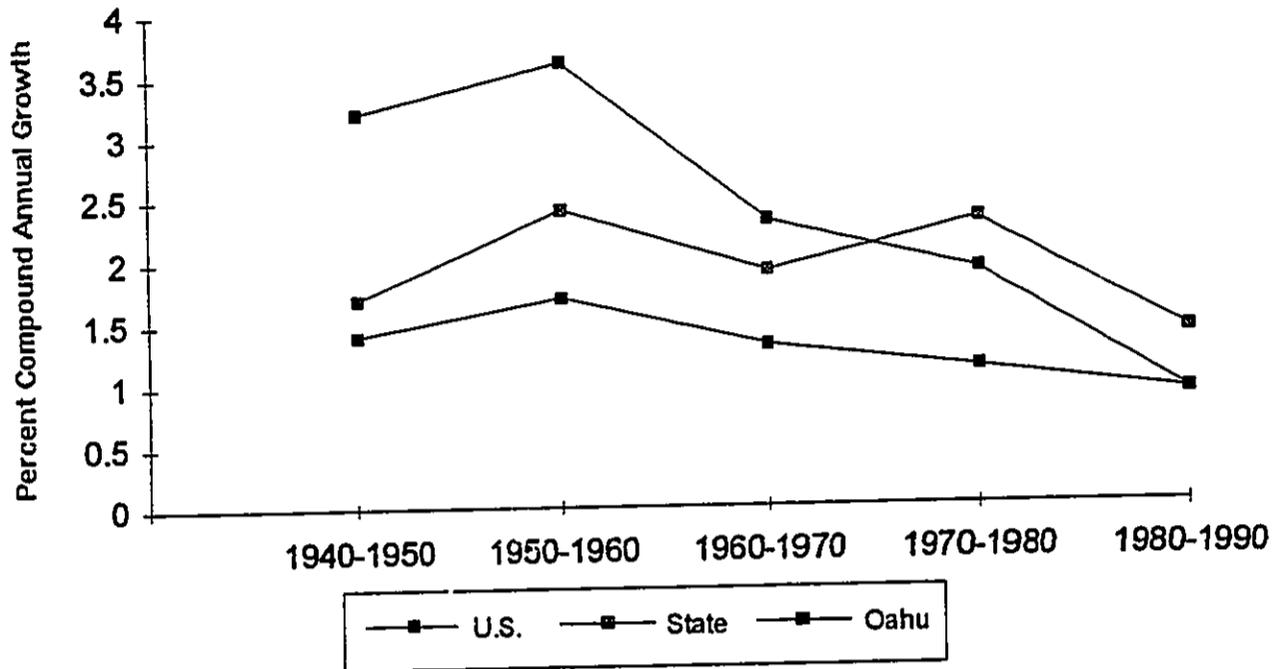
- Population growth
- Household formations
- Income trends
- Residential building permit trends
- Oahu's for-sale residential market
- Mortgage interest rates

Population Growth

Historical Trends. Oahu has experienced population growth during every census period since 1950. Since the spike in growth following statehood in 1959, Oahu's percent growth rate of population has gradually tapered off while greater increases were seen on the Neighbor Islands, as shown in Exhibit IV-1, *Population Trends, 1940-1990* on the following page. Despite the deceleration in the rate of growth, the absolute increase in Oahu residents continues.

Exhibit IV-1
East Kapolei Project

Population Trends, 1940-1990



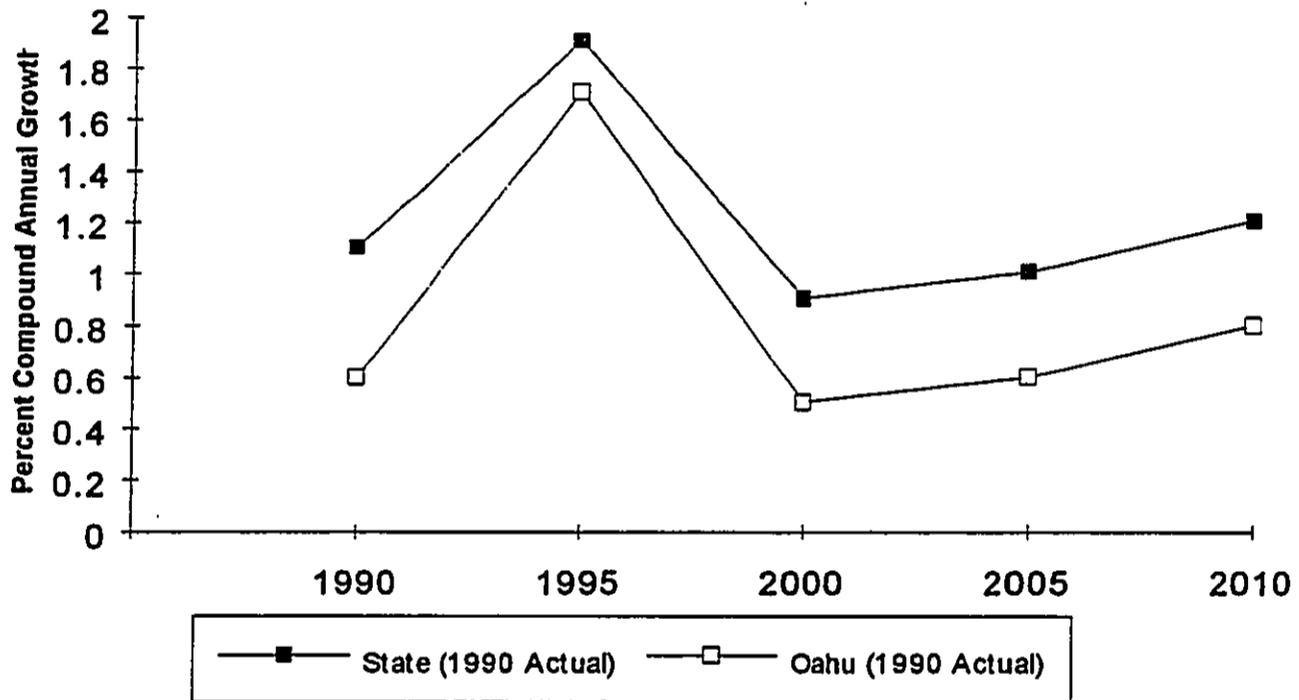
Oahu Population Projections. Oahu's resident population is expected to grow by 20 percent in absolute numbers between 1990 and 2010, according to the State's Series M-K projections. Population trends illustrated in Exhibit IV-2, *Population Projections - State and Oahu (Series M-K)* on the following page can be summarized as follows:

- Compound annual growth in population in both the State and Oahu is expected to remain positive, with a range from 0.6 percent to almost 2 percent along the trend line shown in Exhibit IV-2.
- The lower end of these growth rates falls below the percentage growth experienced in the 1980s. However, as the base population increases, the absolute changes are not materially different.

- Between 1980 and 1990 Oahu's population grew by 73,666 persons. Between 1990 and 2000 absolute growth is expected to increase to 96,569 persons, before falling off to 66,700 persons in the 2000 to 2010 period. As such on average while the percentage change in population is expected to gradually decline, the absolute growth may actually approximate or exceed the level experienced in the 1980s.

Exhibit IV-2
East Kapolei Project

Population Projections
State and Oahu (Series M-K)



Regional Population Projections. The fastest growing region on Oahu between 1994 and 2010 will be the Ewa region, according to the island's General Plan. The allocation of future population on Oahu is guided by the General Plan's Population Objective C Policy 4, which states:

Seek a year 2010 distribution of Oahu's residential population which would be in accord with the following table:

Location	% of Year 2010 Islandwide Population	Population General Plan Range
PUC	45.1% - 49.8%	450,800 - 497,800
Ewa	12.0% - 13.3%	119,900 - 132,900
Central Oahu	14.9% - 16.5%	148,900 - 164,900
East Honolulu	5.3% - 5.8%	53,000 - 58,000
Koolaupoko	11.0% - 12.2%	109,000 - 121,900
Koolauloa	1.3% - 1.4%	13,000 - 14,000
North Shore	1.6% - 1.8%	16,000 - 18,000
Waianae	3.8% - 4.2%	38,000 - 42,000
Total	95.0% - 105%	949,500 - 1,049,500

Based on General Plan guidelines, the Planning Department projects regional population growth trends using its computerized Land Use Model. According to this model:

- The Ewa region's annual population growth rate is estimated to accelerate from 1.87 percent between 1980-1990 to 3.94 percent between 1990-2010.
- The growth rate of the Central Oahu region is projected to decline from 2.54 percent annually to 1.33 percent during the same time periods.
- The Oahu annual population growth rate is estimated to be less than one percent overall.

(Source: Forecast of Population, Housing and Employment on Oahu by Small Area 1990-2010, Planning Department, 1993, Table 3)

Household Formations

New household formations will support the demand for future residential development on Oahu. New households will result from two major factors: the *rate of growth in housing stock* and the *decline of household size*.

Rate of Growth in Housing Stock. Exhibit IV-3, *Trends: Oahu Population and Housing Stock*, illustrates Oahu's historic and projected trends.

**Exhibit IV-3
East Kapolei Project**

Trends: Oahu Population and Housing Stock

Year	Oahu Population	Housing Stock
1980	762,565	230,214
1990	836,231	281,683
2010	999,500 ¹	359,827 ²
Percent Change (1980-2010)	31%	56%
Compound Annual Growth (1990-2010)	0.90%	1.23%
¹ Series M-K and Oahu <u>General Plan</u> (midpoint) ² Planning Department Land Use Model projection (Source: <u>Forecast of Population, Housing and Employment on Oahu by Small Area 1990-2010</u> , Table 4)		

The following observations can be made relative to the information presented in the chart above:

- The rate of growth in the housing stock typically lags population growth in Hawaii, creating latent demand for new residential housing product.
- The increase in housing stock on Oahu is expected to be almost double the rate of population growth between 1980 and 2010. However, this may not be sufficient to alleviate the doubling up of households that occurs on Oahu.

Decline in Household Size. Household size in Hawaii ranked second among the fifty states in 1990 with 3.01 persons (by the census definition of households), reflecting among other factors the frequency of doubling up. However, the Planning Department anticipates a decrease in household size is expected over time to approximately 2.8 in 2010, which is conservative in the consultant's opinion. The decline in household size is expected to follow a national demographic trend toward smaller family units and the expectation that the availability of affordable housing on Oahu will enable many doubled-up families to acquire their own homes.

Income Trends

Hawaii's total and disposable personal income more than doubled between 1980 and 1990, reflecting a rapidly growing economy (State of Hawaii Data Book, 1993-94, Table 13.4). However, according to statistics quoted by the Bank of Hawaii, real personal income growth in the state decelerated during the late 1980s, reaching a low in 1991. A slow upward trend began several quarters after the nationwide trend of renewed growth in real personal income (Hawaii 1993: Annual Economic Report). The trend of slow growth in personal income, when evaluated along with accelerating housing price trends, is a strong indicator for the development of affordable and moderate-priced housing.

Residential Building Permit Trends

Exhibit IV-4, *Oahu Building Permit Trends*, illustrates the historic trends in permitting activity in the City and County of Honolulu from 1962 through 1993. Housing categories include single family detached, duplex, multifamily and total residential units permitted. The average annual permitting levels during this period were 2,493 single family units, 137 duplex units and 3,756 multifamily units.

Building permit trends over the past few years follow the real estate trend of decreasing production of single family homes during economic slumps and increasing production of multifamily homes. This pattern occurred in the 1990-91 time frame. In 1992 and 1993 conditions such as affordability and a favorable interest rate environment spurred renewed growth in the construction of single family homes.

Although the pattern of building permits does not present clearly definable real estate cycles as one might expect, real estate cycles are more apparent in the progression of resale housing prices discussed in the following section.

East Kapolei Project
Market Assessment

Exhibit IV-4
East Kapolei Project

Oahu Building Permit Trends, 1962 - 1993

Year	Single Family Detached		Duplex		Multi Family		Total Residential	
1962	3654		170		4076		7900	
1963	3354	-8.21%	190	11.76%	2891	-29.07%	6435	-18.54%
1964	3671	9.45%	90	-52.63%	2868	-0.80%	6629	3.01%
1965	4512	22.91%	132	46.67%	5551	93.55%	10195	53.79%
1966	2944	-34.75%	52	-60.61%	6320	13.85%	9316	-8.62%
1967	3005	2.07%	46	-11.54%	3159	-50.02%	6210	-33.34%
1968	3683	22.56%	330	617.39%	6043	91.29%	10056	61.93%
1969	3569	-3.10%	286	-13.33%	7285	20.55%	11140	10.78%
1970	3809	6.72%	212	-25.87%	3957	-45.68%	7978	-28.38%
1971	3771	-1.00%	70	-66.98%	4017	1.52%	7858	-1.50%
1972	3352	-11.11%	112	60.00%	6902	71.82%	10366	31.92%
1973	3008	-10.26%	312	178.57%	9745	41.19%	13065	26.04%
1974	1626	-45.94%	464	48.72%	11070	13.60%	13160	0.73%
1975	1078	-33.70%	112	-75.86%	4240	-61.70%	5430	-58.74%
1976	1326	23.01%	56	-50.00%	3142	-25.90%	4524	-16.69%
1977	2210	66.67%	84	50.00%	2389	-23.97%	4683	3.51%
1978	2075	-6.11%	260	209.52%	2111	-11.64%	4446	-5.06%
1979	3046	46.80%	134	-48.46%	1854	-12.17%	5034	13.23%
1980	1650	-45.83%	46	-65.67%	3365	81.50%	5061	0.54%
1981	768	-53.45%	42	-8.70%	1873	-44.34%	2683	-46.99%
1982	891	16.02%	32	-23.81%	2553	36.31%	3476	29.56%
1983	1562	75.31%	60	87.50%	1220	-52.21%	2842	-18.24%
1984	2199	40.78%	112	86.67%	942	-22.79%	3253	14.46%
1985	2313	5.18%	124	10.71%	1781	89.07%	4218	29.66%
1986	2024	-12.49%	112	-9.68%	2076	16.56%	4212	-0.14%
1987	2684	32.61%	124	10.71%	785	-62.19%	3593	-14.70%
1988	2001	-25.45%	172	38.71%	1377	75.41%	3550	-1.20%
1989	2026	1.25%	124	-27.91%	1852	34.50%	4002	12.73%
1990	2054	1.38%	150	20.97%	1171	-36.77%	3375	-15.67%
1991	1335	-35.00%	70	-53.33%	3885	231.77%	5290	56.74%
1992	2326	74.00%	40	42.86%	2954	31.52%	5320	0.57%
1993	2223	4.43%	31	47.50%	2290	22.48%	4544	14.6%

Source: Building Department, City and County of Honolulu

The Trend toward Affordability. A pronounced trend toward affordability has been seen recently in housing, especially on Oahu. Bank of Hawaii, in its publication Construction in Hawaii 1994, presents its own analysis of statewide building permit data which reflects a strong indication of greater affordability in both single family and multifamily new residential product.

Single family product. Developers appear to be holding the line on construction costs for single family homes. Over the past four years the estimated per-unit construction cost of single family units increased only 1.9 percent annually, from \$120,000 to \$122,286.

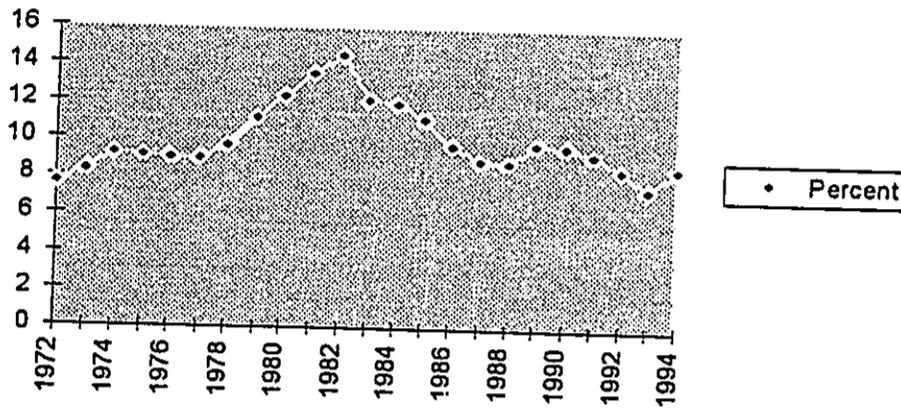
Multifamily product. Estimated unit construction cost for multifamily homes has fallen radically from a high of \$137,242 in 1991 to a low of \$77,341 in 1993. This 44 percent drop indicates that multifamily construction is "decidedly in the affordable range." Oahu accounted for 82 percent of this impact during 1993.

Interest Rate Trends. Affordability has also been supported by the lowest long-term interest rates since 1973, as shown in the trend line in Exhibit IV-5, *Long Term Mortgage Loan Rates: 1972-1994* on the following page. Interest rates have an important impact on affordability for many buyers, where a slight change in rates makes the difference between continuing to rent and being able to buy a new home.

Interest rates also affect the so-called "gap group" of buyers. The gap group includes families and individuals who do not qualify for affordable housing based on income, can afford higher monthly payments due to their family income, but find it difficult to come up with a down payment.

Exhibit IV-5
East Kapolei Project

Long-Term Mortgage Loan Rates, 1972-1994



Source: Statistical Abstract of the U.S., 1981, 1993

Oahu's For-Sale Residential Market

Overall Resale Market. Oahu has experienced an upward trend in the price of resold residential units over time. According to purchased data from Prudential Locations, Inc., compound annual growth (CAG) rates of the average prices of residential resales were 12.5 percent per year for single family homes and 6.4 percent for multifamily homes, as shown in Exhibit IV-6, *Increases in Oahu's Average Resale Prices* on the following page:

Exhibit IV-6
East Kapolei Project

Increases in the Average Oahu Resale Prices

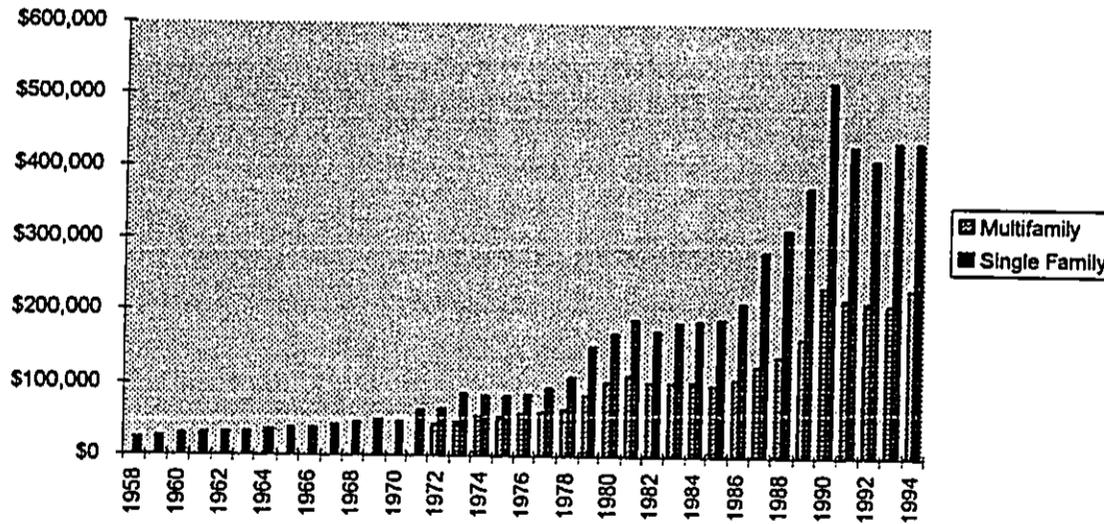
Time Frame	Type of CAG Product	Low	1993	Rate
	Oahu			
1958 - 1993	Single Family	\$23,000	\$436,279	12.5%
1972 - 1993	Multifamily	\$44,000	\$209,650	6.4%

Source: Prudential Locations, Inc.

Year-by-year residential resale pricing trends on Oahu are presented graphically below in Exhibit IV-7, *Trends in Average Resale Prices on Oahu: Single Family (1958-1994) and Multifamily (1972-1994)*.

Exhibit IV-7
East Kapolei Project

Trends in Average Resale Prices on Oahu: Single Family (1958-1994) and Multifamily (1972-1994)



Data Source: Prudential Locations, Inc.

The trend line of the previous chart indicates a series of real estate cycles of approximately nine years in duration with minor subcycles. It also shows that prices tend to move up during economic upswings and stabilize rather than decline during slower growth periods. The data reflect few major dips, with the exception of 1991 which followed the spike in prices apparent in 1990.

The cyclical nature of the Hawaii real estate market is corroborated by Dr. Michael Sklarz of Prudential Locations, Inc., who in 1994 supported "the notion that the Hawaii real estate market follows an 8 to 10 year cycle which is apparent when one analyzes longer term time series." He added:

"While no two cycles are exactly the same, this approach does provide a potential roadmap for the future." Sklarz maintains that:

- Using the assumption of an eight-to-ten year cycle, the market should gradually increase to a peak in 1996-97 and rising prices should be seen in the 1997-98 period.
- Despite these expected upturns in the market, the rate of increase is expected to be "considerably slower" than the pace of the late 1970s or late 1980s.

The historical pattern of eight-to-ten year cycles should be interpreted with the proviso that future fluctuations in cycles may not be as pronounced as in the past. This could be true for several reasons:

1. The relatively few developers involved in large-scale development have the resources to keep up production through varying market conditions.
2. There is a greater diversity of product and price ranges than in the past, including a range of affordable in addition to traditional market-priced offerings.

These reasons indicate that although real estate cycles are likely to persist, market conditions may cause less variation than in the past. This is because developers may be able to switch between a wider array of products and price ranges as the type

of demand varies and thereby maintain production rates at a more stable level.

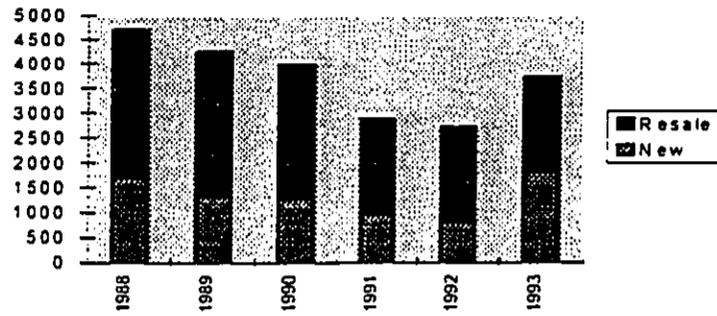
Proportion of Single Family versus Multifamily Residential Resales. On the following page, Exhibit IV-8, *Comparison of Single Family to Multifamily Housing 1988-1993*, shows that the proportion of single family detached to total residential units on Oahu has steadily decreased over time. This has resulted from a number of factors, including:

- The limited supply of urban-zoned land for development;
- An increase in the number of single parent families;
- Decline in housing affordability as growth in housing prices outpaced growth in income for many Oahu residents, forcing them into more affordable attached units; and
- An increase in low or medium density multifamily product offerings, as developers responded to affordable housing requirements by taking advantage of the lower per-unit construction costs associated with multifamily units.

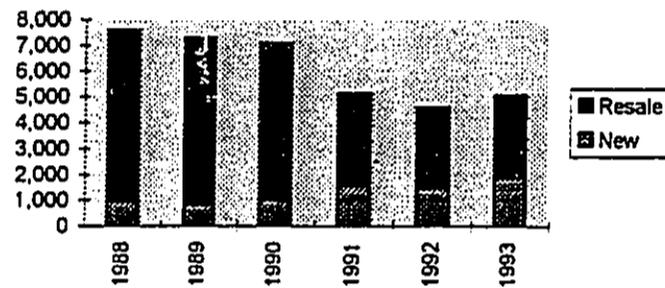
Exhibit IV-8
East Kapolei Project

Comparison of Single Family to Multifamily Housing 1988 - 1993

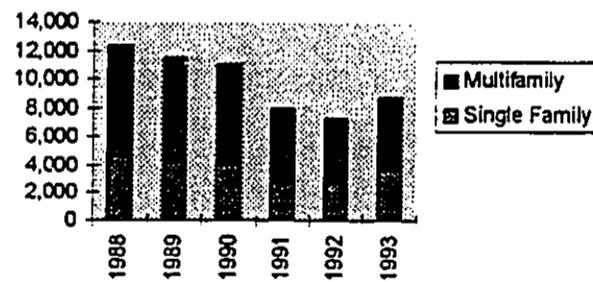
Single Family



Multifamily



Total Residential



Residential Indicators Conclusion

The residential indicators presented above lead to the following conclusions relative to the economic viability of the proposed project:

Population growth - Oahu's General Plan and Land Use Model forecast the most rapid population growth in the subject property's region of Ewa.

Household formations - The combination of increasing housing stock and decreasing household size will create demand for additional housing in the future on Oahu.

Income trends - After dipping in the early 1990s, real personal income in Hawaii has been rising very slowly. This slow rise in real income, combined with accelerating home prices, creates a need for affordable and moderate-priced housing.

Residential building permit trends - Trends over the last 32 years show an economic cycle of 8-10 years which may have less pronounced fluctuations in the future. Building permit trends also indicate a trend toward greater affordability, based on construction cost statistics.

Oahu's for-sale residential market - Prices for Oahu real estate have continued to grow since 1958 when the data series began, with approximately nine-year cycles. The past several years have shown a trend toward a higher proportion of multifamily units.

COMMERCIAL INDICATORS

Trends in the following indicators appear to support demand for further development of commercial space on Oahu:

- Growth in Gross State Product (GSP)
- Wage and salary employment
- Unemployment
- Consumer prices
- Retail sales
- Visitation and tourism expenditures

Commercial demand on Oahu is an important element of the economic analysis with regard to the subject development for two reasons. First, it will influence the development of the second city at Ewa as a true "growth pole" or secondary urban agglomeration, complete with a wide-ranging employment base. To a lesser degree commercial demand also will influence the demand for the neighborhood retail planned for the subject property. The strongest factors in support of the subject property's commercial potential will be proximity to housing and the university campus.

Growth in Gross State Product

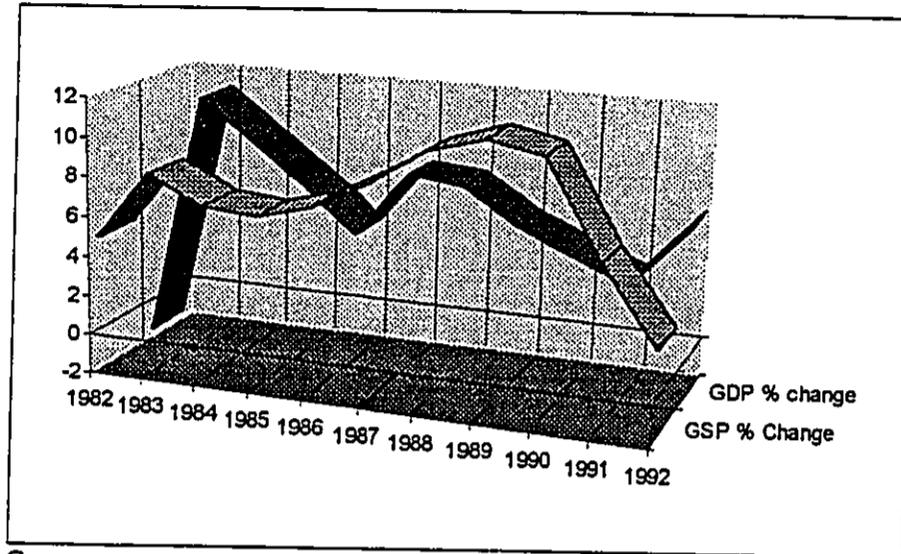
The Gross State Product (GSP) is an indicator of economic prosperity in a region. During the last half of the 1980s, Hawaii consistently experienced over five percent real annual growth in its GSP.

Exhibit IV-9, *Trends: Hawaii Gross State Product Versus U.S. Gross Domestic Product, 1982-1992*, illustrates the following:

- Growth continues to be positive (above zero), however the 1991-92 figures indicate that it has subsided from the brisk growth rate of the 1980s.
- Hawaii's business cycles tend to lag in time behind the Mainland's macroeconomic trends.

Exhibit IV-9
East Kapolei Project

Comparison of Hawaii Gross State Product
and U.S. National Domestic Product, 1982 - 1992



Sources: *Gross State Product*: State of Hawaii Data Book, 1993-94, Table 13.2
Gross Domestic Product: "Economic Indicators, June 1994," prepared for the Joint Committee by the Council of Economic Advisers, 103rd Congress, 2d Session

Wage and Salary Employment

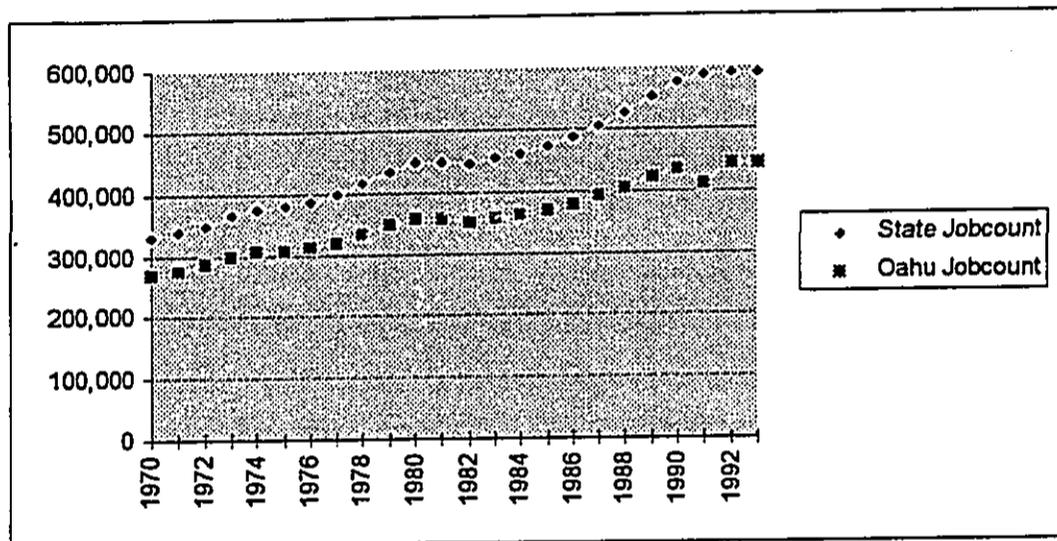
Jobs. Hawaii's long-term employment indicators show a basically healthy state economy, although one which is not immune to corrections such as the recessions in 1982 and 1991-92. Exhibit IV-10, *Trends in Wage and Salary Employment for the State of Hawaii and City and County of Honolulu, 1970-1993* reveals the following trends:

- Recent data indicate a basically flat trend of jobs with a 0.2% dip occurring in 1993.
- On a statistical basis as Oahu goes, so goes Hawaii. The close correlation that exists between shifts in economic performance on Oahu and the State as a whole is illustrated in the employment trend lines.

Job growth may become positive again in 1994 with the resurgence in visitor industry activity, although growth will likely be modest compared to the pace of the late 1980s.

Exhibit IV-10
East Kapolei Project

Trends in Wage and Salary Employment for the State of Hawaii and City and County of Honolulu, 1970-1993



Source: State of Hawaii Data Book, 1993-94, Table 12.6

Annual Wages per Employee. According to the Department of Business, Economic Development and Tourism, Hawaii ranked twelfth among the fifty states in annual wages per employee for all workers in 1992. As shown in Exhibit IV-11, *Annual Change in Wages per Employee*, wages per employee exhibited annual increases from 1982 through 1991, the last year for which this data was available. After a dip in the percent increase between 1990 and 1991, wages rebounded in 1992.

Exhibit IV-11
Annual Change in Wages Per Employee

Year	Total Annual Wages/Employee (\$)	Percent Change Year Over Year
1982	15,353	
1983	16,108	+4.9%
1984	16,701	+3.7%
1985	17,329	+3.8%
1986	18,101	+4.5%
1987	19,091	+5.5%
1988	20,444	+7.1%
1989	21,624	+5.8%
1990	23,167	+7.1%
1991	24,104	+4.0%
1992	25,613	+6.3%

Source: State of Hawaii Data Book, 1993-94, Table 12.25

Employment Composition. Equally as important as the level of overall employment to Oahu's economy is the type of employment. An analysis of predicted job growth on Oahu and its composition is presented on the following page in Exhibit IV-12, *Composition of Employment on Oahu, 1985 - 2010*.

Exhibit IV-12
East Kapolei Project

Composition of Employment
on Oahu, 1985-2010

Employment Island of Oahu (in thousands)	1985	1990	% Chg	1995	% Chg	2000	% Chg	2005	% Chg	2010	% Chg
Manufacturing	5.7	6.7	18%	7.1	6%	7.7	8%	8.2	6%	8.7	6%
Transp. commun, utilities	27	29.7	10%	31.2	5%	32.3	4%	32.8	2%	33	1%
Trade (excl. eating/drinking)	60.4	70.3	16%	76	8%	77.6	2%	83.7	8%	86.7	4%
Eating and drinking	31.5	36.6	16%	38.5	5%	40.1	4%	41.1	2%	42.2	3%
Banking and finance	26.9	29.4	9%	32.1	9%	33.4	4%	34	2%	34.8	2%
Services, other	71.1	86.8	22%	100	15%	111	11%	119.8	8%	129	7%
Government											
State/local	47.8	50.1	5%	52.6	5%	54.8	4%	55.8	2%	56	0%
Federal	31.4	31.3	0%	31.7	1%	32.1	1%	32.5	1%	32.9	1%
Total	79.2	81.4	3%	84.3	4%	86.9	3%	88.3	2%	88.9	1%
Self-employed	24.7	26.3	6%	31.2	19%	33.7	8%	35.7	6%	37.7	6%

Source: Department of Business Economic Development and Tourism, Series M-K

As shown in the previous table, the greatest increases are expected in service, manufacturing and retail trade jobs. These trends will support the planned neighborhood retail land uses on the subject property.

White Collar Employment. Office demand can be related to increases in white collar employment categories. The primary white collar employment category is the finance, insurance and real estate sector. Since a portion of the service sector is typically housed in office space, the growth in these categories

should support a moderate level of continued office development.

The advent of the second city at Ewa/Kapolei is likely to cause some regional redistribution of white collar employment due to the following plans:

- The State of Hawaii has a master plan for its civic center in Kapolei. The center will initially consist of six state office buildings encompassing 1.2 million square feet of space and 567,000 square feet of space for judiciary, library and history museum facilities. The first Kapolei state office building with 120,000 square feet of useable floor space is expected to be ready for occupancy in late 1997 or early 1998.
- Major new Bank of Hawaii office building facilities will accommodate 1,200 white collar workers within a 250,000 square foot building.
- Location of the University of Hawaii at West Oahu campus within the second city area eventually will bring with it a full complement of faculty and administrative staff.
- Location of a civic center at the City of Kapolei will provide regional municipal services by the City and County of Honolulu.

Manufacturing. Manufacturing sector growth is expected to be one of the largest in the Oahu employment market. This strong growth, combined with decreases in the supply of industrial space, should sustain demand for light industrial land on Oahu.

The subject region is well positioned to take advantage of growth in manufacturing and industrial activity because of the existing James Campbell Industrial Park and the addition of the light industrial/warehouse-oriented Kapolei Business Park. Jobs in these areas will in turn result in housing and retail demand within the market study area.

Wholesale and retail employment. Wholesale and retail employment growth has the greatest effect on the demand for

retail space. According to Exhibit IV-12 above, this sector is projected to have a roller coaster future.

- A stabilizing force may be the additional demand which comes from growth in the service sector, restaurant employment and banking and financial services. Often these businesses choose retail locations in order to serve the public.
- Employment in warehousing could be somewhat destabilized due to the advent of volume discounters in Hawaii, whose method of doing business eliminates much of the warehousing and distribution component. However, such discounters still remain a relatively small proportion of the total retail scene in Hawaii.

The fluctuation in retail employment on Oahu is derived to a significant degree from fluctuations in tourism-related demand. The neighborhood retail type of commercial development planned for the subject property will be less susceptible to these fluctuations because it will service the immediate residential area and the future university campus.

Unemployment

Throughout the 1980s and into the 1990s, Hawaii's employment trends have exhibited strength relative to Mainland performance. The highest unemployment rate in Hawaii between 1987 and 1992 was equal to the lowest Mainland unemployment rate.

According to Bank of Hawaii economists writing in Hawaii 1993: Annual Economic Report, the following trends are evident with regard to unemployment in Hawaii:

- In 1989, Hawaii ranked 49th in the nation for business failures. By 1993 business failures, loan delinquencies and foreclosures had risen but still placed the state among the better performing states, even those where economic recovery had begun.

- Already low, Hawaii's unemployment rate may continue to decline gradually during 1994 as the economic recovery continues to take hold.

Consumer Prices

Consumer prices on Oahu have exceeded national trends in the recent past, although the trend is still one of low inflation. For example, Oahu experienced a 3.3 percent change in consumer prices from 1992-93, compared to 4.7 percent between 1991-2 and 10.5 percent in the previous Hawaii recessionary period in 1980-81.

Retail Trends

It has long been stated that Oahu is underserved with regard to retail space. This is illustrated both by square feet per resident estimates and sales per square foot of retail space indicators. This continuing demand will support anticipated neighborhood retail operations on the subject property well into the future.

Retail Sales Performance. Hawaii's retail sales performance has been consistent with other positive economic trends in both real terms (i.e., constant dollars) and when compared to Mainland markets. For example, Mainland retail sales fell dramatically in 1990 while Hawaii's sales continued to be robust but at a slightly lower level.

Hawaii's healthier retail climate is the result of a number of factors:

- Limited supply of retail space in the islands compared to relatively overbuilt areas of the Mainland.
- Limited supply which creates higher per square foot retail expenditures.
- Tourism expenditures which bolster the local retail trade by increasing the retail market significantly beyond demand generated by residents. In 1993 it was estimated that retail spending from tourists accounted for between 20 and 25

CORRECTION

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

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percent of total retail sales in the state. (Bank of Hawaii, Hawaii 1993: Annual Economic Report).

Structural change in Hawaii retail trade. Hawaii retail sales remained stable throughout the recent recessionary period. According to Bank of Hawaii, this reflected "a greater underlying strength of the economy and less dependence on visitor purchases than has tended to be assumed."

The State of Hawaii followed the rest of the nation's trend toward large discount and wholesale outlets by almost a decade. This has significantly altered the pricing structure for retail goods and the type of goods being purchased by residents and visitors alike (Bank of Hawaii, Hawaii 1993: Annual Economic Report). For example, Hawaii residents have become more price-conscious and make regular bulk purchases of staple commodities at warehouse discounters. This has affected the pricing of retail goods at smaller stores, which must try to compete.

Hawaii is capitalizing on another national trend at the present time: the enhanced purchasing power provided by recent devaluation of the dollar relative to major world currencies. While not a coveted trend, the dollar's loss has been retailers' gain because visitors have greatly increased their level of purchasing (Time, September 5, 1994, "Shopping Spoken Here"). Locally, visitor traffic to the discount stores and manufacturers' outlets such as Waikale Power Center has resulted in some redistribution of retail expenditures from prior favorites such as duty free shops (Hawaii Investor, September 1994, "A Yen for Waikale").

Visitation and Tourism Expenditures

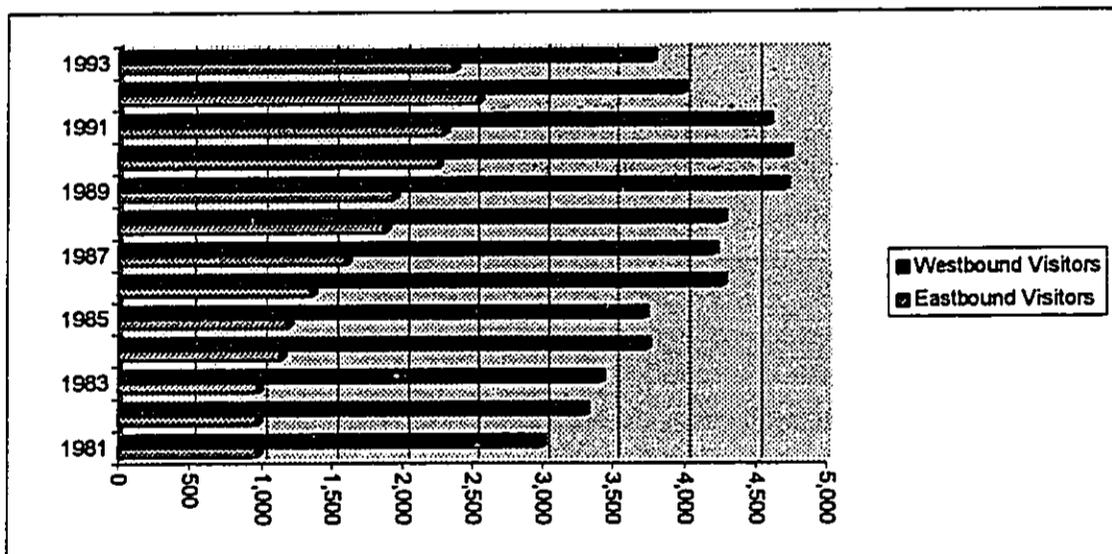
The Economic Impact of Tourism. The Hawaii economy benefits greatly from its role as a major tourist destination. Tourists support local employment directly through employment in service industries and indirectly in construction and other job categories. Continuing demand for tourism on Oahu is significant to the subject property in several ways:

- Oahu has been able to provide a more steady source of employment for its tourism work force than other islands and will therefore continue to support the demand for residential development.
- The resort-oriented communities of Ko Olina and Ewa Marina will contribute to the Ewa/Kapolei regional economy through an infusion of visitor expenditures.
- Oahu visitors make purchases which will continue to sustain retail demand throughout the island.

Visitor Arrivals. Over time the distribution between Mainland U.S. (westbound) and Japanese and Asian (eastbound) visitors has changed dramatically. Exhibit IV-13, *Hawaii Visitor Arrivals*, illustrates this contrast as well as the decline in visitors experienced in 1991 and 1992 during the Mainland and Japanese recessionary periods.

Exhibit IV-13
East Kapolei Project

Hawaii Visitor Arrivals



Source: State of Hawaii Data Book, 1993-94 Table 7.3

1994 Results. Visitor counts for the first half of 1994 show a significant upturn to levels not seen for the past three years. This will in turn result in increased visitor expenditures.

Commercial Indicators Conclusion. Based on the preceding discussion, numerous factors appear to support demand for further development of commercial space on Oahu:

Growth in Gross State Product - growth continues to be positive and to lag Mainland business cycles.

Wage and salary employment - long term job growth has been strong, although recent statistics show a relatively flat trend. Job growth may increase in 1994 due to the recent surge in tourism. The Ewa region is likely to benefit from growth anticipated by the State's M-K projections in several categories, including white collar employment and manufacturing.

Unemployment - Hawaii has exhibited considerably more strength in this indicator than Mainland regions. Even during the recent recessionary period, business failures in Hawaii were among the better performing states.

Consumer prices - Hawaii exhibits relatively low inflation in consumer prices.

Retail sales - Hawaii's retail industry has been undergoing a structural transformation which is making room for discount retailers by changing shopping patterns and retail pricing.

Visitation and tourist expenditures - After a three-year slump, tourism arrivals and expenditures appear to be rebounding in 1994.

AREA REVIEW CONCLUSION

The State of Hawaii, especially the island of Oahu, has demonstrated substantial growth in all sectors of the economy over time. Based on current and past economic trends, such growth is expected to continue for the foreseeable future and should support development of the site. Housing demand -- especially for affordable product such as that being offered in the proposed development -- has remained strong throughout the recent recessionary period and is expected to remain strong in the coming years.

Section V
RESIDENTIAL

Section V

RESIDENTIAL

INTRODUCTION

The Oahu housing market provides a variety of residential products ranging from high rise luxury condominiums and oceanfront homes to older plantation homes and small ranches. This wide spectrum of homes is located over a broad geographic base extending from Honolulu's primary urban center to the rural communities of Leeward, Windward and the North Shore areas. The dramatic variety in residential products also contributes to great diversity in the price of housing.

While housing and its associated pricing vary greatly on the island of Oahu, one thing is universally known: Honolulu's housing ranks as the most expensive in the nation. Relatively low wages, high costs of living, a limited supply of land and high construction costs all lead to a shortage of affordable and gap housing for Honolulu's existing and future population. The demand for affordable housing is further illustrated by:

- *A relatively high ratio of renters to owners.* This proportion was 48 percent renters in the 1990 census (Source: U.S. Census Bureau).
- *The phenomenon of "pent-up demand."* In the 1990 census over 17,000 Oahu households or about 7% reported more than one "subfamily" (married couple with or without children living in a household with relatives). This is a figure which census experts consider understated (Source: U.S. Census Bureau).
- *High percentage of shared accommodations.* In 1992, it was estimated that about 22 percent of Hawaii households were either doubled up or sharing with unrelated families or individuals (Source: Hawaii Housing Policy Study, 1993).

Organization of this Section. This section of the Market Assessment presents the existing and future estimates of supply and demand for housing on Oahu. Included throughout this analysis are discussions regarding the market study area's relationship to the overall housing market. The section concludes with a description of the proposed property's development concept (which is dominated by a residential component of approximately 10,000 units), an estimate of the property's market position and estimated schedule of absorption.

MARKET STUDY AREA

Based on an assessment of actively selling and proposed subdivisions it is the consultant's opinion that the relevant competitive supply for the subject property will come from the master planned communities within the Ewa Development Plan Area and along the western H-1 corridor including the communities of Waikele and Royal Kunia. These two communities are within the Central Oahu Development Plan Area.

SUPPLY AND DEMAND ANALYSIS

The following discussion provides an explanation of the analysis of interaction between supply and demand within the residential market on Oahu and within the defined market study area.

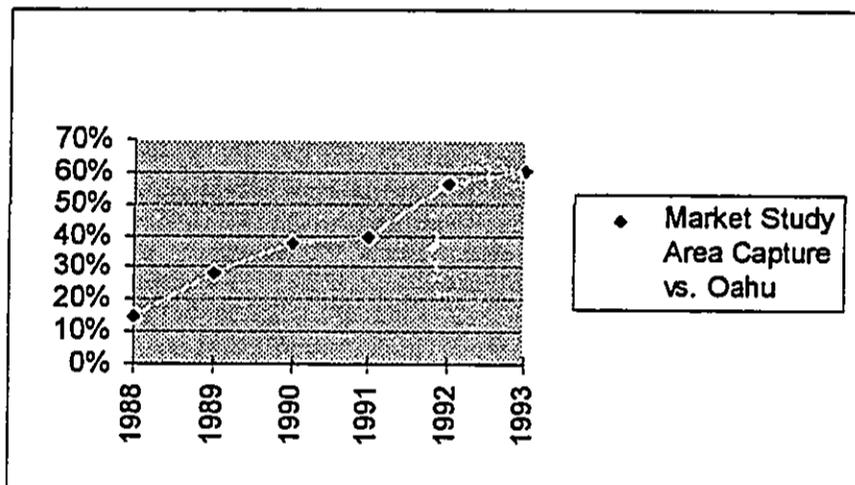
DEMAND

The calculation of future demand for housing is a function of both population growth and a need for vacancy to provide a healthy real estate market. Once housing demand is calculated for Oahu, it must be allocated to the market study area to project future demand in the area of the subject property.

The demand for housing can be closely associated with the formation of new households within a growing population. In an undersupplied market area the direction of demand is typically affected by the location of the supply. Exhibit V-1, *New Home Sales: Market Study Area Capture vs. Oahu*, shows how the proportion of Oahu's new residential supply provided by the market study area quadrupled between 1988 to 1993 (from fifteen percent to over 60 percent).

Exhibit V-1
East Kapolei Project

New Home Sales: Market Study Area Capture vs. Oahu



Source: Prudential Locations, Inc. (for raw data)

Calculation of Market Study Area Demand

The following sections discuss the expected sources of demand for additional residential units within the market study area. Demand factors include estimated growth in households (as a function of population and household size) and a provision for vacant units. The calculation of demand for additional housing in the market study area is based on the following analyses:

- (1) Estimation of future increases in households are based on future population;

- (2) Allowance for vacant units needed for a healthy real estate market;
- (3) Calculation of Oahu residential unit demand in 2010;
- (4) Allocation of Oahu demand to the market study area based on its forecast proportion of the island's population;
- (5) Adjustments to study area demand based on expected market conditions; and
- (6) Final calculation of demand within the market study area in 2010.

(1) Estimation of Increases in Households

Estimated Occupied Housing Units by 2010: 352,000 units

Rationale

The required number of occupied housing units that will be needed in the year 2010 -- approximately 351,551 units -- is a derived estimate based on:

(a) The Planning Department's Land Use Model projection of 359,827 units in 2010. This is based on a household size of approximately 2.8 persons. (Source: Forecast of Population, Housing and Employment on Oahu by Small Area 1990-2010, Table 4, "Housing Growth"); and

(b) Netting out the built-in vacancy factor of 2.3 percent which is included in the Land Use Model. The reason for this recalculation is to apply a more healthy vacancy rate of five percent to the estimation of Oahu housing demand.

The methodology for deriving occupied units is shown in Exhibit V-2, *Calculation of Occupied Households*.

Exhibit V-2
East Kapolei Project

Calculation of Occupied Households

Total Oahu Unit Demand 2010 - Land Use Model	359,827
Built-in vacancy factor of Land Use Model	2.30%
Occupied Oahu households (net of vacancy factor)	351,551

(2) Allowance for Vacancy on Oahu

Estimated Number of Vacant Units as of December 31, 2010: *18,000 units*

Rationale

A certain level of vacancy is considered healthy in any market area. This vacancy level allows the free movement of the population in and out of a community and within the community.

- According to the 1990 U.S. Census, the vacancy factor in the Honolulu residential market area was 5.87 percent. This factor included both owned and rented units.
- A rule of thumb of five percent for desirable vacancy level in residential communities is used by organizations such as the Urban Land Institute and the U.S. Department of Housing and Urban Development.

A vacancy rate of five percent for Oahu has been utilized in this analysis. This figure appears to be at a reasonable and conservative level. Applying this vacancy rate to the estimated demand for housing on Oahu, an additional 18,503 vacant units should be introduced into the market by 2010.

**(3) Calculation of Total Oahu Housing Demand
(occupied units plus vacancy)**

*Expected Total Demand for Oahu
by December 31, 2010:* *370,000 units*

Rationale

Based on the above discussion the total demand for new housing units on the island of Oahu in 2010 is estimated to be 370,054 units, which includes demand for 351,551 occupied units (derived in Step 1 above) plus an additional 18,503 to provide a healthy level of vacancy (derived in Step 2).

(4) Market Study Area Allocation - Unadjusted

*Expected Total Demand between
June 30, 1993 and December 31, 2010
in Market Study Area (includes existing units):* *53,000 to
57,000 units*

*Expected Additional Demand between
June 30, 1993 and December 31, 2010
in Market Study Area (excludes existing units):* *36,000 to
41,000 units*

Rationale

Through its General Plan, the City and County of Honolulu allocates a share of future Oahu population (and, consequently, housing demand) to each Development Plan (DP) Area. The range of percentage allocations to a DP Area is generally expressed in terms of low, mid and high points of projected population.

The market study area's percentage share of 2010 Oahu population and housing demand combines Ewa DP Area forecasts with those for Waikele and Royal Kunia from Central Oahu. The market study area share of total Oahu demand for housing is estimated between 14.23 (low), 14.88 (midpoint) and 15.53 percent (high). This range was derived by combining General Plan population projections for the Ewa DP Area with a proportion of Central Oahu growth as forecast by the Land Use Model's Traffic Analysis Zones for Royal Kunia and Waikele.

The foregoing analyses result in a range of unadjusted demand for the market study area of 52,661 residential units at the low end, 55,068 units at the midpoint or 57,474 units at the high end. Each of these estimates includes 16,891 existing units or a net of 36,070 at the low end, 38,477 units at the midpoint or 40,883 units at the high end (see Exhibit V-5 on page V-13 for detail of existing units).

(5) Adjustments to Demand for the University of Hawaii at West Oahu **+300 units**

Discussions with University of Hawaii (UH) officials indicate that there is likely to be additional demand for housing in the vicinity of the subject property resulting from the planned new campus at West Oahu. According to current estimates, there are expected to be approximately 4,000 mostly undergraduate students enrolled at the University of Hawaii at West Oahu in the year 2010. The estimate of 4,000 students in the year 2010 is based on:

- (1) The assumption that the State of Hawaii will meet student enrollment goals set by the Estate of James Campbell as a condition of the gift of land (2,750 students enrolled in 2006); and
- (2) Enrollment will steadily progress to levels estimated in Planning Department studies (6020 students in year 2020).

UH Manoa housing officials indicate that the Board of Regents has set a policy for commuter-oriented campuses such as Manoa and West Oahu of providing 25% of the students with on-campus housing. This means that approximately 3,000 students will need off-campus housing in 2010, although clearly many will continue to live at home and/or commute to campus. Housing officials further indicated that the highest demand for affordable rental situations is within two miles of campus, an area which includes the entire subject parcel.

University facilities planning officials indicated that construction of dormitories and on-campus faculty housing will

be a low priority during the first ten or so years, leaving students and a portion of the faculty in search of conveniently located, off-campus housing accommodations.

Demand for approximately 300 units on the subject property is estimated to accommodate groups of UH West Oahu students housed off-campus on the subject property plus a proportion of faculty and staff who will wish to relocate close to work.

(6) Calculation of Demand

Total adjusted demand for the market study area by 2010 is estimated at 52,961 to 57,774 units, including an existing inventory of 16,891 units. On the following page, Exhibit V-3, *Calculation of Demand, 1994 - 2010*, summarizes the foregoing discussion and includes comparative information on net demand (excluding existing inventory) in the market study area as a whole as well as its Ewa Development Plan Area portion.

Exhibit V-3
East Kapolei Project

Calculation of Demand
1994 - 2010

Oahu Housing Units - 2010	359,827			Land Use Model (includes vacancy)
Oahu Occupied Units - 2010	351,551			Net of 2.3 percent vacancy rate Refer to Step 1
Vacancy Provision	18,503			Refer to Step 2
Total Demand for Oahu - 2010	370,054			Occupied units plus 5% vacancy provision Refer to Step 3
Study Area Allocation Factor (% of total Oahu)	14.23 Low End	14.88 Midpoint	15.53 High End	General Plan and Land Use Model Refer to Step 4
Study Area Demand (unadjusted)	52,661	55,068	57,474	Refer to Step 4
Adjustment for University Housing Demand	300	300	300	Refer to Step 5
Total Adjusted Study Area Demand (includes 16,891 existing units)	52,961	55,368	57,774	
Comparative Data				
Net Additional Study Area Demand (total adjusted study area demand less existing units)	36,070	38,477	40,883	
Net Additional Demand - Ewa DP Area portion only	28,856	30,782	32,706	

SUPPLY

The analysis of the Oahu's housing supply is presented in the following steps:

- (1) Overview of the existing housing stock (supply) on Oahu;
- (2) Analysis of existing housing stock within the market study area;

- (3) Expectation of future additions to supply within the market study area during the scope of the analysis; and
- (4) Adjustments to supply based on expected future conditions.
- (5) Calculation of supply based on the above steps.

(1) Existing Supply on Oahu 295,000 units

The most recent information regarding the supply of housing within the Development Plan areas on the island of Oahu was provided by the City and County of Honolulu's Planning Department and is summarized on the following page in Exhibit V-4, *Distribution of Housing Stock by Development Plan Area (June 30, 1993)*.

Exhibit V-4, East Kapolei Project

Distribution of Housing Stock by Development Plan Area (June 30, 1993)

Oahu Statistics by Development Plan Area - 1992	Existing Housing Stock as of June 30, 1993	Share of Housing Stock
Primary Urban Center	168,342	57.06%
Ewa	15,301	5.19%
Central Oahu	39,115	13.26%
East Honolulu	15,972	5.41%
Koolaupoko	35,189	11.93%
Koolauloa	3,970	1.35%
North Shore	5,837	1.98%
Waianae	11,288	3.82%
Total	295,014	100.00%

Source: Planning Department, September 1994

Primary Urban Center - As illustrated in Exhibit V-4 above, the majority of the island's population is located in the Primary Urban Center (PUC). The PUC is a 65,028-acre sector and is the third largest of the eight planning regions in terms of geographic area.

Approximately 36% of the PUC was designated for urban uses in 1993. The majority of the developed area within this district consists of higher density housing structures. This region will continue to be popular with island residents due to its proximity to Honolulu's central business district. However, housing prices in the region continue to be pushed out of reach financially for more and more Oahu residents. This is a function of rapidly increasing land and housing prices associated with developing in the PUC.

Ewa - The subject property is located within the Ewa Development Plan area, which encompasses about eight percent of Oahu's land. The Ewa region has been designated as Oahu's second urban center to alleviate pressure for development within the Primary Urban Center and Central Oahu. As such:

- According to Oahu's General Plan, the highest proportion of the island's development potential is by policy being directed to the Ewa Development Plan Area over the next 25 years.
- The Ewa region will be differentiated from other large residential communities on Oahu because it also is planned as a major employment center rather than bedroom community or communities serving the primary urban center.

The Ewa Development Plan Area accounted for approximately five percent of Oahu's housing stock in 1993. The Ewa region is a study in the contrast between old and new from many perspectives, including housing. Aging plantation and beach communities stand in contrast to new master planned communities which offer a variety of homes in many price ranges.

The relatively high proportion of affordable housing planned for the Ewa area and expected pricing structure for new homes is expected to result in significant levels of medium density development in the region. High density, high rise-type construction such as that found in the Primary Urban Center is

not likely, however, due to regional urban design standards which include a height limit of 150 feet.

Central Oahu (H-1 corridor) - This region is Oahu's second largest planning district based on geographic area and concentration of housing units. Due to their proximity to the subject property along the western H-1 corridor, two active developments in the Central Oahu Development Plan Area have been included within the market study area: Waikele and Royal Kunia. Each is a golf course-oriented community and according to this analysis 1,590 units have been completed or 4% of the existing Central Oahu housing stock.

The majority of the Central Oahu district's lands are in preservation, agricultural and military uses. Government policies and actions have supported continued agricultural use of Central Oahu's "prime" agricultural lands. For example, the 2,100 acres of Galbraith Trust lands being exchanged for 500 acres of the subject parcel are located within Central Oahu and are intended to be preserved for agricultural use as state lands.

General Plan population policies are also likely to curtail the pace of residential growth in Central Oahu as future housing demand is directed to Ewa.

(2) Existing Supply within the Market Study Area	17,000 units (6/30/93)
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The most important segment of supply is that which exists in the competitive market study area, defined as the master planned communities in the Ewa Development Plan area plus H-1 corridor projects of Waikele and Royal Kunia.

The Planning Department estimated that in June 1993 there were approximately 16,891 residential units within the designated market study area, including existing

neighborhoods and new home sales. The existing stock includes homes already sold within competitive projects such as:

- Ewa by Gentry
- Villages of Kapolei
- Makakilo
- West Loch Estates (in final phase)
- Royal Kunia
- Waikele

The breakdown of existing housing stock within the market study area is shown on the following page in Exhibit V-5, *Distribution of Housing Stock by Market Study Area (1993)*.

Exhibit V-5
East Kapolei Project

Distribution of Housing Stock by Market Study Area (1993)

	Existing Housing Stock as of June 30, 1993	Share of Oahu Market
Ewa Development Plan Area	15,301	5.19%
Waikele (Traffic Analysis Zones 148.02, 148.03)	1,005	0.34%
Royal Kunia (Traffic Analysis Zones 146.01, 150.01)	585	0.20%
Total Market Study Area	16,891	5.73%
Total Oahu	295,014	100.00%

Source: Planning Department (August 1994)

**(3) Additions to Supply within
the Market Study Area**

34,000 units

Projects which will be actively selling residential product within the market study area at the time the subject property is targeted for development must be considered in the analysis of supply and demand. These include:

- City of Kapolei
- Ewa by Gentry
- Ewa Marina
- Ewa Villages
- Villages of Kapolei
- Ko Olina
- Makakilo
- Makaiwa Hills
- Royal Kunia
- Waikele
- West Loch (will be completed prior to subject development)

A descriptive summary of the history and future plans for these major future additions to supply (projects of over 1,000 units) is presented in Appendix A, *Competitive Product*.

Estimations of future supply are shown the following table, Exhibit V-6, *Additions to Residential Supply - Market Study Area, 1994 - 2010*. It should be noted that the development schedule presented in Exhibit V-3 is only a general indicator of the timing of these planned projects. This is based on the "build-out" schedule which the developers have provided to the Planning Department and a review of the source information for tables which indicates that projects often slip on timing or are not built at all.

East Kapolei Project
Market Assessment

Exhibit V-6, East Kapolei Project
Additions to Residential Supply - Market Study Area, 1994 - 2010

Project	Area	Total Units in Project ¹	7/1/93-6/30/94	1995	1996-2000	2001-2005	2006-2010
City of Kapolei							
Makai	Ewa	2,000			500	1,000	500
Mauka	Ewa	750			250	500	
Ewa by Gentry	Ewa	5,622	503	1,069	4,050		
Ewa Marina	Ewa	4,850			2,109	2,335	406
Ewa Villages	Ewa	1,716		113	1,603		
Ewa Fairways	Ewa	1,300			360	720	220
Kapolei Knolls	Ewa	380			380		
Ko Olina, Phase 1 ²	Ewa	2,500		280	Remainder of schedule unknown		
Ko Olina, Phase 2 ³	Ewa	0		Delayed Indefinitely			
Makaiwa Hills ⁴	Ewa	2,130				1,000	1,130
Makakilo							
Post 1986 phases	Ewa	1,707	10	102	1,096	499	
Makakilo Hts. (Palailai)	Ewa	404	69	136	199		
Makakilo Hts. (Schuler)	Ewa	550	148	172	230		
Royal Kunia - Ph 1	Central	1,748		350	1,398		
Royal Kunia - Ph 2	Central	2,000			1,400	600	
Villages of Kapolei	Ewa	4,464	311	993	2,211	949	
Waikele	Central	1,530	532	578	420		
West Loch	Ewa	503	328	175			
Total Future		34,154	1,901	3,968	16,206	7,603	2,256
Total Future Units to be Constructed		34,154					
¹ Total units 7/1/93 - 2010							
² Planning Department estimate based on Land Use Model and current observations							
³ Phase 2 Ko Olina "delayed indefinitely" per Planning Department, September 1994							
⁴ Planning Dept. estimate of units based on Land Use Model; consultant estimate of timing							
Sources: Development Plan Annual Report, Fiscal Year 1994, Tables III-d and III-e							

Ko Olina Assumptions. Due to inconsistencies in the developer's reporting, it was necessary for the consultant to make certain assumptions regarding the Ko Olina project.

- The Development Plan (DP) Annual Report, Fiscal Year 1994, published developer-provided construction schedules which indicate that Ko Olina residential component has been "delayed indefinitely," apparently due to the developer's failure to respond to the Planning Department's annual survey of construction.
- Subsequent discussions with Planning Department staff indicate that based on the department's Land Use Model and recent observations, a reasonable estimate for Ko Olina appears to be approximately 2,500 units before the year 2010, this compared to the 8,700 reported in last year's survey and the zero showing in the Development Plan Annual Report, FY 1994.
- According to conversations with the developer, 280 units are planned for construction in 1994.

Makaiwa Hills Assumptions. Exhibit V-6 reflects a total of 2,130 units for Makaiwa Hills by the year 2010, which is the estimate used in the Planning Department's Land Use Model. This estimate is utilized in the analysis of future supply rather than the 1,066 units reflected in the Development Plan Annual Report, Fiscal Year 1994. The latter estimate was based on a Committee Report reflecting Development Plan Amendment approval of 305 acres and 1,066 units. The 2,130 unit figure used in the Land Use Model and this analysis is more reflective of the probable density of the approved acreage (approximately 7 units per acre versus 3 per acre reflected by 1,066 units).

Government Projects - The Planning Department recognizes a number of housing developments as being sponsored by government. These include:

- **City Projects:** Ewa Villages, West Loch Estates, and Ewa Fairways, sponsored by the City and County of Honolulu; and

- **State of Hawaii Projects:** Villages of Kapolei, sponsored by the State of Hawaii's Housing Finance and Development Corporation;
- **Federal Projects:** An on-base, multi-family residential project of 120 units in the portion of Barbers Point Naval Air Station, which is to be retained for Department of Defense use following the planned base closure.

The government projects listed above were included in the estimation of future residential supply presented in Exhibit V-6 above, with the exception of Barbers Point. Planning Department staff advised against including this project in future supply as it was not intended to serve the local residential market.

Projects Approved by the Land Use Commission - In addition to reviewing advanced information on the projects included in future supply as reported to the City's Planning Department, the consultant reviewed the files of developments which have been submitted to the State Land Use Commission (LUC). The finding was that the majority of master planned communities presented as additions to future supply have received prior approval on the state level from the Land Use Commission, as shown in Exhibit V-7, *Land Use Commission Approvals*.

Exhibit V-7
East Kapolei Project

Land Use Commission Approvals

Project	Date of Approval	Docket No.	Acres
City of Kapolei Phase I	June 29, 1988	87-613	135
City of Kapolei Phase II	June 17, 1993	87-613	586
Ewa by Gentry	Year of 1974	N/A	331
Ewa by Gentry	May 8, 1989	88-627	673
Ewa Marina	October 17, 1990	89-651	403
Kapolei Knolls	November 20, 1989	88-628	77
Ko Olina, Phase 1	September 12, 1985	83-562	642
Ko Olina, Phase 2	February 14, 1991	90-655	372
Makaiwa Hills	October 28, 1993	92-687	1,700
Royal Kunia Phase 1	October 24, 1986	86-600	547
Royal Kunia Phase 2	December 9, 1993	92-683	504
Villages of Kapolei	August 23, 1988	88-622	830
Waikele	February 28, 1986	85-594	577
West Loch Estates	April 15, 1988	87-616	212

The acreage approved by the Land Use Commission suggests that for projects such as Makaiwa Hills, additional units beyond those shown in the Planning Department's construction estimates may be expected in some future period. In the absence of further specificity, the Planning Department's Land Use Model estimate Makaiwa Hills (2,130 units by 2010) was used to reflect the future for the purposes of this assessment.

Unadjusted supply. The unadjusted estimate of total supply for the market study area in the year 2010 is 51,045 units, as shown in Exhibit V-8, *Supply Summary, 1994-2010*.

Exhibit V-8, East Kapolei Project, Supply Summary, 1994 - 2010

Project	Area	Total Units in Project ¹	7/1/93-6/30/94	1995	1996-2000	2001-2005	2006-2010
Existing (6/30/93)		16,891					
City of Kapolei							
Makai	Ewa	2,000			500	1,000	500
Mauka	Ewa	750			250	500	
Ewa by Gentry	Ewa	5,622	503	1,069	4,050		
Ewa Marina	Ewa	4,850			2,109	2,335	406
Ewa Villages	Ewa	1,716		113	1,603		
Ewa Fairways	Ewa	1,300			360	720	220
Kapolei Knolls	Ewa	380			380		
Ko Olina, Phase 1 ²	Ewa	2,500		280	Schedule unknown		
Ko Olina, Phase 2 ³	Ewa	0		Remainder Delayed Indefinitely			
Makaiwa Hills ⁴	Ewa	2,130				1,000	1,130
Makakilo							
Post 1986 phases	Ewa	1,707	10	102	1,096	499	
Makakilo Hts. (Palailai)	Ewa	404	69	136	199		
Makakilo Hts. (Schuler)	Ewa	550	148	172	230		
Royal Kunia - Ph 1	Central	1,748		350	1,398		
Royal Kunia - Ph 2	Central	2,000			1,400	600	
Villages of Kapolei	Ewa	4,464	311	993	2,211	949	
Waikele	Central	1,530	532	578	420		
West Loch	Ewa	503	328	175			
Total Future		34,154	1,901	3,968	16,206	7,603	2,256
Total Future Additions¹		34,154					
Existing Stock		16,891					
Total Unadjusted Supply		51,045					
¹ Total units 7/1/93 - 2010							
² Planning Department estimate based on Land Use Model and current observations							
³ Phase 2 Ko Olina "delayed indefinitely" per Planning Department, September 1994							
⁴ Land Use Model estimate of units; consultant estimate of timing							
Sources: Future: Development Plan Annual Report, Fiscal Year 1994, Tables III-d and III-e (obtained pre-publication from Planning Department); Existing stock: Planning Department							

(4) Adjustments to Supply

Adjustments to future supply calculations were necessary to ensure that the analysis conforms to the most likely future conditions. These included (a) an adjustment for timing which is caused by projects not meeting their intended development schedules and (b) allowance for the occupancy of resort area residential units by non-residents.

(a) Adjustment for Timing of Additions (5,000) units to Supply

In practice the construction of units included in future additions to supply may not occur according to planned development schedules. In fact, history has shown this to be consistently true. Delay can result from a variety of factors, including:

- **Timing of construction vs. schedule.** Over the past several years, the projects of Ko Olina, Ewa by Gentry, Ewa Marina, and Royal Kunia each have experienced difficulties in meeting the schedules published in the Planning Department's Development Plan Annual Report. If these developer-provided construction schedules were taken at face value with no analysis or adjustment, there could be a danger of disapproving viable projects.
- **Recent market conditions.** Recent upturns in interest rates, the recession in Hawaii and cyclical downturn in the residential market probably have accounted for some delays. Scarce investment capital for developer financing also has been a factor. Several projects reflected in the estimate of unadjusted future supply have fallen prey to these conditions.
- **Delays in the provision of needed infrastructure.** In a situation where so much new infrastructure is required, delays in government financing of off-site improvements can delay housing construction. Although this situation is clearly beyond the control of the developer, it still results in construction delays and affects the timing of future residential supply.

Committed versus Proposed Residential Units. There is an important distinction between the level of "committed" versus "proposed" projects. The Planning Department categorizes new development using the following definitions:

Committed projects are considered certain to occur, because they are either under construction, have building permits in place, or are government projects whose completion is assumed. They are directly assigned to the location specified based on the schedule provided, subject only to the condition of not exceeding islandwide demand.

Proposed projects are not considered certain. They consist of projects with known characteristics and schedules as given by developers. Their completion is dependent on the interaction between supply and demand factors.

Source: Forecast of Population, Housing and Employment on Oahu by Small Area 1990 - 2010, Planning Department, 1993.

Figure V-9, *Housing Units Committed Versus Proposed: Market Study Area*, indicates that in September 1993 only 21 percent of the future supply in the primary competitive area was "committed." The implication is that nearly four-fifths of the additions to future supply reflects the characteristics and schedules proposed by developers, which are by no means assured.

East Kapolei Project
Market Assessment

Exhibit V-9
East Kapolei Project

Housing Units Committed versus Proposed: Market Study Area

Project Name	Proposed ¹	Committed ²	Total proposed or committed	Percent Committed
Ewa				
Ewa by Gentry	6,364	0	6,364	0%
Ewa Marina	4,800	0	4,800	0%
Ewa Villages	120	0	120	0%
Kapolei Knolls	475	0	475	0%
City of Kapolei (makai)	2,299	0	2,299	0%
City of Kapolei (mauka)	1,044	0	1,044	0%
Villages of Kapolei	0	5,004	5,004	100%
Ko Olina	9,509	0	9,509	0%
Makakilo	961	404	1,365	30%
Makaiwa Hills ³	0	0	0	0%
Central Oahu				
Waikele	1,268	1,915	3,183	60%
Royal Kunia	2,452	252	2,704	9%
Total	29,292	7,575	36,867	21%
¹ "Proposed projects" are not considered certain but have known characteristics and schedules ² "Committed projects" are assumed "certain to occur" by the City and County of Honolulu Sources: For definitions: Forecast of Population, Housing and Employment on Oahu by Small Area, 1990-2010, Planning Department, 1993; For estimates: "Proposed and Committed Projects Beyond 1990 by DP Area," Planning Department, September 1993) ³ Makaiwa Hills was excluded from the source of 1993 estimates due to timing				

Construction Timing Conclusion. As indicated previously, the additions to supply which are published by the Planning Department reflect both committed and proposed projects. In 1993 only 22 percent of the major study area project units were committed (Exhibit V-9, *Committed versus Proposed Projects*). Further, the experience of the past few years has been that several major developers have fallen behind their intended production schedules. Lastly, recent increases in long-term interest rates may affect the ability of residential product to be

sold over the next few years, causing a further extension of project schedules.

Based on the above assessment of timing, an estimate of 15 percent slippage in project build-out schedules has been assumed. This assumption is reflected as a deduction from additions to supply expected in the year 2010 based on habitual delays in actual development as compared to the schedules reported by developers. This deduction for timing is further supported by Exhibit V-9 which indicates that nearly four out of every five the units reflected in the additions to supply is considered "proposed" as opposed to "committed."

**(b) Adjustment for Non-Resident
Occupancy** *(1,470) units*

Two of the major projects within the study area have been planned as both resort and residential communities -- Ko Olina and Ewa Marina. As a part of this analysis property managers at similar projects were interviewed. They indicated that over time residentially-zoned units near resorts are prone to be removed from local-serving residential supply for at least two reasons:

- (1) Units are purchased by non-residents and left vacant, and/or
- (2) "Residential" units are absorbed by visitors via long-term rentals and therefore are unavailable to local residents. In one situation, a source estimated that over time at least 80 percent of residential units in resort communities no longer serve the local market after the first two to three years.

Based on the foregoing assessments, an adjustment of 20 percent or 1,470 future units planned for the resort-oriented communities of Ewa Marina and Ko Olina has been assumed. This deduction from future supply is used to reflect the absorption of units by non-residents. This appears to be conservative, based on interviews with property managers indicating up to 80 percent of units being effectively removed

from local residential supply due to non-resident occupancy in comparable situations.

(5) Calculation of Supply

Total adjusted supply for the market study area is estimated at 44,452 units by 2010, including 16,891 existing units. Exhibit V-10, *Calculation of Supply, 1994-2010*, summarizes the foregoing discussion.

**Exhibit V-10
East Kapolei Project**

**Calculation of Supply
1994 - 2010**

	Units	Notes
Existing Housing Inventory - Study Area	16,891	Refer to Step 2; Exhibit V-5
Additions to Future Supply	34,154	Refer to Step 3; Exhibit V-6
Deduction for Timing of Additions to Future Supply (15%)	-5,123	Refer to Step 4(a)
Deduction for Non-Resident Occupancy	-1,470	Refer to Step 4(b)
Adjusted Supply for the Year 2010 - Market Study Area	44,452	

SUPPLY AND DEMAND CALCULATION

Exhibit V-11, *Supply and Demand Summary*, presents the estimated supply and demand relationship for the market study area.

Based on these calculations it would appear that adequate demand would exist for residential development on the subject property. These conclusions were confirmed by interviews in the local community and with developers and real estate agents active in the Oahu residential market.

Exhibit V-11
East Kapolei Project

Supply and Demand Summary

	Low	Midpoint	High	
Demand Calculation				
1 Unadjusted Study Area Demand	52,661	55,068	57,474	Refer to Exhibit V-3
2 Adjustment for University of Hawaii at W. Oahu	300	300	300	Refer to Exhibit V-3
3 Total Adjusted Demand - Market Study Area	52,961	55,368	57,774	Includes 16,891 existing units
Supply Calculation				
4 Existing Inventory - Study Area	16,891	16,891	16,891	Refer to Exhibit V-5
5 Additions to future supply	34,154	34,154	34,154	Refer to Exhibit V-6
6 Deduction for Timing of Additions to Future Supply (15%)	-5,123	-5,123	-5,123	Consultant estimate
7 Deduction for Non-Resident Occupancy	-1,470	-1,470	-1,470	Consultant estimate (applies only to Ewa Marina and Ko Olina)
8 Adjusted Supply for the Year 2010 - Market Study Area	44,452	44,452	44,452	Includes existing units (Line 4)
Conclusions				
9 Total Market Study Area Demand (1994-2010)	52,961	55,368	57,774	Line 3
10 Total Market Study Area Supply (1994-2010)	44,452	44,452	44,452	Line 8
11 Estimated Shortfall - Market Study Area (1994-2010)	8,509	10,916	13,322	Line 3 less Line 8
12 Additional demand - Market Study Area (1994-2010)	36,070	38,477	40,883	Total demand (Line 3) less existing (Line 4)
13 Additional demand - Ewa Development Plan Area Only (1994-2010)	28,856	30,782	32,706	Excludes Royal Kunia, Waikele and existing units

MARKET POSITION

Product Survey

The first step in determining the potential market performance of the subject property was to survey products in master planned communities offered for sale in the competitive study area. The projects were surveyed as a guideline for evaluating the product sizing, pricing and absorption proposed by the developer, Schuler Homes, Inc.

Once the existing products were identified and surveyed, a list of comparable products was prepared for the proposed East Kapolei Project. These comparables served as guidelines for potential products which could be developed in the subject project's subdivisions and indicators of their potential performance.

Exhibit V-12, *Existing Residential Products, 1994* on the following page provides an overview of subdivisions which are currently active or have recently been completed within the market study area.

**East Kapolei Project
Market Assessment**

Exhibit V-12, East Kapolei Project, Existing Residential Products, 1994

Master Planned Community Subdivision	Developer	Area	Type	Number	Monthly Absorp.*	Living Area (sq ft)			\$(1000s)		
						Min	Max	Avg	Min	Max	Avg
Ewa by Gentry											
Sun Terra on the Park (market)	Gentry	Ewa	SFD	184	13	945	1671	1308	259	310	285
Sun Terra South (market)	Gentry	Ewa	SFD	72	18	945	1671	1308	259	310	285
Summerhill (gap) ¹	Gentry	Ewa	SFD	305 (R)	N/A	1055	1648	1352	245	295	270
Coronado (affordable) ²	Gentry	Ewa	SFA	138	Lottery	407	710	559	90	150	120
Currently offered - total project				699	31						
Villages of Kapolei											
Malanai (market)	HFDC	Ewa	SFD	327	11	1730	2248	1989	280	350	315
Malanai Iki (affordable)	HFDC	Ewa	SFA	88	Lottery	1118	1266	1192	96	130	113
Kekuilani (market)	HFDC	Ewa	SFA/D	472	32	915	1510	1213	270	282	276
Kekuilani (affordable)	HFDC	Ewa	SFA/D	472	Lottery	800	1800	1300	99	177	138
Aiealoa market	HFDC	Ewa	SFD	120	12	1118	1430	1274	275	398	337
Aiealoa affordable	HFDC	Ewa	SFA/D	203	Lottery				190	230	210
Currently offered - total project				1682	55						
West Loch											
Fairway Masters	Zane	Ewa	SFD	43	7	1420	2072	1746	388	438	413
Currently offered - total project				43	7						
Makakilo											
West Hills	Fin. Realty	Ewa	SFD	96	10	1394	1787	1591	326	393	360
Royal Ridge	Fin. Realty	Ewa	SFD	48	1	1370	1818	1594	376	404	390
Westview	Schuler	Ewa	SFA	148	12	750	980	865	183	212	198
Currently offered - total project				292	23						
Royal Kunia											
Phase I - SFD	CCHH	Central	SFD	146	146(R)	800	2051	1426	250	400	325
Phase I - SFA (affordable)	CCHH	Central	SFA	248	lottery	770	1000	885	183	205	194
Currently offered - total project				394	N/A						
Waikale											
ParkGlen	Schuler	Central	SFA	204	20	796	918	857	229	239	234
Highlands	Schuler	Central	SFA	118	26	829	965	897	198	244	221
Royal Pines	Schuler	Central	SFD	126	24	1183	1664	1425	309	325	317
Signature	Schuler	Central	SFD	67	20	1329	1663	1496	356	437	397
Champions	Schuler	Central	SFD	117	9	1336	1664	1500	355	445	400
Currently offered - total project				632	99						

SFA= single family attached; SFD= single family detached; CCH = Castle & Cooke Homes Hawaii; Fin. Realty= Finance Realty
 HFDC=Housing Finance and Development Corporation; R=reservations; * based on realtor interviews
¹ Summerhill has been on the market for two months and all units are reserved; ² Excludes an additional 118 affordable rental units

Profile of Target Markets

As part of this analysis, a written survey regarding target markets was conducted among real estate agents currently selling residential products within the market study area. Based on information provided by the developer concerning the range of products to be offered at the subject property, the target markets for the proposed project are expected to be as shown in Exhibit V-13, *Profile of Target Markets*:

Exhibit V-13
East Kapolei Project

Profile of Target Markets

Residential Product	Age Range	Ownership History
Multifamily		
Affordable	All	First time
Gap	25-45	First time and move up
Market	25-45	Move up
Single Family	30-40	Move up

Residential Pricing Overview

The proposed community is anticipated to be developed in conformance with draft guidelines for development agreements between the City and County of Honolulu and residential developers. These draft *Rules for Unilateral Agreements Requiring Affordable Housing* are dated August 1994 by the Department of Housing and Community Development. They currently provide for 30 percent of a development's housing component to be affordable and the remainder to be offered at market rates.

Prices for affordable and market-priced homes within the subject property were calculated by the East Kapolei Project's developer, Schuler Homes, Inc. Based on a comparison with

prices in competitive communities, they appear to be reasonable.

Affordable Product Pricing

For the purpose of this analysis, affordable residential product is defined as those new homes which are priced to meet the financial qualifications of families whose incomes are up to 120 percent of the Oahu median, which in 1994 is assumed to be \$53,000 for a family of four.

Divisions within the Affordable Category. In order to comply with City and County's draft unilateral agreement guidelines, the project's developer will make two divisions within the affordable product in the proposed development.

Ten percent of the development's product will be priced for families with income levels up to 80 percent of Oahu's median.

An additional twenty percent of the product will be priced to accommodate families in the 81-120 percent of median income brackets.

Pricing Assumptions. Draft pricing assumptions for unilateral agreements entered into by the City and County include:

1. A ten percent down payment.
2. Interest rate: one-year average of thirty-year U.S. Treasury bills plus one-half percent (currently calculated at 7.5 percent using this guideline).
3. If the developer secures lower interest rates than the above, the developer must adjust prices accordingly.
4. Thirty-three percent (33%) of the purchaser's gross monthly income allocated for housing payments (principal, interest, real property taxes, insurance, etc.).

**East Kapolei Project
Market Assessment**

(Source: Summary, Unilateral Agreements: Affordable Housing Rules [Draft], City and County of Honolulu, August 1994)

The developer's pricing is slightly more conservative. In addition to the above guidelines, Schuler Homes, Inc. has provided for an allowance of \$200 per month above the 33 percent of income requirement. This extra allowance could be used to cover maintenance or community association dues for multifamily units. A minimum of two bedrooms per unit is also assumed by the developer for the affordable product.

Exhibit V-14, *Affordable Pricing Structure* shows the developer's assumed pricing of affordable product based on the guidelines discussed above for the East Kapolei Project. Prices are presented in 1994 dollars.

**Exhibit V-14
East Kapolei Project**

Affordable Pricing Structure

Family Size		2	3	4	5	6	7	8
Percent of Median Annual Income	80%	\$33,920	\$38,160	\$42,400	\$45,792	\$49,184	\$52,576	\$55,968
Home Prices		\$116,448	\$134,977	\$153,506	\$168,329	\$183,152	\$197,975	\$212,798
Percent of Median Annual Income	100%	\$42,400	\$47,700	\$53,000	\$57,240	\$61,480	\$65,720	\$69,960
Home Prices		\$153,506	\$176,666	\$199,827	\$218,356	\$236,885	\$255,414	\$273,942
Percent of Median Annual Income	120%	\$50,880	\$57,240	\$63,600	\$68,688	\$73,776	\$78,864	\$83,952
Home Prices		\$190,563	\$218,356	\$246,149	\$268,384	\$290,618	\$312,853	\$335,087
Source: Schuler Homes, Inc. Assumes mortgage rate of 7.5%								

Market-Priced Product Pricing

Four types of market-priced residential units are planned for the subject property:

- *Single family homes* with an average of 1,500 square feet of living area, an average price of \$285,000 and average density of 7 units per acre.

- *Townhomes* with an average of 1,200 square feet, an average price of \$235,000 and density of 11 units per acre.
- *Low density multifamily homes* with 800-900 square feet, at \$208,000 and constructed at a density of 15 units per acre.
- *Medium density multifamily homes* with 800 square feet, at \$185,000 and density of 20 units per acre.

These products are included for illustrative purposes; actual products developed could vary significantly. These variances could be caused by a change in consumer style preferences and/or unforeseeable changes in the economic, market and financial conditions in the market area. All prices are expressed in 1994 dollars with no adjustment for inflation.

ABSORPTION

Once the product types and target markets were identified for each of the neighborhood areas, a potential absorption schedule was prepared using the following assumptions:

- At least four different residential product types would be active at a time.
- As each product type is built out it would be replaced with a similar product.

The schedule for Phases I and II has been provided by the developer, Schuler Homes, Inc. The hypothetical absorption was based on both quantitative and qualitative factors presented in the following sections.

Quantitative factors. Analysis of potential absorption considered:

- Research of products which have been on the market for extended periods including Ewa developments presented above in Exhibit V-11;
- A cross-check of the overall sales rates of comparable master planned communities for the past six years obtained from Prudential Locations, Inc.; and
- Historical Oahu sales and construction performance of the subject project's developer, Schuler Homes, Inc.
- The build up and decline of sales velocity at the beginning and end of phases within a master planned community.

Qualitative Factors. Exhibit V-15, *Qualitative Evaluation*, provides an overall ranking of the East Kapolei Project vis-a-vis competitive developments. Factors evaluated include access to the property, views, neighborhood ambiance, on-site amenities and the diversity of home design choices offered.

Exhibit V-15
East Kapolei Project

Qualitative Evaluation: East Kapolei Project vs. Competitive Master
Planned Communities

Community	Access	Views	Neighborhood	Amenities	Design Choices	Overall Ranking
Ewa by Gentry	Similar	Similar	Slightly superior	Similar	Inferior	Slightly inferior
Makakilo	Inferior	Far superior	Similar	Similar	Slightly superior	Similar
Royal Kunia	Superior	Superior	Similar	Superior	Superior	Superior
Villages of Kapolei	Slightly superior	Similar	Slightly superior	Superior	Similar	Slightly superior
Waikele	Superior	Superior	Superior	Far superior	Similar	Superior
West Loch	Similar	Superior	Similar	Slightly superior	Similar	Slightly superior

Comparison to Ewa projects. The subject development is likely to compare with other Ewa-area master planned communities as follows:

- The Ewa by Gentry project is expected to be particularly competitive with the proposed development. This assessment is based on its similarity to the subject parcel in terms of location, topography, climate and target markets. However, based on the previous analysis, the subject development may sell at a slight premium vis-a-vis the Ewa by Gentry project based on the greater diversity of product expected within the subject development.

- The Villages of Kapolei project also resembles the proposed development by virtue of its affordable component and diversity of product types. It is expected to offer similar retail amenities, but its golf course could cause the Villages of Kapolei to sell at a slight premium vis-a-vis the subject development.
- Additional competition is expected from single family and multifamily components of the Makakilo development. This development is qualitatively ranked "similar" to the East Kapolei Project.
- Although it is still actively selling, West Loch Estates is planned to be built-out before the subject property could commence.

Comparison to Waikele and Royal Kunia. The Central Oahu community of Waikele is likely to continue to outsell all current competitors within the market study area. It also is likely to outsell the subject property in the future. This is due to its favorable location, topography, views and exceptional amenities, including the Waikele Power Center retail complex and golf course.

Royal Kunia is likely to sell at a premium vis-a-vis the subject as well. This is due to its topography, climate, access to H-1 freeway, views and on-site amenities.

Hypothetical Absorption Schedule

Exhibit V-16, *Hypothetical Absorption Schedule*, presents an absorption schedule based on the timing and absorption assumptions discussed above. Several caveats must be presented with regard to the hypothetical absorption schedule:

- The schedule represents only one of many potential scenarios which could actually occur.

- The actual schedule may differ significantly based on future market or financial conditions.
- The hypothetical absorption schedule reflects only market-related factors and does not account for soil conditions, financial optimization or engineering factors.

The schedule which follows is intended to reflect the build up and decline of absorption during the beginning and end of phases. This cycle of activity is typical in the construction of master planned communities.

**Exhibit V-16
East Kapolei Project**

Hypothetical Absorption Schedule

Product Type - Target Market	Density (units/ac)	Number of Units	Avg Price (\$000)	Absorp per mo ¹	Absorp per yr	1997	1998	1999	2000	2001	2002	2003	2004	2005		2006		2007		2008		2009		2010		2011		Total
						Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Yr20	Yr21	Yr22	
Single Family - Market	7	2,590	\$285,000	13	156	120	195	195	195	195	195	195	195	5	1295	115	195	195	195	195	195	195	195	195	195	205	1295	
Townhome - Market	11	1,810	\$235,000	9	108	75	135	135	135	135	135	135	135	20	905	95	135	135	135	135	135	135	135	135	135	135	905	
Low Density - Market	15	2,400	\$208,000	25	300	90	180	180	180	180	180	180	180	30	1200	120	180	180	180	180	180	180	180	180	180	180	1200	
Medium Density - Market	20	200	\$185,000	2	24	5	15	15	15	15	15	15	15	5	100	20	15	15	15	15	15	15	15	15	15	5	100	
Medium Density - Affordable																												
Up to 80% of median	20	1,000	\$133,000	3	36	35	75	75	75	75	75	75	75	15	500	50	75	75	75	75	75	75	75	75	75	75	500	
Up to 120% of median	20	2,000	\$175,000	6	72	75	150	150	150	150	150	150	150	25	1000	100	150	150	150	150	150	150	150	150	150	150	1000	
		10,000				400	750	750	750	750	750	750	750	100	5000	500	750	750	750	750	750	750	750	750	750	750	5000	

¹ average monthly absorption = total per product/96 mo. in phase 1

RESIDENTIAL CONCLUSION

Average Annual Absorption. Based on the estimated 15-year sell out of the 10,000 residential units in the proposed development (which includes 9,250 units before 2010), an average annual absorption rate of between 600 and 700 units appears to be reasonable. This estimate compares favorably with the experience of other communities and with the developer's assessment of annual sales potential.

Anticipated Capture Rates - Market Study Area. In order to assess the subject development's potential to capture future residential demand, a comparative analysis was conducted using five-year sales performance of comparable master planned communities within the market study area (raw data source: Prudential Locations, Inc.). Projects included in this analysis included Ewa by Gentry, Makakilo, Waikele and West Loch Estates. The results of this investigation showed average project capture rates during active sales periods ranging from approximately 15 percent of new home sales within the market study area to approximately 44 percent.

The subject property's estimated capture rates for future housing demand in the market study area are estimated to range between 20 and 30 percent per year. Based on the capture rates of comparable developments (15 to 44 percent), the range of capture rates assumed for the proposed development appears to be conservative.

As shown below in Exhibit V-17, *Capture Rates for Future Demand*, a capture rate of 25% of the market study area would indicate sales of 9,510 units at the midpoint of population projections. This compares favorably to the 9,250 units proposed within the subject property by the year 2010.

Exhibit V-17
East Kapolei Project, Capture Rates of Future Demand

	Low Point	Midpoint	High Point
Study area future demand (market study area demand less existing supply)	36,070	38,477	40,883
Study area capture rate @ 20%	7,214	7,695	8,177
Study area capture rate @ 25%	9,018	9,619	10,221
Study area capture rate @ 30%	10,821	11,543	12,265

Anticipated Capture Rates - Total Oahu Demand. The estimated capture rate for the subject property falls within the 12 to 14 percent range of the total Oahu demand for new housing units in 2010.

Section VI

RETAIL

INTRODUCTION

Projects of the size proposed for the subject property often require a retail component. The current draft site plan provides for the location of several retail uses within the proposed community. (To view this map, see Exhibit III-1, *East Kapolei Project - Location Map* located on page III-3.)

Organization of this Section. This section defines the retail trade area for potential neighborhood retail services located on the subject property. Further, it reviews current and future supply and demand conditions and outlines in general terms the possible retail tenants which could be located in retail facilities should they be developed on the subject property.

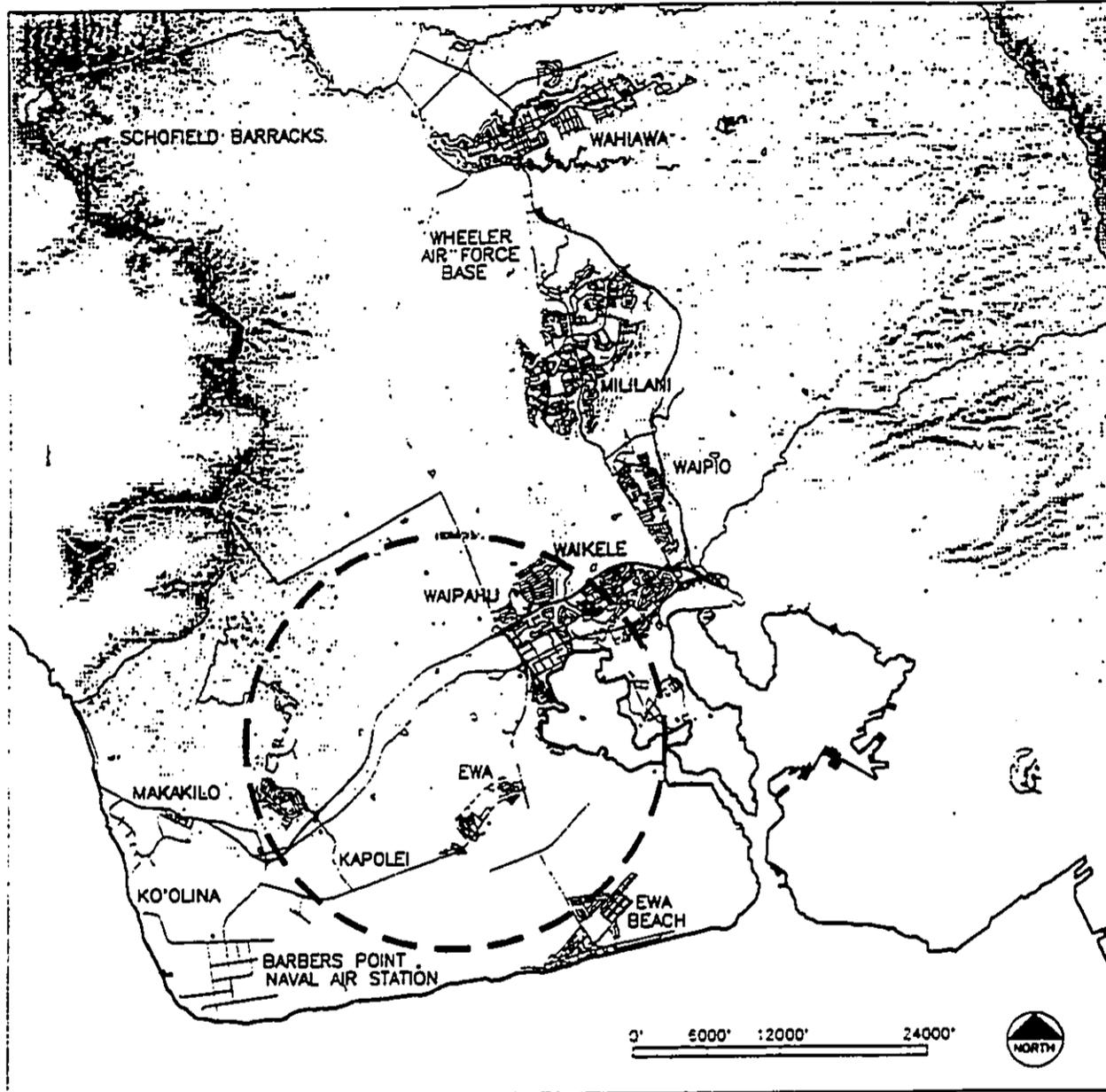
RETAIL TRADE AREA DEFINITION

The trade area for neighborhood commercial uses proposed for the subject property was defined as a three-mile radius from the center of the parcel. Exhibit VI-1, *East Kapolei Project: Retail Trade Area* illustrates this area. It includes all or a part of the following communities:

- Ewa Villages
- Ewa by Gentry
- Royal Kunia
- Villages of Kapolei
- West Loch Estates
- Naval Air Station, Barbers Point (NASBP) (portion)
- Makakilo (portion)
- City of Kapolei (portion)

Although only portions of West Loch, NASBP, Makakilo and the City of Kapolei are considered within the trade area, all proposed housing units for those areas were included in the analysis.

Exhibit VI-1
East Kapolei Project: Retail Trade Area



METHODOLOGY

The calculation of the need for support retail on the subject parcel is based on an analysis of the market forces of supply and demand. The analysis focuses purely on need for additional retail which is created by new housing.

- **Supply.** Estimation of supply is based on the existing and planned neighborhood shopping centers within the retail trade area. Existing supply is described for informational purposes.
- **Demand.** Future demand for neighborhood retail facilities within the subject parcel is based on growth in population within the retail trade area. It assumes that the existing population currently is having its needs met.

SUPPLY

Current Retail Supply

The existing supply of retail space within the defined trade area is quite limited, since its three-mile radius is largely undeveloped agricultural land or in residential use. The following retail establishments are currently doing business within the designated retail trade area and are presented for informational purposes:

- *The recently opened Kapolei Shopping Center, Phase I.* This center is located on the southern fringe of the retail trade area. This phase totals 140,000 square feet on 18.5 acres according to staff of The Estate of James Campbell.
- *The Ewa Villages neighborhood.* This older residential area has a few "mom and pop" convenience stores but no significant commercial area.
- *The town of Waipahu.* This area contains a mixture of commercial uses. Retail commercial in Waipahu which is

not associated with shopping center activity was excluded from relevant supply for the purpose of this analysis, as it is dissimilar to other competition. Only the expansion of the Waipahu Town Center was included in the estimate of future supply.

- *Makakilo strip center.* Currently there is limited retail for the convenience of local residents.

Additions to Retail Supply

Exhibit VI-2, *Existing and Future Retail Supply - Trade Area* provides a summary of the additional retail planned within the subject property's trade area. The existing projects are included as an illustration of the limited retail supply currently within the trade area.

Exhibit VI-2
East Kapolei Project

Existing and Future Retail Supply - Retail Trade Area

Shopping Center	Square Feet	Acres
Existing Supply (selected)		
Kapolei Shopping Center Phase I	140,000	18.5 (given)
Waipahu Town Center	160,000	11 (given)
Future Supply		
Kapolei Shopping Center Phase II	100,000	11.0 (given)
Kapolei Power Center Phase I	150,000 ¹	12.5 ¹ (given)
Phase II	75,000 ¹	6.9 ¹ (derived)
Kapolei Entertainment Center Restaurant Pads	12,000	1.5 acres ² (estimate)
Villages of Kapolei	Unknown	15 (estimate)
Laulani Retail Center	150,000	20 (given)
Commercial proposed by The Estate of James Campbell	230,000	27 acres ³ (given)
Additional Ewa by Gentry Commercial (tentative)	50,000	4.6 (derived)
Waipahu Town Center Expansion	80,000 ⁴ (given)	7.3 (derived)
Royal Kunia (Walmart and Times)	165,000 (derived)	15 acres (given)
Total Future Supply in Acres (Retail Trade Area)		121
<p>Sources for "given": The Estate of James Campbell, Waipahu Town Center, Royal Kunia. "Derived" consultant estimates based on a lot coverage ratio of 0.25 and 43,560 square feet per acre; ¹Indicates that actual has been discounted by 50 percent due to lack of direct competitiveness to subject retail; ²Total parcel is 8 acres. 1.5 acres represent three restaurant pads which are considered competitive with retail on the subject parcel. ³ Total parcel is 27 acres adjacent to subject parcel on Farrington Highway. ⁴Waipahu Town Center will not actually expand its acreage, but the 80,000 square feet of retail would capture demand. For this reason, it was converted into an estimate of relative acreage based on the calculation described above.</p>		

DEMAND

Demand for retail facilities located on the subject property will be a function of population growth and household formation which are translated into neighborhood shopping needs. Demand will be created by:

- Housing within the proposed development;
- Construction of the university campus across the North South Road from the project site; and
- Expansion of existing master planned communities within the retail trade area (particularly Ewa by Gentry, Villages of Kapolei, Ewa Villages and West Loch).

An estimation of the additional population expected within the trade area is shown in Exhibit VI-3, *Calculation of Additional Population to be Served*. This analysis indicates that approximately 107,000 additional persons will need to be served within the retail trade area by the year 2010.

Exhibit VI-3
East Kapolei Project

Calculation of Additional Population to be Served

Housing Units	1995	2,000	2,005	2,010
City of Kapolei - Makai		500	1,000	500
City of Kapolei - Mauka		250	500	
Ewa by Gentry	1,069	4,050		
Ewa Villages	113	1,603		
Ewa Fairways		360	720	220
Kapolei Knolls		380		
Makakilo	102	1,096	499	
	136	199		
	172	230		
NASBP	120			
Royal Kunia - Ph 1	350	1,398		
Royal Kunia - Ph 2		1,400	600	
Villages of Kapolei	993	2,211	949	
West Loch	175	1,200	3,000	3,000
Subject	0	2,650	2,850	3,750
Total	3,230	17,527	10,118	7,470
Cumulative Residential Units	3,230	20,757	30,875	38,345
Population (units x household size of 2.8)	9,044	58,120	86,450	107,366

**Calculation of Future Demand for Neighborhood
Retail**

The methodology shown in Exhibit VI-4, *Calculation of Future Demand*, was utilized to estimate demand for neighborhood commercial facilities within the retail trade area by the year 2010.

Exhibit VI-4
East Kapolei Project

Calculation of Future Demand

	1995	2000	2005	2010
Step 1: Additions to population of retail trade area Method: multiply additional future units by household size of 2.8 to estimate population for the years 1995, 2000, 2005 and 2010 Source for population: Exhibit VI-3	9,044	58,120	86,450	107,366
Step 2: Total sales for the retail trade area Method: multiply the population in Step 1 by a factor of dollars spent per person (\$11,463.24). Dollar estimate is based on a ratio of total 1992 retail sales by 1992 population of Oahu. Source of sales data: Urban Decision Systems, Inc. (UDS), 1992	100,446,101	645,498,363	960,146,551	1,192,447,595
Step 3: Total neighborhood retail sales in trade area Method: multiply total sales in Step 2 by the proportion of neighborhood-type retail sales to total sales. The percentage of neighborhood-type sales is then increased over time from a rural factor of 15% to a more urban factor of 30% to reflect urbanizing character of the retail trade area over time. Source of neighborhood to total sales: UDS	0.15	0.20	0.25	0.30
	15,066,915	129,099,673	240,036,638	357,734,279
Step 4: Supportable rural shopping center area (square feet) Method: divide the sales in Step 3 by a rule-of-thumb factor of \$200 per square foot of sales.	75,335	645,498	1,200,183	1,788,671
Step 5: Acreage needed for neighborhood commercial in retail trade area Method: Divide the supportable square feet in Step 4 by a lot coverage factor of 0.25 and divide by 43,560 square feet per acre. 164 acres represents total new demand for neighborhood retail within the retail trade area by the year 2010	7	59	110	164

SUPPLY AND DEMAND SUMMARY

As shown in Exhibit VI-5, *Supply and Demand Calculation*, the supply/demand calculation resulted in the conclusion that approximately 43 acres of neighborhood commercial could be

supported within the retail trade area. This would translate into a need of approximately 468,300 square feet of additional neighborhood commercial space within the retail trade area (based on lot coverage ratio of 0.25).

**Exhibit VI-5
Supply and Demand Calculation**

Calculation	Acres	Reference
Future Supply	121	Exhibit VI-2
Future Demand	164	Exhibit VI-4
Need/(oversupply)	43	

MARKET POSITION

Design Type: Neighborhood Center. It is expected that the commercial land uses on the subject property will be limited to neighborhood "support" retail, most likely a neighborhood shopping center. Such shopping centers typically include the following:

- Supermarkets
- Drug stores
- Restaurants and/or bars
- Apparel shops
- Dry cleaners

Additional retail outlets serving the needs of university faculty and students should also be viable. Such uses could include bookstores, photocopiers and coffee shops.

Deed Restriction. A deed restriction in the land exchange and purchase agreements entered into by Schuler Homes, Inc. and The Estate of James Campbell places a limit on commercial within the project area of two acres for every 1,000 residential units. This would mean that a total of twenty acres of

commercial acreage could be developed on the subject property.

- At a lot coverage ratio of 0.25, a neighborhood shopping center of approximately 218,000 square feet could be developed by 2010.
- As shown by the analysis above, the estimate of demand for an additional 468,300 square feet within the retail trade area is in well excess of this number.

Timing. Absorption of retail space on the subject property is assumed to be through the sale of a parcel to an unrelated developer. This sale would be expected to take place at the end of the project's development period, circa 2010.

RETAIL CONCLUSION

The proposed development appears to be well positioned to serve a variety of community retail needs. Tenants drawn to the subject property will primarily provide goods and services for its residents through neighborhood shopping center facilities to be developed at the end of the project's expected build-out in 2010-2011.

Appendix A
COMPETTIVE PRODUCT

Appendix A

COMPETITIVE PRODUCT

The following are descriptions of the history and current status of major competitive projects within the market study area and including over 1,000 units. Information is presented in the following order:

Description	Page
1. <i>The City of Kapolei</i>	A-1
2. <i>Ewa by Gentry</i>	A-2
3. <i>Ewa Marina</i>	A-3
4. <i>Ewa Villages</i>	A-4
5. <i>Ko Olina</i>	A-6
6. <i>Makakilo</i>	A-7
7. <i>Makaiwa Hills</i>	A-8
8. <i>Royal Kunia</i>	A-9
9. <i>Villages of Kapolei</i>	A-10
10. <i>Waikele</i>	A-12

The City of Kapolei

The City of Kapolei is part of a phased commercial development plan that is planned to include seven million square feet of office, government, commercial and light industrial space. The City is intended to be a self-contained community that will provide a living as well as working environment for its residents.

Phase I: A total of 135 acres has been rezoned to B-2 Community Business District for the development of the City of Kapolei. The 135 acres involved two petitions to re-zone: Ordinance 90-30 (92.7 acres) and Ordinance 91-65 (42.3 acres). The State Boundary Amendment for the 135-acre site was approved in 1988.

Phase II: The State Land Use Commission approved urbanization of the remaining 586 acres in the City of Kapolei in June 1993.

Source: City and County of Honolulu, Department of Land Utilization, Director's Report File 85/Z-21, Developer Interview (The Estate of James Campbell)

Ewa by Gentry

Ewa by Gentry is located three and one-half miles south of the H-1 freeway along Fort Weaver Road. This master planned community will encompass 1,005 acres for a total of 8,300 dwelling units. Residential construction began in 1988 with the Soda Creek project. At the time of the 1994 Development Plan Annual Report, an estimated 3,000 units had been completed. An additional 5,000 units is expected by the year 2000.

The master plan for the community of Ewa by Gentry includes an 18-hole golf course, an elementary school, two community parks and a neighborhood commercial center. This community includes both single- and multi-family homes, at affordable and market prices. The basic infrastructure necessary to sustain ongoing and future residential development has been constructed by the developer.

The project has received zone changes incrementally since 1985. Stipulations for affordable housing have varied, depending on the timing of the request for zone change. These requirements are outlined below.

Ordinance 84-94, 225 acres are rezoned, 2,465 units proposed:

- 10 percent at or below 80 percent of median income housing.

Ordinance 91-17, 224 acres rezoned, 2,835 units proposed:

- 10 percent at or below the 80 percent of median income housing;
- 20 percent at 80 to 120 percent of median income; and
- 30 percent at the 120 to 140 percent of median income range.

Ordinance 93-54, 11 acres rezoned, 322 units proposed:

- 10 percent at or below 80 percent of median income housing.

Ordinance 94-57, 486 acres rezoned, 1,480 units proposed:

- 10 percent at or below 80 percent of median income housing;
and
- 20 percent at 80 to 120 percent of median income.

Sources: City and County of Honolulu, 1993 Development Plan Review;
Department of Land Utilization, Director's Report File 93/Z-10

Ewa Marina

The Ewa Marina project is located in Ewa Beach and is accessible from H-1 via Fort Weaver Road. This 1,100-acre site has been master-planned as a mixed-use marina community. The project will have one mile of ocean frontage in the vicinity of the 30-acre Oneula Beach Park and includes plans for a 1,400-slip marina.

The Ewa Marina master plan calls for 4,850 residential units, 950 visitor units, specialty hotels, a 27-hole golf course, a health and fitness center, and a community-scale commercial project at the marina. Haseko (Ewa), Inc. is the developer.

The entire 1,100-acre site was designated for urban use by the City and County of Honolulu in 1993 and the State Land Use Commission in 1993. Final government approvals for the marina (Special Management Area and Conservation District Use permits) are pending. Upon substantial completion of the marina, residential construction is anticipated to begin. Full build-out is anticipated to require fifteen years.

The 1,100 acre project will be developed in two phases, with an estimated 2,000 units expected for completion by the end of the decade.

Phase I of the Ewa Marina project consists of an area containing approximately 707 acres, located between the Ewa Beach community and the Barbers Point Naval Air Station. It is planned to contain a mixture of uses, including residential, low

density apartment, medium density apartment, commercial, public facility (including the marina), park, and preservation (waterway and flood control areas). Stipulations on the residential units sold require that:

- 10 percent of the units sold or rented at 80 percent of the median income; and
- 20 percent of the units sold or rented at 80 to 120 percent of the median income.

Phase II is planned to consist of approximately 403 acres which includes a mixture of park/golf course, commercial-industrial mixed use and park uses. The 27-hole golf course with clubhouse and maintenance facilities is located on approximately 272 acres of land between Naval Air Station Barbers Point and Fort Weaver Road. The golf course will be integrated into the Ewa Marina residential community and will serve as a part of the Kaloi drainage system. Phase II also includes a mixed use commercial job center and visitor complex on approximately 114 acres of land between the golf course and the marina. This mixed use complex is planned to include 950 visitor accommodation and apartment units to complement the marina. A 17-acre gateway park will also be provided as a part of Ewa Marina Phase II.

Sources: City and County of Honolulu, Department of Land Utilization, Director's Report; Interview with developer (Haseko Hawaii).

Ewa Villages

The Ewa Villages area is an existing cluster of neighborhoods including Ewa, Renton, Fernandes and Tenney Villages. Access to the existing villages is through Fort Weaver Road to the east. Access to H-1 is through the Fort Weaver Road interchange.

The City and County of Honolulu, through its Department of Housing and Community Development (DHCD), has adopted plans for both revitalization and further development of the existing Ewa Villages. An 18-hole municipal golf course is

nearly complete, and will be followed by additional uses, including:

- Revitalization of 273 existing homes;
- 957 additional residential units;
- Expansion of Ewa Elementary School;
- A district park;
- Commercial/retail center;
- Church parcels; and
- A business park.

This master-planned community is primarily a revitalization project, sponsored by the City and County of Honolulu, Department of Housing and Community Development. This effort began in the late 1970s, when Fernandez Village was identified by the City and County for revitalization.

The project will encompass a total of 600 acres at build-out. Of that, 242 acres will be residential and 350 acres will be for other uses. These uses include a 225-acre, 18-hole golf course (drainage), a 25-acre park, a school, etc. Development of this community has been expedited through the 201E application process.

There will be approximately 1,600 dwelling units total, of which 277 are existing and will be rehabilitated. (Some units may not be salvageable and will be destroyed.) Of these 1,600 units, 60% will be "affordable," sold at 120% or below the median income. Construction began in August 1994 for 113 affordable homes. Reservations for 283 market units are being accepted. Market units in the project will sell for approximately \$350,000 to \$450,000. Full build-out is expected to take until the end of the century.

Infrastructure for Tenney Village (the first project) is just starting. The existing infrastructure for this village will be upgraded to current standards. The main access route, Renton Road, will be expanded, and road construction is expected by December of 1995.

Source: Interview, City and County of Honolulu, Department of Housing and Community Development.

Ko Olina

The Ko Olina development is accessible from the H-1 freeway. It is approximately 24 miles to the west of Honolulu. The project extends along 1.9 miles of shoreline in Ewa.

The developer, West Beach Estates, estimates that more than 8,700 condominium and single-family residences eventually will be built at Ko Olina. Final approval for the project was obtained from the City and County of Honolulu in 1986. Site work and infrastructure development began in March of 1987. Fully completed infrastructure includes facilities for sewers, water, drainage and streets.

The original proposals for Ko Olina included plans for two Phases:

Phase I of the Ko Olina Resort is master planned to be a 642-acre residential/resort community. The resort area along the shoreline is planned for just under 4,000 visitor units. Development projections also call for 5,200 housing units of which 3,700 units are intended to be medium density apartment units and 1,500 units low density units. Amenities include: four oceanfront sandy beach lagoons; a 170-acre, 18-hole golf course and clubhouse; a 450-slip marina; a Hawaiian cultural center; three public parks, which consist of two large beach parks and a community park; sites for a school, child care center, and fire station; beach and yacht clubs; tennis facilities; two commercial centers, including one theme shopping center; and several restaurants.

Phase II of the Ko Olina Resort project encompasses 372.6 acres of land. It is planned to include two additional 18-hole golf courses, commercial development in the eastern portion and a neighborhood park.

Stipulations for the development of the project required that 10% of the units to be sold to 80% or below the median income level.

To date, the project is far behind the original construction schedule. According to the Planning Department, additions to

the resort portion as well as residential construction have been delayed indefinitely. Although five hotel sites have been planned for and sold, only one is in operation -- the 387-room Ihilani luxury hotel and golf course. The planned beach lagoons are completed as well as the marina basin, but no piers have been built. At present reservations are being taken on a total of 280 condominium units. Prices range from \$220,000 to \$350,000.

Sources: City and County of Honolulu, Department of Land Utilization, Director's Report File 85/Z-3; Developer interview (West Beach Estates).

Makakilo

This hillside community overlooks the Kapolei area. It is accessible from the H-1 freeway via Makakilo Drive. One of the Kapolei area's earliest residential developments, development of Makakilo began in the early 1960's. Today, there are more than 3,500 homes and a population of about 13,000. The development is more than 50 percent complete, with approximately 2,500 homes planned. Developer Finance Realty will continue Makakilo's development through the end of this decade, aiming at an eventual inventory of about 6,100 homes. Projects currently on the market include:

Palehua Point: There are 47 homesites available at Palehua Point from \$220,500 with home and lot packages starting at \$510,000.

Makakilo Ridge: There are 114 homesites and home and lot packages begin at \$197,000 to \$595,000.

Royal Ridge: Phase I of Makakilo's newest development, Royal Ridge, features 72 fee-simple, single family homes with prices starting at \$330,000.

West Hills: West Hills offers 66 house lots available for purchase.

Westview at Makakilo Heights: Schuler Homes, Inc. is building 500 townhomes, about 10 percent of which are in the affordable category (80% or below the median income). The

first phase was completed in late 1993, with 148 units priced between \$185,000 and \$215,000.

Sources: Estate of James Campbell "Fact Sheet"; Planning Department Interview; Developer interview (Finance Realty, Ltd.); Department of Land Utilization Director's Report 82/Z-6.

Makaiwa Hills

On the hillside to the west of Makakilo lies Makaiwa Hills, a project of the Estate of James Campbell. The Development Plan Annual Report, Fiscal Year 1994 indicates a total of 1,066 units by 2010 in Makaiwa Hills. The Planning Department's Land Use Model indicates a projection of 2,130 units by 2010, a figure which was used in this market assessment. Land Use Commission records indicate state-level approval of 1,700 acres for the Makaiwa Hills project. The proposed development received Development Plan approval in 1993, (Ordinance 93-114) and but the zoning has yet to be authorized. Consequently, infrastructure improvements have not begun.

The project master plan includes a variety of residential unit types and price levels. In addition, an off-site affordable rental housing program is proposed. The affordable housing program would be built in advance of the on-site project market units. The units would consist of 250 units for families earning 50 to 80 percent of the median income. Overall, 700 to 900 off-site rental units are planned and offered at rental prices to families whose income range is between 50 to 140 percent of median income.

The Makaiwa Hills development also includes a regional mall, a public district park, and preservation areas in the gulches of the project area.

Sources: Development Plan Annual Amendment Review, 1993; Planning Department interview.

Royal Kunia

This project is expected to be developed on 1,000 acres north of the Village Park community on lands currently planted in sugarcane. The project will be a golf-oriented community accessible from H-1 via Kunia Road.

To date, the City has designated over 1,000 acres for urban use in Royal Kunia Phases I and II -- including approximately 358 acres for residential and apartment use. The first phase of the Royal Kunia project received DP approval for 2,050 residential units in 1988. Construction of Phase I infrastructure is ongoing and the golf course is substantially completed. According to Kunia Residential Partners (developer of Phase I), 1,748 units are scheduled to be delivered in a projected five-year build out. Of the total 1,748 units, approximately 350 units are scheduled to be delivered by the end of 1995.

Several stipulations were imposed on this phase of the development. Provisions were made for 150 units for the under 80 percent of median income bracket; 20 percent of these units are to be reserved for the elderly. Of the project's total units, 50 percent are to be in the affordable range. The 50 percent affordable component consists of:

- 10 percent at 80 percent of median income housing;
- 20 percent at 80 to 120 percent of median income; and
- 20 percent at the 120 to 140 percent of median income range.

During fiscal year 1992 a portion of the second phase of the Royal Kunia received Development Plan approval. This consisted of an additional 1,000 units on approximately 400 acres of land.

In both the 1992 and 1993 Development Plan Annual Amendment Reviews, the applicant requested increased acreage to be redesignated. Each request, however, was denied. In the 1994 Development Plan Annual Amendment Review, the applicant again requested redesignation of

approximately 114 acres. The Planning Department has recommended denial of the proposed amendment.

Source: Development Plan Annual Amendment Review, 1994.

Villages of Kapolei

The Villages of Kapolei is a master planned community located on the eastern edge of the new City of Kapolei; a portion of the proposed University of Hawaii West Oahu campus will be located to the east. The 890-acre site is accessible from H-1 via Fort Barrette Road and Farrington Highway.

This community is a public/private cooperative housing venture involving the state Housing Finance and Development Corporation (HFDC), Honolulu Department of Housing and Community Development, The Estate of James Campbell and numerous private developers. Under agreement with HFDC, 60 percent of the homes must sell at affordable rates, while 40 percent may be sold at market prices set by the developer.

The Villages of Kapolei project is a community consisting of eight 'villages' with a mix of affordable and market housing types. Mixes of housing include single family and multi-family for sale; assisted, elderly, and family rentals; and owner/builder self-help lots. In addition, the villages will provide several recreation centers; a community and neighborhood park; two or three church and day care sites; two elementary schools; one intermediate school; a neighborhood commercial area at the village center; and a golf course with clubhouse. It is currently projected that at build-out, there will be approximately 5,000 residential units on 890 acres. Projects built and/or underway include:

Village I (Kumu Iki): This initial 71.3-acre phase of the Villages of Kapolei began in August 1989 and was completed by Castle & Cooke Properties, Inc. as a 519-unit village in 1991.

Village II (Aeloa): Site preparation by Watt Hawaii for this 571-unit mixed-density village began in 1994. Completion of the entire 70.67-acre project is scheduled for 1995. Affordable

units will begin at \$140,000 and market-priced properties will range from \$264,000 to \$420,000-plus.

Village III (Malanai): At build-out Malanai will have 296 homes situated on 51.1 acres adjacent to the Kapolei golf course. Developer Watt Hawaii delivered the first homes in October 1992. Completion of the project is scheduled for 1994. The market-priced homes in this community range from \$280,000 to \$350,000 for properties along Kapolei golf course. Village III also includes the first multi-family project within the Villages of Kapolei. Located on a 5.16 acre-site between Malanai and the entrance to the Kapolei Golf Course, the 88 unit condominium project of Malanai Iki is being developed and priced between \$96,000 and \$126,000 for one, two, and three bedroom units.

Village IV (Kekuilani): A joint venture of M.M.C. Development and Stanford Carr Development Corp., the Kekuilani Development Corp. began construction in August 1993 on this 645-unit, mixed-density community. The 60.61 acre site along with Village IV, and Village II, will contain the remaining golf course frontage units of the Villages of Kapolei project. Prices range from affordable at \$99,000 to \$330,000 for golf course single-family homes. Completion of the project is anticipated in early 1996.

Village V (Kulalani): West Beach Estates is developing multi-family projects within Villages V and VI for a total of 1,200 units. Village V, Kulalani, is a 128 unit townhome project. Kulalani sits on approximately 7.5 acres and is located next to the Kapolei Elementary School. All of the units (100%) will be affordable units with prices targeted for 80 percent of the median income range. Additional units are planned for Village V, to eventually total 574.

Village VI (Pae Ko Gardens): West Beach Estates also is developing 128 affordable multifamily units in Village VI, targeted for 80 percent and below the median income range. The completion of the 7.5-acre project is estimated for year-end 1994.

Villages VII and VIII: An additional 1071 units are planned for Villages VII and VIII between 1996 and 2000.

The project's infrastructure is projected to be developed in six phases. The first five phases have been completed, including drainage improvements, mass grading and the golf course. The sixth and final phase will consist of off-site infrastructure construction that will include the widening of Fort Barrette Road and Farrington Highway.

In the 1994 Development Plan Annual Amendment Review, the applicant, (HFDC and various other owners) requested to amend the Ewa Development Plan Land Use Map to reflect existing construction and to recognize the Villages of Kapolei master plan as adopted by the HFDC's Board of Directors. After review, the Planning Department recommended the redesignation of approximately 482 acres from agriculture to low density apartment; and the redesignation of approximately 15 acres as the "Village Center" from agriculture to commercial emphasis mixed use.

Sources: Development Plan Annual Amendment Review, 1994; Housing Finance and Development Corporation publications; Estate of James Campbell Summary Fact Sheet.

Waikele

This master planned community is being developed north of H-1 between the Waikele exit and Kamehameha Highway. Three developers have provided residential units within the Waikele community: Armstrong Builders, Castle & Cooke Homes Hawaii and Schuler Homes, Inc. The Waikele Power Center, a large commercial retail development, is a major additional amenity to the community.

Castle & Cooke Homes Hawaii developed a project of 250 single-family homes. The Armstrong development included 82 single-family dwelling units, all of which have been sold. To date, the Schuler Homes, Inc. development at Waikele includes:

- 686 affordable units built;
- 204 gap-group units built;

- 478 market priced single-family units built or under construction;
- One 18-hole golf course; and
- One H-1 freeway ramp for ingress and egress.

Substantial stipulations on the pricing of the products to be offered at Waikele were imposed in the entitlement process, although all prices are allowed to rise with the Consumer Price Index. The stipulations on Waikele development include the following:

- 10 percent of the units are to be priced for 80 percent of median income or below bracket;
- 8 percent of the units are to be priced below \$120,000, and reserved for six months for those earning less than 120 percent of median income level;
- 7 percent of the units are to be priced below \$140,000, reserved similarly for the less than 140 percent bracket;
- 10 percent of the units are to be priced below \$150,000, reserved similarly for the less than 150 percent of median income bracket; and
- 15 percent are to be priced below \$170,000, reserved similarly for the less than 185 percent of median income level.

Waikele received Annual Development Plan Amendment Review approvals in 1985 and zoning approval in 1986. At the time of this analysis, close to 1,700 of the 2,915 planned units had been completed and an additional 1,000 units were anticipated to be completed by the year 2000. This development is expected to be built-out over the remainder of the decade.

The infrastructure for the development for Waikele was ninety percent complete as of August 1994. Off-site improvements

consist of an H-1 overpass at Manager's Drive, a water reservoir, roadways and utilities.

Sources: Market Assessment for the Wahiawa Lands (1992); Developer interview (Schuler Homes, Inc.)

Appendix B

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Appendix C
LIMITING CONDITIONS

Appendix C

LIMITING CONDITIONS

- The words "project," "projection" and "forecast" are not meant to follow the definition of any professional organizations.
- The consultant assumes no responsibility for economic, market or physical factors occurring after the last day of field work in September 1994, which may affect the opinions stated herein.
- No opinion is intended to be expressed for legal matters or that would require specialized investigation or knowledge beyond that ordinarily employed by a market consultant.
- No opinion as to title is rendered.
- No engineering reports or surveys have been prepared by or made available to the consultant.
- Maps and exhibits included herein are for illustration only, as an aid in visualizing matters discussed within the report. They should not be considered as surveys or relied upon for any other purpose.
- The estimates included in this report are utilized to assist in the market assessment of the property based on current market conditions, anticipated short-term supply and demand factors and a continued stable economy. Therefore, estimates are subject to changes in future conditions that cannot be accurately predicted by the consultant.
- The consultant is not qualified to detect the existence of potentially hazardous material which may or may not be present on or near the property. The client is urged to retain an expert in the field before making a business decision regarding the property.
- This report, or any portions thereof, shall not be included in any public offering or financing document without the consultant's review and consent.

Appendix D
PROFESSIONAL QUALIFICATIONS

GAIL W. ATWATER, AICP

Ms. Atwater is an experienced land use planning consultant serving both public and private sector clients. She specializes in market feasibility analyses, the application of strategic planning to land use, and facilitation of government and private sector executives in major planning efforts. She has been a land use consultant for the past seven years, both as an independent and as an associate of Deloitte & Touche Management Consulting. She also has six years of corporate managerial experience at GTE Hawaiian Tel.

EDUCATION

Course work completed for Master in Urban and Regional Planning, with specialization in Land Use Planning, University of Hawaii
Master of Business Administration, Marketing, University of Hawaii
Master of Education, Counseling and Guidance, Florida Atlantic University
Bachelor of Arts, Literature, Wheaton College

SELECTED CLIENTS

City and County of Honolulu, Building Department
City and County of Honolulu, Transportation Services Department
State of Hawaii, Department of Business, Economic Development and Tourism
State of Hawaii, Department of Land and Natural Resources
State of Hawaii, Department of Transportation
Schuler Homes, Inc.
Helber, Hastert & Fee
Hawaii Strategic Development Corporation
Chamber of Commerce of Hawaii
GTE Hawaiian Tel
Hawaiian Electric Company
Outrigger Hotels Hawaii
Estate of James Campbell
Blood Bank of Hawaii

HIGHLIGHTS OF RELEVANT EXPERIENCE

Conducted the market assessment and analysis of employment generating opportunities for an 800-acre master planned community proposed for the Galbraith Trust Wahiawa Lands. This study was included in a Development Plan Amendment Application and Environmental Impact Statement.

For the City and County of Honolulu under Deloitte & Touche, analyzed the need for a Civic Center in Kapolei to provide Oahu's second city with civic services and facilities. Following a demographic study of projected

population and employment trends in Ewa and Central Oahu, analyzed the activities of each City department to determine the type and level of regional services needed and which departments could be relocated.

Co-authored analysis of supply and demand for industrial land on Oahu for the market assessment of Kapolei Business Park.

Assisted in preparing an economic impact study for the developer of Ko Olina Resort in West Oahu, including analysis of market opportunities and evaluation of fiscal impact.

For the State of Hawaii, Department of Land and Natural Resources, (DLNR), designed, facilitated and managed a major public/private effort to overhaul the regulation of the Conservation District.

Also for DLNR, managed completion of a project involving development and application of a strategic land management methodology for over 200,000 acres of state leased agricultural land. Developed strategic land use plans for four major parcels totaling over 30,000 acres.

Facilitated top management in development of strategic plans for diverse private and public sector clients, such as the Chamber of Commerce of Hawaii, Blood Bank of Hawaii and Hawaii Strategic Development Corporation.

For the Governor's Office of Children and Youth, developed strategies for financing an envisioned optimal system for early childhood education in the year 2000, including 56 financing mechanisms and a proposed legislative agenda.

Developed three consecutive five-year strategic plans as consultant to GTE Hawaiian Tel. Analyzed Pacific Basin opportunities for worldwide operations of GTE.

BUSINESS EXPERIENCE

- | | |
|----------------|---|
| 1985 - Present | Planning Consultant, both independent and as subcontractor for Deloitte & Touche. |
| 1980 - 1985 | Service Office Administrator, GTE Hawaiian Tel, responsible for operational planning and project implementation, \$7 million operating budget, and management of operational/financial planning and analysis group. |

Appendix E

Socio-Economic Impact Assessment
Community Resources, Inc., November 1994

**SOCIO-ECONOMIC IMPACT
ASSESSMENT OF EAST KAPOLEI
RESIDENTIAL PROJECT**

November 1994

Prepared for:
Schuler Homes, Inc.

Prepared by:
Community Resources, Inc.

EXECUTIVE SUMMARY

The proposed East Kapolei project covers about 1,044 acres of land recently used for sugar cane cultivation. Schuler Homes, Inc. proposes a residential development for the site, to be built out in two phases over a period of 15 or more years.

The project site lies between the planned North-South road, to the west, Farrington Highway (to the north), the `Ewa Villages project (south or makai of the project) and the West Loch project. The first homes would be developed in the makai half of the project site, on land transferred to the Galbraith Estate by the State (Phase 1). Over time, the project would come to include, in both phases, some 10,000 housing units, land for two elementary schools and adjacent parks, and 20 acres of commercial space. (Land use permits are also being requested for another 27 acres of commercial area to be retained by the Estate of James Campbell.)

A market assessment for the project has indicated that project buildout could occur by 2011. At first, residents would reach their homes through a road running through the site to Farrington Highway. The North-South road would become the major roadway to the project, leading to Farrington Highway and to H-1.

The `Ewa Development Plan Area is slated for rapid urbanization. Major new residential areas have been planned, along with a city center in Kapolei. The area could potentially have a strong employment base, but employment center — above all, Barbers Point NAS and Ko `Olina may not generate as many jobs as expected, as fast as anticipated. Residents are concerned with the region's already limited infrastructure and traffic congestion. New public facilities and roadways are being planned to meet the needs of regional growth.

Knowledgeable community informants interviewed by Community Resources, Inc. in September 1994 tended to evaluate the proposed project in terms of the likelihood that it will add to or alleviate `Ewa's current traffic problems and lack of community facilities.

Project impacts include:

- **Employment.** Construction would support more than 13,000 person-years of direct employment over the entire construction period. The average number of direct jobs would be about 825 annually in 1996-2000, then rise to a high of 950 annually in 2006-2010. Construction spending would also support a total of 28,000 person-years of employment in indirect and induced jobs during the construction period.

Operations jobs would be created largely in the project commercial areas. Total on-site operations employment would amount to about 275 jobs by 2000, and reach a total of nearly 900 jobs at buildout. At buildout, an additional 525 indirect and induced jobs would be supported by project operations.

- **Population and Housing.** The project population is estimated as 6,100 in 2000, increasing to 24,500 in 2010. At buildout, the total population would be about 28,000. The population supported by operations-related jobs (including indirect and induced jobs statewide) could live in some 975 households — a small fraction of the 10,000 units in both phases of the project.

Population growth in the `Ewa Development Plan Area (DPA) is likely to be much less rapid than City and County General Plan policy indicates. Project development would help to allocate expected population growth to `Ewa by 2010 in line with current policy, reducing somewhat the pressure for urban growth in other areas.

- **Government Revenues and Costs.** Project construction is estimated as yielding about \$105 million (1994 dollars) in State taxes. City and County property taxes from the project would reach about \$6.5 million annually at buildout (1994 dollars, at current tax rates), and continue at that level. The project would further contribute to lower government costs, in that the developer would participate in the development of infrastructure and facilities along with government agencies.

The developer's participation in infrastructure planning can help infrastructure development occur more quickly and efficiently.

- **Social impacts include:**
 - Provision of additional housing for O`ahu residents, responding to the recognized islandwide need for additional housing.
 - Improved quality of life for residents newly able to own their homes, and for others to the extent that crowded conditions are alleviated.
 - Intensification of demand for regional infrastructure, facilities and services in `Ewa. This will likely involve competition for scarce resources and increased problems of traffic congestion in the short term, but is likely to lead to community pressure for timely construction of planned facilities and delivery of services. The greater the regional population, the more justification will exist for

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Section 1 INTRODUCTION

1.1 PROJECT DESCRIPTION

The East Kapolei project is planned for approximately 1,044 acres of land in 'Ewa District, O'ahu. The site lies makai and south of Farrington Highway, west of the West Loch developments on Fort Weaver Road, and north of the 'Ewa Villages area along Renton Road. Its western boundary is the proposed North-South road, a major road linking central 'Ewa to the H-1 Freeway. On the western side of the proposed road is State land, where construction of the future University of Hawaii, West O'ahu and Kapolei High School is planned. (Exhibit 1-A shows the site in relation to the Development Plan Areas of the City and County of Honolulu. Exhibit 1-B indicates the land uses around the site.)

The project has two parts or Phases, as shown in Exhibit 1-B:

- The Phase 1 land is currently owned by the State of Hawaii. The State has agreed with the Galbraith Trust (represented by Hawaiian Trust Company, Ltd.) to a land exchange. The State will gain some 2,200 acres of agricultural land in Central O'ahu in exchange for 500 acres of urbanized land in 'Ewa. The Office of State Planning has petitioned the State Land Use Commission to designate the Phase 1 parcel as Urban. When that designation is made, the exchange can proceed.

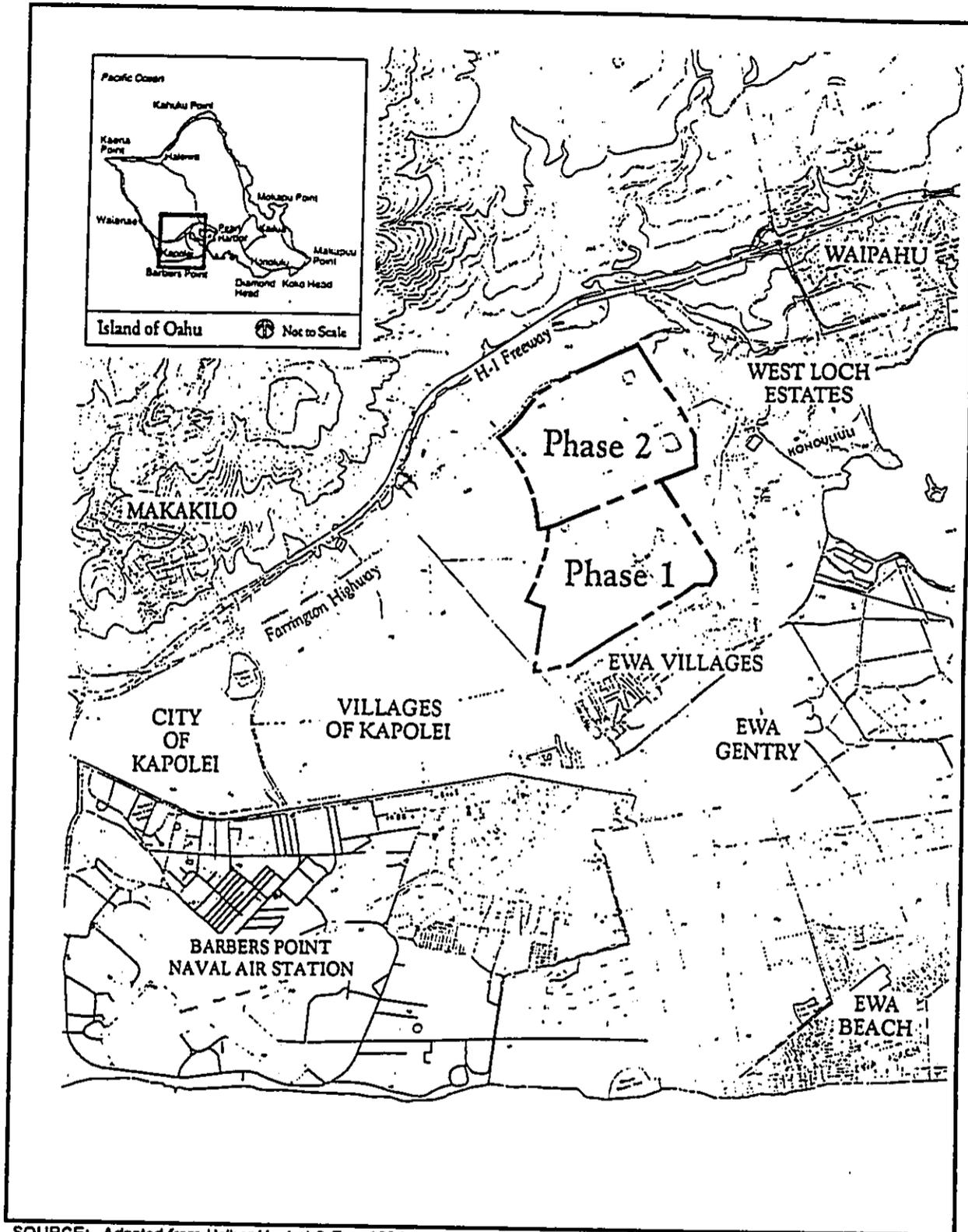
The Galbraith Estate and Schuler Homes, Inc. have entered into an agreement to develop the Phase 1 land as a housing development.

- Phase 2 land is being bought by Schuler Homes, Inc. from the Estate of James Campbell. (While Exhibit 1-B shows the Phase 2 land as 544 acres in area, the exact size of the parcel is still being negotiated.)

The proposed development would consist of housing with supporting infrastructure and public facilities. Each phase would probably include:

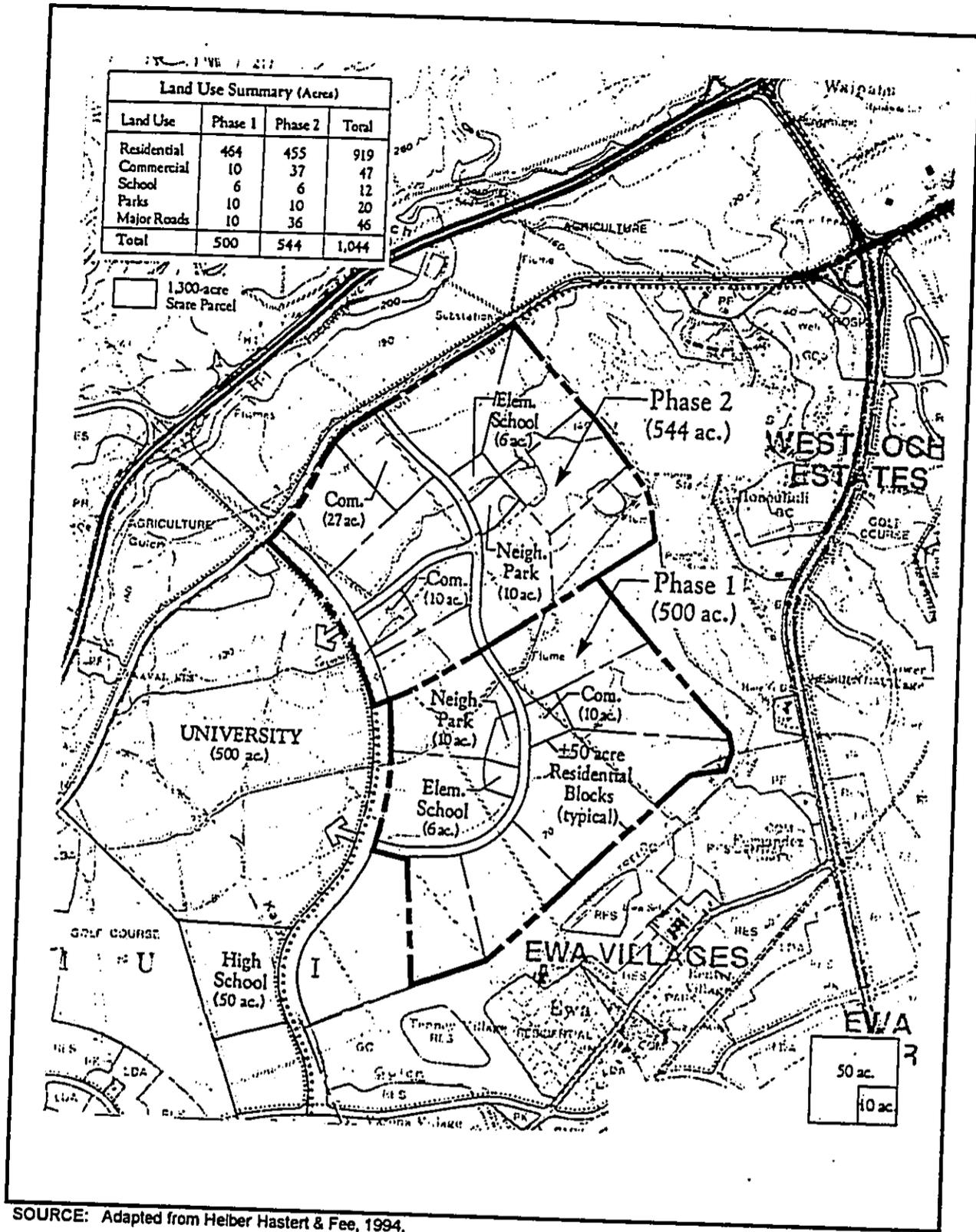
- About 5,000 units of housing, including multi-family and single-family units. These would be built for the resident market. In conformity with City and County policy, about 30% of units would be offered at "affordable" prices to buyers with household incomes ranging from 80% to 120% of the median. Other units would be sold at market prices, but would still be priced at levels comparable to those of nearby 'Ewa and Central O'ahu projects.

Exhibit 1-A
LOCATION MAP



SOURCE: Adapted from Heiber Hastert & Fee, 1994.

**Exhibit 1-B
PRELIMINARY CONCEPT PLAN**



SOURCE: Adapted from Heber Hastert & Fee, 1994.

- Land for an elementary school.
- Land dedicated to park use, adjacent to the school site.
- About 10 acres of land for neighborhood commercial development. That land is shown in Exhibit 1-B as a single parcel in each Phase. However, the acreage could be divided into separate lots, to serve smaller neighborhoods in each Phase.

In addition, a 27-acre parcel included in Phase 2 would be retained by the Estate of James Campbell for eventual development. It is slated for neighborhood commercial use. Because this parcel would not be developed by Schuler Homes, Inc. and no timetable for development has been set, it will not be discussed further in this socio-economic impact assessment.

At first, a road from Farrington Highway through Phase 1 will provide access to the property. When the North/South road is built, both Phase 1 and Phase 2 will have road links to this major road.

If infrastructure development begins in 1996, the first homes might be offered for sale in 1997. Schuler Homes expects to build housing at the site, at Phase 1 then at Phase 2, continuously thereafter. A market assessment for the project indicates that buildout of both phases — 10,000 units — could come as early as 2011. However, the construction period could take longer.

1.2 PURPOSE AND SCOPE OF THIS REPORT

This report assesses the socio-economic impacts of the proposed project. It takes into account both existing conditions and likely future trends in the area surrounding the project.

The report is intended to serve as an appendix to an Environmental Impact Statement being prepared by Helber, Hastert & Fee, Planners. Sections of a draft version of the report were provided for inclusion in an Environmental Assessment of the project.

The report is written to identify and disclose information that may be of use to decision makers and members of the general public as they evaluate the implications of the project. Discussions of the likely points of compatibility of the project with surrounding land uses, of potential impacts, and of steps which might mitigate unwanted impacts are intended to help in the EIS process and to contribute to community planning over the long term.

The sections of this report deal with:

- Introductory issues;
- Existing conditions and emerging trends in the area surrounding the project;
- Economic and demographic impacts of the project;
- Impacts on public facilities and services;
- Other social impacts; and
- Potential mitigation measures and processes that would appropriately respond to adverse impacts of project development.

Section 2 EXISTING AND EMERGING CONDITIONS IN THE SURROUNDING COMMUNITY

2.1 DEFINITION OF STUDY AREA

The project is located on the `Ewa Plain. Its location and the area affected by it could be defined in several different ways.

The site is within the State's `Ewa District and the City and County of Honolulu's `Ewa Development Plan Area (DPA). As a major housing project built in response to existing and anticipated demand, the project is intended to serve consumers from all areas of the island of O`ahu. It will compete for buyers with other projects in `Ewa and Central O`ahu. Finally, it will add to traffic on the H-1 Freeway, affecting residents of Wai`anae, who also depend on the western sections of this roadway, along with other `Ewa residents.

For this report, the `Ewa DPA is the Primary Study Area. It includes the land divisions of Hono`uli`uli and Pu`uloa. This region has been identified as a high-growth area of O`ahu, in which planned residential, commercial, industrial, and public developments are being proposed to form a Second City. (The State's `Ewa Judicial District is much larger, with boundaries running from Halawa in the east to Barbers Point in the west, as shown in Exhibit 2-A. That region is not usefully considered as a unit for the purposes of this report.)

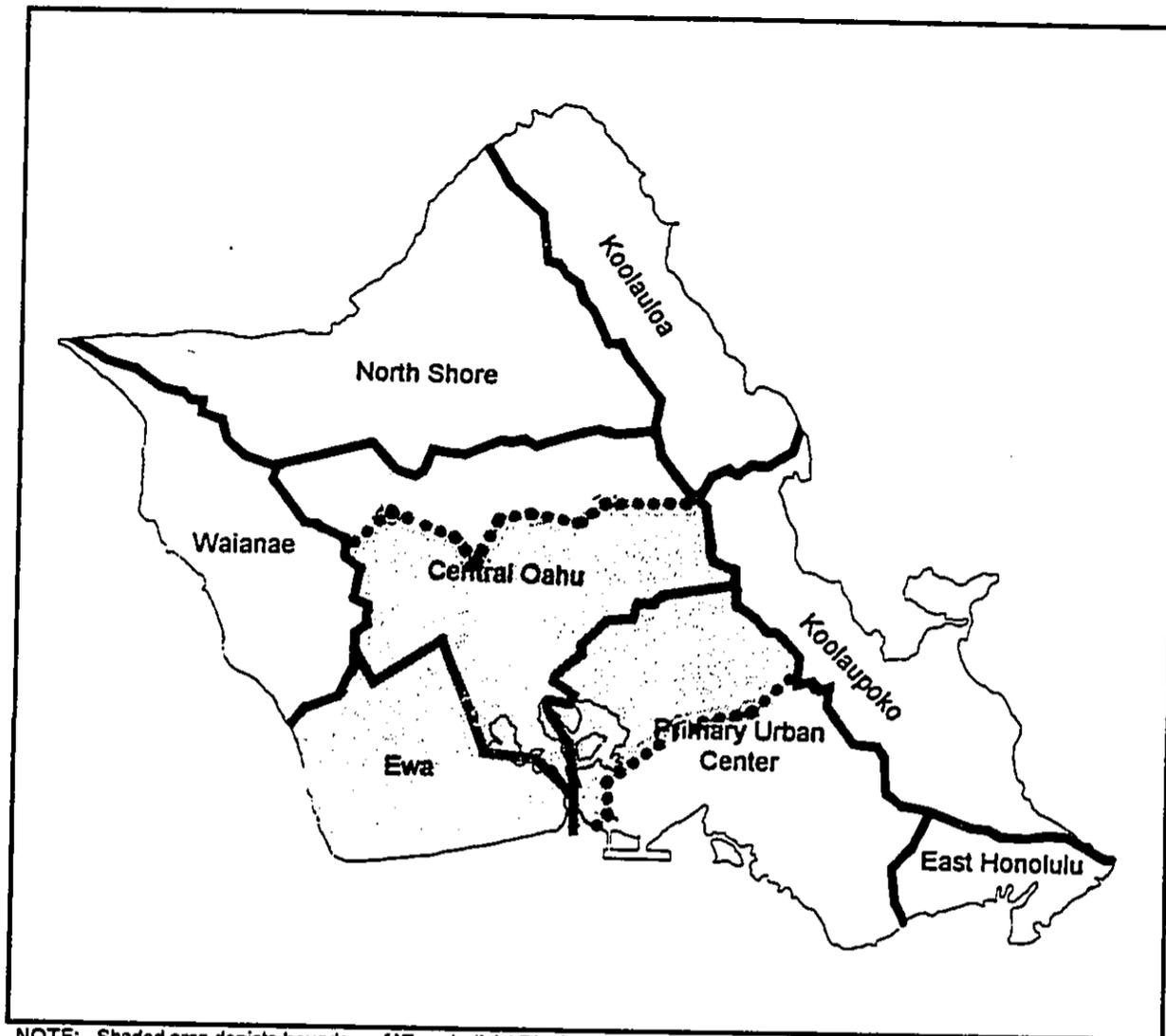
Because the project will have impacts on residents and housing projects in the DPAs adjoining `Ewa, the Wai`anae and Central O`ahu DPAs are considered Secondary Study Areas in this report.

2.2 PRIMARY STUDY AREA

2.2.1 Overview of `Ewa

`Ewa lies in the leeward district of O`ahu, to the west of Pearl Harbor. `Ewa means "crooked" or "ill-fitting." It is said that the gods Kane and Kanaloa once walked around O`ahu and threw stones to determine district boundaries. Wherever the stone landed would become the boundary. However, when they came to present day `Ewa, they could not find the stone they threw and called that district "Ewa." The story concludes that the strayed stone was later found at Pili o Kahe, a place at the present-day boundary of Wai`anae and `Ewa in Nanakuli.

Exhibit 2-A
`EWA DEVELOPMENT PLAN AREA



NOTE: Shaded area depicts boundary of `Ewa Judicial District.

SOURCE: Adapted from City & County of Honolulu Planning Department, 1992.

Kamehameha III awarded the `ahupua`a of Hono`uli`uli to Chief Miriam Ke`ahikuni Kekau`onohi in 1848. She in turn leased it to ranchers. James Campbell bought Hono`uli`uli from a rancher in 1878. Campbell had the first artesian well drilled on his ranch in 1879, and subsequently developed well systems which allowed the cultivation of sugar cane in Hono`uli`uli. Campbell leased about 2,000 acres of land to Castle and Cooke in 1890 to raise cane under the incorporation of Ewa Plantation Company. A plantation settlement was established around the mill site on Renton Road and `Ewa became a plantation community.

Castle and Cooke dissolved the Ewa Sugar Company in 1970 and sold its operations to AMFAC, thus merging Ewa Plantation with O'ahu Sugar Company (OSCo). Cane cultivation continued but processing was done at OSCo's Waipahu mill. OSCo's lease with Campbell Estate will end in 1995.

`Ewa is made up of many different and distinct communities. Old and new settlements stand in contrast. Although `Ewa Villages and `Ewa Beach, two older and major communities, are predominantly Filipino, Caucasians made up the major ethnicity (followed by Filipinos) in the `Ewa Development Plan area, in the 1990 Census (See Appendix A-1). The `Ewa Development Plan area (DPA) had a large proportion of young adults, aged 18 to 34 years old.

Some 21% of home owners in the `Ewa DPA paid 35% or more of their income for housing expenses, while the island-wide average was only 15%.

Due to the presence of the Barbers Point Naval Air Station (BPNAS) and the Iroquois Point housing area, the number of persons employed in the military was double that of Honolulu County. The number of men and women working in the civilian labor force was slightly higher than the island-wide population. (See Appendix A-5).

Although sugar has been the primary activity in `Ewa, BPNAS and James Campbell Industrial Park (JCIP) have provided an alternative industrial base. New office and commercial projects in Kapolei provide a basis for further diversification of the economy.

Regional population trends indicate that `Ewa's population will more than double by 2010 (Planning Department, City & County of Honolulu, April 1994). The average annual growth rate from 1980 to 1990 was 1.87%, and is forecast as about 4%, between 1990 and 2010. In 1990, `Ewa accounted for about 5% of O'ahu's population; in 2010, it is expected to account for about 9% of the total island population.

The anticipated population growth follows from the development of major new subdivisions. In the 20-year period from 1990 to 2010, `Ewa's housing stock is expected to increase by nearly 17,000 units, more than double the 1990 stock. (This estimate falls below earlier ones, that treated all permitted developments as built out by 2010. One count of permitted and proposed units in `Ewa included 13,975 existing units and 39,089 future units [Estate of James Campbell, 1993c.]

With urbanization, `Ewa's regional jobcount is estimated as reaching 48,552 jobs in 2010, nearly four times the 1990 figure. However, the speed of job-creation at Ko' Olina and at BPNAS (after the base closes in 1997) is uncertain. Kapolei will soon become the major employment center of the region. Campbell

Industrial Park and Barbers Point Deep Draft Harbor will function as industrial and maritime employment centers.

2.2.2 Geography

The project site is in the `ahupua`a of Hono`uli`uli.

The two major land forms in the `Ewa region are the `Ewa Plain and Makakilo upland. H-1 Freeway and Farrington Highway are the general boundaries of the two land areas. The cinder cones, *pu`u*, along the Wai`anae Mountain Range form the peaks of that region: Manawahua, Kapuai, Makakilo, Palailai, Kapolei.

`Ewa Plain is an elevated coral reef covered by alluvium. Elevations vary from about 50 feet above mean sea level (MSL) near the southern boundary at NAS Barbers Point, to 2,300 feet MSL at Pu`u Manawahua, the highest peak in the `Ewa region.

The climate is relatively dry in `Ewa. However, the land was arable in earlier times. There were once large terrace areas near West Loch, referred to as `Ewa taro lands. Hawaiians used the holes and pits in the coral for planting.

2.2.3 History and Current Conditions

James Campbell purchased 41,000 acres of land in Hono`uli`uli for \$95,000 in 1877. He bought the dry ranch land from owner John Coney. Looking for a water source to cultivate sugar cane, Campbell hired John Ashley to drill for water. On September 22, 1879, Ashley tapped the first artesian well, named Wai`ani`ani, which continued to flow for 60 years.

Soon after the discovery of the artesian well, Benjamin Dillingham leased land from Campbell to cultivate sugar on a large scale. He sought out W.R. Castle's expertise in sugar cane cultivation, and shortly thereafter, the Ewa Plantation Company was chartered and incorporated. Dillingham also obtained permission from the Government of Hawai`i to construct O`ahu's first railroad — Oahu Railway and Land Company (OR&L). With water and transportation available, `Ewa was transformed into a plantation community in the 1890s.

`Ewa's sugar and plantation communities flourished for decades. After World War II, no new investment was made in the plantation villages. Sugar cultivation remained, but urban development began to encroach on sugar land on the `Ewa Plain in the 1980s. Now the area is largely planned for urbanization.

(See Appendix A-7 for an inventory of residential projects existing and/or planned in `Ewa.)

Project Site. The project site has been planted in sugar cane for most of this century. With the closing of Oahu Sugar Company (OSCo) slated for 1995, this The landowners have negotiated with truck farmers to continue agricultural use of the land in the next few years.

Major Communities. CRI compiled 1990 Census data for five `Ewa residential areas (`Ewa Villages, `Ewa Beach, `Ewa by Gentry, Barbers Point NAS, and Makakilo). Kapolei and West Loch are also notable developments as of 1994. These are discussed here in order of age:

- **`Ewa Villages.** Sugar mill construction commenced in 1891, and plantation villages sprouted up around the mill site over the next sixty years. The number of residential units amounted to over 1,200 during that era. The Ewa Sugar Company built most of the villages. At one time there were eight villages, housing immigrant plantation workers from Portugal, Spain, Korea, Japan, and the Philippines. Four of the newer villages — Renton, Tenney, Varona, and Fernandez — are still standing, while "C," Mill, Middle, and Lower Villages were razed

Renton Village is the historic core of the Villages. It was built between 1913 and 1938. Much of the community's infrastructure and facilities were constructed during George F. Renton's tenure as plantation manager. Improvements to the area included: construction of most of the mill structures, a system of roads, installation of street lighting, water mains, service lines and plumbing, fire equipment, theaters, clubhouses, playgrounds, tennis courts, a swimming pool, administration building, and hospital.

Although the villages were rather self-contained entities, a number of amenities served as the focal point and a gathering place for the entire area. These included the post office, general stores, churches, butcher shop, and a bank. Several churches and social halls are also still standing in the Villages.

There has been no construction of new villages since the 1950s. Fernandez Village was redeveloped in the late '70s to early '80s, and the City is currently engaged in revitalizing the Villages in order to preserve the plantation character and heritage of the mill area.

The `Ewa Villages population was 3,780 in 1990 (See Appendix A-8, Demographic Characteristics), and residents were primarily Filipino (67%). The median age was 32.4 years. Most of the Villages residents

were born in Hawai'i, while one-third were born in another country (Appendix A-9). About half of the residents were living in houses that were more than twenty years old (as shown in Appendix A-10), while about 40% had lived in their homes from two to 10 years. (Most of these households probably reside in Fernandez Village, which was redeveloped.) Two-thirds of the households were owner-occupants, while one-third were renters. The average household size — 4.19 persons per household in 1990 — was very high for O'ahu.

In 1990, almost half of the Village households received Social Security income, and one-third received retirement income (See Appendix A-11). Few Village residents (1%) lived in poverty, and the median household income was just above the island median.

The City Department of Housing and Community Development (DHCD) plan for revitalizing the `Ewa Villages calls for a number of improvements, including:

- developing some 957 affordable and market, single- and multi-family residential units, while also revitalizing 273 existing homes;
- expanding `Ewa Elementary School;
- creating a district park and an 18-hole municipal golf course;
- developing a commercial/retail center and a business park; and
- providing for existing churches (through land acquisition or relocation).

The plan calls for not only architectural renovation to preserve the historic character of the villages, but also rental and home ownership programs for Renton, Tenney, and Varona village residents.

The project is now scheduled for completion between 1997 and 1998, with homes rehabilitated by 1997. The golf course is presently under construction.

- **`Ewa Beach.** `Ewa Beach began as a weekend recreational area in the 1940s and eventually became a permanent residential community. There were 3,426 housing units reported in the 1990 Census.

There were 14,315 people residing in `Ewa Beach in 1990 and residents were predominantly Filipino. The median age was 28.6 years (Appendix A-8). Households are very large, with an average size of

4.26 persons. People in `Ewa Beach were much more likely to be receiving public assistance for income than the other major communities in `Ewa (Appendix A-11).

- **Barbers Point Naval Air Station (BPNAS).** Originally known as Kalaeloa, this area in the south-central portion of Hono`uli`uli, was renamed Barbers Point after Captain Henry Barber wrecked his ship on a coral shoal in 1795. BPNAS was established during World War II as a major U.S. Navy aviation facility. The station comprises 3,700 acres and operates on a 24-hour basis. There are three 7,000-foot runways which allow operation of fixed-winged and rotary-winged aircraft.

According to the 1990 Census, the air station had 2,218 residents. (In addition, the Iroquois Point military housing area, on the eastern side of `Ewa, houses about 5,000 persons.)

Military personnel stationed on-base at BPNAS numbered 4,146 in 1990, while 1,619 civilians were employed there (from special Census runs for transportation analysis, for Traffic Advisory Zone 251). BPNAS is scheduled to shut down in 1997 as part of the national Base Realignment and Closure initiative. Plans for re-use are currently under way. Navy housing and recreation areas will be retained after the Naval aviation facility closes.

In comparison to other `Ewa communities, Barbers Point residents were young with a median age of 24.7. Due to the low military wage structure, there was less difference between rich and poor at Barbers Point than in `Ewa Beach or Honolulu County as a whole (as shown by the interquartile income range, in Appendix A-11).

- **Makakilo.** Makakilo opened for occupancy in 1962, with single- and multi-family, mid-priced homes. Finance Realty is the major developer at Makakilo, which encompasses 1,202 acres. Development is more than halfway through and there will be 6,174 homes at full build-out.

Makakilo had 9,828 residents in 1990. (See Appendix A-8.) Nearly half were Caucasian. Although people have lived in Makakilo since 1962, over two-thirds of the population were recent arrivals in 1990 — 64% had moved into their homes within the five years preceding the Census (Appendix A-9).

Makakilo had higher household income levels than the other communities shown in Appendix A-11. However, costs were also high in Makakilo. Some 24% of homeowners spent 35% or more of their

incomes on housing costs, while 46% of renters spent similarly large shares of their income on housing.

- **Ewa by Gentry.** The first residents began moving into Soda Creek, the development's first subdivision, in 1988. The population of Ewa by Gentry was nearly 2,000 in 1990 (Appendix A-7). One-third of the residents were Caucasian, and about another third were Filipino. The median age was 28.4 years. Similar to Makakilo, almost 90% of Ewa Gentry residents had earned a high school diploma; 40% had a college degree.

In 1990, there were 752 houses in Ewa by Gentry. Eighty percent of the homes were owner-occupied. Owners and renters alike in this development paid the most for housing costs, compared to the other 'Ewa communities studied. Almost 40% of homeowners, and 78% of renters, paid more than 35% of their income for housing costs (Appendix A-11).

Gentry Development Company plans to build about 8,300 homes over 1,000 acres of land in Hono'uli'uli. To date, about 3,500 units have been completed. The remainder of units are scheduled to be built through 1999. Planned community facilities are: an 18-hole golf course, elementary school, two community parks, and a neighborhood community center.

- **West Loch.** This DHCD project is situated on 491 acres in Hono'uli'uli on the western edge of Pearl Harbor's West Loch. The development consists of single- and multi-family homes; 60% are affordable and 40% are in the market range. Phase I was completed in 1990, with 593 homes. A total of 1,600 residential units will be built by the end of the project. Other planned features of the community include: a commercial center, church, child care facilities, Asing Community Park within the civic center, an 18-hole municipal golf course, and a 40-acre shoreline park.
- **Kapolei.** Kapolei, which was not even counted as a Census Defined Place in 1990, is to be the regional center for 'Ewa and nearby areas.

Campbell Estate has been involved in master planning its extensive property in the 'Ewa region since 1955 when Harland Bartholomew and Associates prepared the first 'Ewa master plan. The plan was revised in the early 1960s, and updated in 1974, during which the concept of a self-contained city evolved. In 1986, Campbell Estate proposed a detailed implementation plan for a city center, bordered by Makakilo, Campbell Industrial Park, and NAS Barbers Point, and renamed it

Kapolei. The city center concept accorded with General Plan policies to develop a secondary urban center in west O`ahu.

The Kapolei Area Long Range Master Plan defines the second city as consisting of: Kapolei Villages, Kapolei Town Center, Kapolei Regional Park, Kapolei Shopping Center, Ko `Olina resort, James Campbell Industrial Park, Barbers Point Harbor, and Makakilo. Finance Realty plans to develop Kapolei Knolls mauka of Kapolei Villages. To the east, the State has identified sites for the University of Hawaii, West O`ahu and for Kapolei High School. The East Kapolei project further extends the unofficial limits of the Second City, to cover nearly half of `Ewa.

The State Housing, Finance, and Development Corporation (HFDC) is developing Kapolei Villages in conjunction with DHCD. The first homes were completed in 1990. There will be about 5,000 residential units at build-out .

Kapolei also includes:

- Offices at Campbell Square;
- A shopping center with some 25 vendors, ranging from grocery markets, service outlets, specialty shops, and fast food eateries;
- A new elementary school; and
- Many additional components under construction (i.e., the Bank of Hawaii building, with space for some 1,200 employees; a 16-screen movie theater; part of the regional park; and a child care center.) Seagull Schools expects the center to be completed in April 1995. It will accommodate 280 children, from six weeks to five years old.

Non-Residential Developments. Major employment centers, in addition to BPNAS, are James Campbell Industrial Park, Barbers Point Harbor, and the Ko `Olina Resort:

- **James Campbell Industrial Park (JCIP).** Campbell Estate developed this park as a heavy industrial complex in 1959. The entire complex stretches across 1,367 acres. Major tenants include two oil refineries, a concrete manufacturing plant, cattle feed lot operation, large building material supply yards, numerous light industrial businesses, and the City's H-POWER plant. About 75% of the park is owned in fee by its tenants.

- **Barbers Point Harbor (BPH).** The new State-owned harbor is located at the northwestern edge of the Industrial Park. Campbell Estate dedicated 89 acres to the State for the harbor. Both BPH and Campbell Industrial Park are extensions of Foreign Trade Zone No. 9. The first increment of the development was completed in 1990, and ships now make regular calls at BPH. Facilities include 1,600 feet of pier and 30 acres of paved back-up area and related infrastructure. In addition, a bulk cargo ship unloader went into use in 1992.

When harbor development is completed in the next 15 or 20 years, there will be a total of 237 acres of developed area surrounding the basin. BPH is being planned to accommodate O`ahu's shipping needs for the next 50 years.

- **Ko `Olina.** Ko `Olina is a planned resort community at the southwest end of the `Ewa region. Developer West Beach Estates has planned and created beaches and lagoons for a 1,000-acre resort. To date, one hotel and a golf course have been developed. Eventually, a maximum of 8,700 housing units could be built, and about 9,000 people employed (Personal communication: Ken Williams, West Beach Estates, August 1994). Medium-rise apartment-condominiums, low-density apartments near the golf course, and hotels are planned. The 350-400 slip marina has already been dug out and in-water facilities are to be built.

2.2.4 Community Issues and Concerns

Community Resources, Inc. reviewed Ewa Neighborhood Board Minutes from January 1992 to mid-1994, to identify recurring concerns of the `Ewa community. Major concerns expressed by Board members and the community included:

- **Development of the `Ewa Area.** This has involved discussion on the impacts of growth on the quality of life for existing communities, and promises made to those communities by developers, City, and State officials.
- **Public Infrastructure and Facilities.**
 - **Schools:** The community wants to ensure that DOE will live up to its promises to provide adequate facilities and services within a reasonable time period.
 - **Wastewater Management:** The Ewa Neighborhood Board does not have confidence in the City's prediction that the Hono`uli`uli

Sewage Treatment Plant can adequately support the planned developments in `Ewa.

- **GTE Hawaiian Telephone System:** The system does not currently have the ability to provide expanded services in the `Ewa area. GTE has promised these services by the end of 1995.
- **Traffic:** Traffic flow in and out of Leeward is hampered by the inadequate access roads (Fort Weaver Road, and the current H-1 freeway exits), and by the need for more traffic lights coming into and out of the development areas.
- **Crime.** Crime in `Ewa could be managed by the police substation in Kapolei and increased police services, according to Neighborhood Board members. Concerns included the increasing number of gangs, graffiti, and drug houses, that the Board feels could be handled by expanding youth recreational facilities and services.
- **Fire Protection.** This in `Ewa is considered adequate, but the community would prefer that the fire station planned for Kapolei be positioned close to large development tracts, such as Ewa by Gentry. Until the new fire station is built, Kapolei is served by both the Makakilo and the Waipahu Fire Stations.
- **Parks.** A central district park is sought by members of the community. HFDC has developed a master plan for the Kapolei District Park, that Kapolei residents feel is inadequate unless both night time lighting and landscaping features are included in the plan. HFDC believes that these features should be purchased and added by Campbell Estates.
- **Naval Air Station Barbers Point.** Future use of the station is an area of concern. Many residents oppose the conversion of this area into an airport, and would like the beach area to be converted into park land.

Community Resources, Inc. conducted interviews of community leaders and other representatives in September 1994, to understand what issues and concerns were most pressing to them. For the most part, the interviewees' concerns tended to reflect discussions before the `Ewa Neighborhood Board. Three concerns were mentioned most often:

- **Traffic Congestion.** Congestion is especially during peak commute hours. Interviewees looked forward to the North-South Road as a reliever for Fort Weaver Road.

- **Timing and Coordination of Infrastructure, Public Facilities, and Commercial Development with Residential Development.** Two major issues raised under this concern were:
 - Park facilities — the need for more park space and facilities, and for properly maintained parks;
 - Schools — the need for another high school and other educational facilities to meet existing and future demands in a timely manner.
- **Uncertainty about Jobs.** Several wondered whether Kapolei will become another major financial district like downtown Honolulu as envisioned, and whether the re-use of Barbers Point will generate many jobs.

Other concerns that residents mentioned were:

- Uncertainty over how the neighborhood character would change with the influx of new residents;
- The desire for a sense of community, but with little time to create it;
- The perception of a lack of political equity between `Ewa and other regions of the island, as well as power differentials between `Ewa communities;
- The need for more organized youth activities and services; and
- The capacity of the Hono`uli`uli Sewage Treatment Plant to handle current and future processing.

2.3 SECONDARY STUDY AREAS

2.3.1 Central O`ahu Development Plan Area

Central O`ahu contains both established communities that have long served as plantation towns — Waipahu and Wahiawa — and new developments. Of the new developments, Mililani Town is a planned community, with homes, a light-industrial or technological park, and a major shopping center; and Waikele includes both extensive residential areas and a major shopping center. It is located between Waipahu and other subdivisions, not as a separate community.

While Central O`ahu is much more populous than `Ewa DPA, the two areas' populations are very similar. Differences largely follow from the existence of

plantation towns in Central O`ahu. (There is no military base in Central O`ahu, but 16% of the 1990 population age 16 and over was in the armed forces [compared to 17% for `Ewa]). Central O`ahu lies between the major military bases of O`ahu, at Pearl Harbor, or Schofield Barracks, and it houses military personnel assigned to either.)

Central Oahu had more than 130,000 residents in 1990 (as shown in Appendix A-1). The age structure was very similar to that of `Ewa. As in `Ewa, about a quarter of the population was of Filipino ancestry. Caucasians formed the largest single ethnic group, but amounted to only 30% of the population (vs. 40% in `Ewa). Household incomes were slightly higher than for `Ewa households (as shown in Appendix A-4). The average household size — 33.49 persons per household — was slightly less than the `Ewa average, but still much higher than the islandwide average of 3.02 persons (Appendix A-3).

2.3.2 Wai`anae Development Plan Area

Wai`anae is relatively isolated, with one major roadway linking the region with the rest of O`ahu. Major land uses include military uses (at Lualualei and Makua valley), Hawaiian Homelands areas (in Nanakuli) and a resort in Makaha.

The region is known for a distinctive "country" lifestyle based in the Native Hawaiian culture of many residents. It stands out as more settled, with larger households than in nearby regions.

In 1990, Native Hawaiians made up 41% of the DPA population. About three-quarters of the population was born in Hawaii. The community was young, with a median age of 26.3 years. (For demographic characteristics, see Appendix A-1.)

Incomes tended to be low in the Wai`anae DPA. About a fifth of the population had incomes below the poverty line (Appendix A-4). Many renters (44%) paid a very large part of their incomes for housing costs. However, only 14% of homeowners paid over 35% of their incomes for housing, in contrast with the other DPAs under study. Unemployment was about twice as high as the islandwide average, and workers typically commuted 36 minutes to work (as shown in Appendix A-5).

2.4 EMERGING CONDITIONS

2.4.1 `Ewa in the Late 1990s

`Ewa's sugar lands are being replaced by urban development. Recent years have seen residential growth and modest retail development. However, plans call for a complete city, not a set of suburbs separated by grass lands.

The Kapolei Area Long Range Master Plan contains designs for a city similar in layout to Honolulu: a commercial and government center, surrounded by homes, with a resort area six miles from the urban center, and a commercial harbor in close vicinity.

Though projections indicate that `Ewa is the fastest growing region of all the Development Plan Areas (DPA) on O`ahu, there are several uncertainties that appear on the horizon of near-term (to 2000) and long-term (to 2010 and beyond) developments. The fundamental question is whether Kapolei will manifest as the second city.

Population and Housing. In 1990, 42,983 people, or 5% of the island's population, lived in `Ewa. As growth is directed away from the Primary Urban Center towards the Second City in leeward, forecasters predict that `Ewa's population will more than double over the next 15 years.

`Ewa is experiencing a boom in housing development. Residential construction projects began in the mid-1980s with the first phases of these projects: Ewa by Gentry, Villages of Kapolei, and West Loch. In 1990, there were 11,734 housing units. Residential construction increased in the early 1990s and will continue well into the early years of the next century. Major developments planned for the late 1990s to 2000 are:

PROJECT	UNITS
Ewa by Gentry	4,050
Ewa Marina	2,109
Ewa Villages	1,603
Kapolei	2,220
Makakilo	1,500

In `Ewa, there are about 32,000 housing units either proposed or committed by various developers through 2010. In line with predictions for the growing population, housing should increase four times faster than for all of O`ahu. Refer to Appendix A-7, for a summary of housing developments.

Employment. City planners hope for a high rate of growth in jobs for `Ewa in the next 15 years, as the Second City comes into being. The region's military facilities, tourism plant, and industrial area could provide a strong basis for jobs.

However, uncertainties loom over several projects in the area, which may affect `Ewa's employment growth projections:

- **Kapolei Civic Center.** The first Kapolei State office building is now scheduled for occupancy in early 1998 (personal communication: Joseph Earing, Department of Accounting and General Services, August 1994). Location of government offices will be phased in over the next decade or so, with substantial relocation expected by 2010. It is anticipated that civil service positions will comprise much of the 9,800 jobs projected for the Kapolei urban core (The Estate of James Campbell, October 1993).
- **The Naval Air Station at Barbers Point** is scheduled to close in 1997. Although the Navy plans to retain housing on the site, the installation's closing will result in the loss of most civilian jobs in support of existing military operations. In 1990, Barbers Point provided 56% of the jobs in the `Ewa DP area. In its new role, it is forecast to provide only about 18% of the jobs for `Ewa.

The Barbers Point Naval Air Station Reuse Committee, a group comprised of government, business, and community leaders, was formed to *consider possible uses* of the site after the base closes, and to forward their recommendations to the Secretary of Navy. Once the Navy decides on the new federal uses, the remaining property will be declared surplus, and become available for other uses. Recently, the Reuse Committee voted in favor of a proposal to keep the Coast Guard air rescue operation there, rather than relocating it to the Marine Corps Base in Kane`ohe. Possible future uses of the base are as yet undetermined, so the number of jobs that will be generated cannot be estimated

In any event, it is likely that there will be some dislocation of jobs for several years. Some jobs may be generated during the transition. These jobs are likely to be highly specialized in environmental protection and hazardous waste disposal.

- **Ko `Olina** is planned as a world-class resort community. City projections to 2010 indicate that Ko `Olina would provide 15% of the jobs in the `Ewa DP Area (Planning Department, April 1994). At build-out, the resort is supposed to employ 9,000 people.

Development has lagged behind initial plans, and no firm dates are available for construction of additional hotels or most of the proposed residential stock. Consequently, Ko `Olina is unlikely to be a major employer in the region in the near term.

- **Ewa Marina** is a master-planned resort community on 1,100 acres with one mile of ocean frontage near `One`ula Beach Park. It is to include a 1,400-slip marina and comprise a mix of: residential units, visitor units, specialty hotels, a 27-hole golf course, health and fitness center, and community-scale commercial center. Developer HASEKO (Ewa), Inc. received designation of the property for urban use by the City and County and State Land Use Commission in 1993. Final government approvals for the marina are pending. Construction is expected to start up in 1995, with a projected fifteen years till full build-out. Construction will occur in two phases. Approximately 2,000 residential units are scheduled for sometime between 1996 to 2000 and about 2,700 more units between 2001 to 2010. At build-out, there will be more than 4,800 residential units and almost 1,000 visitor units.

This timetable suggests that `Ewa Marina will generate many construction jobs in the rest of the 1990s, but few on-site operational jobs.

Until the Kapolei Civic Center, Ko `Olina, and `Ewa Marina are substantially built out and occupied, the ratio of jobs to housing in `Ewa will be low.

2.4.2 `Ewa around 2010

Population and Housing. The City and County's population projection for `Ewa in 2010 is 93,112 persons, 9.3% of the island's population.

Several of the housing developments will reach the middle or final increments by 2001. Hence, housing starts could be fewer from 2000 to 2010 than in the 1990s. Planned projects that will contribute significant increments of housing during the first decade of the 21st century are:

PROJECT	UNITS
City of Kapolei — Makai	1,000
Ewa Marina	2,335
Makaiwa Hills	1,000
Villages of Kapolei	949

Employment. For 2010, the City and County Planning Department expects that there would be some 31,312 jobs in `Ewa. The total number of jobs is small compared to Central O`ahu (projected as having 63,361 jobs in 2010), `Ewa is expected to have the highest employment growth rate of all the O`ahu DPAs (5.11% annually, as compared to 1.71% and .6% for Central O`ahu and the Primary Urban Center). This projection anticipates successful relocation of government offices to Kapolei Civic Center, formation of a strong employment

base by light and heavy industrial uses, full operation of maritime activity at Barbers Point Deep Draft Harbor, and replacement of the Barbers Point military base with a new job centers.

Other Regional Forces for Change. Two additional factors may affect the character of the region after 2000:

- **University of Hawai'i — West O'ahu (UHWO).** The University of Hawai'i (UH) Board of Regents approved the siting of the second University campus in the State's "land banked area," just west of the project area. The site encompasses 500 acres of land that is now in cane.

Though the University of Hawai'i is just beginning the master planning process, a tentative timeline for development has been outlined (Atwater, September 1994; and personal communication: Clyde Akita, UH Facilities Planning and Management, September 1994):

1996 - 1997:	Begin site preparation and infrastructure
2000 - 2001:	Complete planning, design, and site work
2000 - 2005:	Campus provides a four-year undergraduate in liberal arts with limited masters-level programs. It is expected that students will be net additions to the University of Hawai'i system.
2001 - 2045:	Campus will provide full bachelors and masters programs.
2006:	UHWO must have at least 2,650 students enrolled, or land will revert to Campbell Estate.
2010:	Enrollment of 4,000 students projected
2020:	Enrollment of 6,020 students, as projected by a City Planning Department study (Atwater, 1994).
2050 +:	The campus may have doctoral programs (Atwater, 1994).

UHWO will bring demand for on-campus student housing and off-campus housing for students and faculty. It will stimulate retail and other commercial activities, as well as create a number of jobs for the region.

- **Department of Hawaiian Home Lands (DHHL).** DHHL is working with Office of State Planning (OSP) and Department of Land and Natural Resources (DLNR) to identify public lands for transfer to their department, in order to make more developable lands available for homestead development. In `Ewa, two parcels are being considered for transfer (Office of State Planning, August 1994):

1. A 67-acre parcel owned by Campbell Estate near the intersection of Malakole Street and Kalaeloa Boulevard (TMK 9-1-15:15); and

2. Some 200 landbanked acres presently under lease to OSCo in Kapolei (TMK 9-1-16:25). This area includes the 85 acres adjoining Phase 1 along the North-South road (in Exhibit 1-B) as well as land makai of the proposed Kapolei High School, west of the North-South road. This area could be developed while, or soon after, Phase 1 of the project is developed.

2.4.3 Community Facilities/Organization

Kapolei will become the focal point of the region, with its town center, shopping center, and regional park. Campbell Industrial Park will continue as one of O'ahu's major industrial parks, and will be complemented by the development of the Kapolei Light Industrial Park. The deep draft harbor at Barbers Point should be completed in the next 15 to 20 years and will be the second seaport along O'ahu's lee coast, becoming the focal point of maritime activity for 'Ewa and west leeward communities.

As Kapolei becomes the regional hub, the surrounding 'Ewa communities will become suburbs of Kapolei, not Honolulu, to an important extent. Each of the residential developments has a distinct character; and each community has its own issues, concerns, and needs.

In 'Ewa, every residential area has a community association. Community associations of planned subdivisions are usually formed by the developer and turned over to the residents. The board of directors control and enforce the Declaration of Covenants, Conditions and Restrictions (CC&Rs), which specify standards for home maintenance and appearance in a development.

Community associations also try to spark communal life and encourage resident participation. Associations have formed Neighborhood Security Watches, graffiti removal task forces, craft fairs, pot lucks, *ho'olaule'a*, and youth activities and programs.

The 'Ewa Neighborhood Board is the primary forum through which representatives of the different community associations interact to discuss local and regional issues. In recognition of the growing population of Makakilo and Kapolei, the Neighborhood Board Commission approved a resolution to reduce the jurisdiction of the 'Ewa Neighborhood Board and establish Board 34, covering Makakilo, Kapolei, Barbers Point, and Honokai Hale communities (West Oahu Current, September 1994). The 'Ewa Neighborhood Board will continue to represent 'Ewa Beach, 'Ewa Villages, Ewa by Gentry, and the West Loch projects.

Aside from Neighborhood Board participation, the communities now come together for an annual Christmas parade, which is sponsored by the `Ewa Beach Professional Business Association and the `Ewa Beach Community Association.

A proposed regional park at Barbers Point that is being considered as a possible re-use of the naval base could be an asset and major attraction of the region. The subcommittee on parks of the Barbers Point Re-use Committee has recommended that 1,200 acres of the naval air station be dedicated for a regional park. The Re-use Committee's planner has indicated that at least 800 acres could be dedicated to park use, whatever else is planned for Barbers Point (public communication: Mark Hastert, September 29, 1994). The park could permit diverse activities at ball fields, spaces for flying model airplanes and sailing model boats, and ocean recreation areas

A sense of regional identity will likely manifest as Kapolei emerges. Still, it is also likely that the various residential communities, both existing and upcoming, will retain separate and distinctive identities. The division of the Neighborhood Board into two boards and the limited cooperation achieved to date among local community associations suggest that `Ewa-wide community organization will be difficult.

Regional identity may also go beyond the limits of the `Ewa DPA. UHWO could be a focus for regional allegiance, especially if the University establishes an athletics program there. There is no reason, however, why Wai`anae and Waipahu residents would feel less a part of the UHWO community than `Ewa residents.

2.4.4 Neighboring Regions

Central O`ahu. The Central O`ahu DPA follows `Ewa as one of the leading growth areas on the island. The year 2010 population is forecast as above 169,000, or about 17% of the island's population.

Major growth areas are located near Mililani and on the mauka side of Waipahu. Near Mililani, Mililani Mauka is planned to include 6,600 units of which about 2,000 have been built. In Launani Valley, some 300 units have been built, of a planned total of 1,000. Nearby, the Mililani Technology Park is still being developed.

Near Waipahu, Waikele has permits to build 3,000 homes (of which 1,600 are now standing). The Royal Kunia project is planned to include eventually some 3,700 units, if permits are gained for both phases. At Waiawa Ridge, the Gentry Corporation proposes building some 2,675 units between 1996 and 2000.

AMFAC/JMB is proposing development of a light industrial park near the O`ahu Sugar Mill in Waipahu. This would likely bring more jobs to the area than OSCo now provides.

Wai`anae. Wai`anae's growth is forecast by the City as modest in comparison to `Ewa and Central O`ahu. By 2010, Wai`anae is expected to have about 5% of the island's population, with over 45,000 people. While this is a "country" area, new housing projects will house much of the regional population growth:

- **Ma`ili Kai.** Schuler Homes has zoning approvals to build some 1,300 homes in Ma`ili (of which about 160 have been built).
- **Village Poka`i Bay.** A total of about 510 single-family homes are planned for this Wai`anae `ahupua`a project. More than 150 of these units have already been built.

The City's forecasts for Wai`anae do not fully allow for historic patterns of natural increase and large households seen there in recent decades. Two other issues add to uncertainty in forecasting:

- **Department of Hawaiian Homelands (DHHL).** In Wai`anae, DHHL has over 1,600 acres, with about 3,400 house lots in varying stages of planning. About 2,200 of those house lots sit at the back of Nanakuli (Nanakuli Valley Estates), with the remainder in Wai`anae and Ma`ili. Some 420 lots are in projects for which infrastructure and home construction are under way. No timeframe is now available for development of the other lots (personal communication, Darryl Ing, Land Agent, Master-Planned Community Branch, DHHL, November 1994). Plans are conceptual at this stage, since the Department lacks funding. However, the Department could acquire new funds in the coming years.

In addition, DHHL has identified almost 870 acres of grazing land in Wai`anae Valley and 15 acres in Nanakuli, that may be transferred over from the Department of Land and Natural Resources (Office of State Planning, August 1994).

- **Ko `Olina.** As noted earlier, it is uncertain when the bulk of this project, at the entry to the Wai`anae Coast, will be developed. The 9,000 jobs anticipated there are a significant resource for Wai`anae DPA residents as well as `Ewa. If resort development does not proceed, no major new job center will be closer to Wai`anae than to the housing areas of `Ewa.

Section 3 ECONOMIC AND DEMOGRAPHIC IMPACTS

After an introduction to the impact analysis, this section addresses questions concerning employment, income, population, housing, and fiscal impacts of the proposed project. More general socio-economic impacts (including impacts of locating the proposed population on site) are assessed in section 5.

Current plans call for construction of Phase I from 1996 through 2004 and production of Phase II homes between 2005 and 2011. Products proposed for the two phases are identical, so the cumulative employment, income, population, and fiscal impacts of each phase is half the total impact of the project. (As noted in Section 1, the 27 acres of commercial land in Phase 2, to be controlled by the Estate of James Campbell, are excluded from the analysis.)

Nearly all homes would be sold and occupied by 2012, as shown in Exhibit 3-A. By 2015, occupancy and resident population would peak.

The project would generate construction jobs and would provide a site for operations jobs, above all in the commercial areas. The project's impact on government revenues would be positive. The State would gain significant revenues from construction, while City and County revenues would continue after the project builds out. The developer expects to bear significant costs for off-site infrastructure. By shouldering its share of those costs, Schuler Homes, Inc. will help government agencies to develop nearby parcels dependent on the same or related infrastructure. Even if the developer's costs are calculated strictly in terms of the share of infrastructure to be used by project residents, the project's participation in infrastructure planning and development will lower government costs for development of the North-South road, UHWO, and Kapolei High School.

3.1 THE CONCEPT OF "IMPACT" AND THE EAST KAPOLEI PROJECT

In socio-economic impact analysis, an impact is the difference between two possible futures, with and without the proposed project, rather than the difference between present conditions and future ones with the project. Yet, for members of the surrounding community, the difference between the current situation and the future can profoundly affect perceptions of any project. Again, perceptions are often shaped by experience with recent projects, which may have little to do with the proposed action.

Impacts must be assessed in relation to context. A change brought by a project may be highly significant at a local level, yet small or a regional or county scale.

**Exhibit 3-A
PROJECT CONSTRUCTION, SALES, & OCCUPANCY**

	1997	2000	2005	2010	2015
UNITS BUILT					
During Year	400	750	500	750	0
Cumulative	400	2,650	5,500	9,250	10,000
Phase 1	400	2,650	5,000	5,000	5,000
Phase 2	0	0	500	4,250	5,000
UNITS SOLD (1)					
During Year	200	736	381	749	0
Cumulative	200	2,155	5,206	8,750	10,000
Phase 1	200	2,155	4,956	5,000	5,000
Phase 2	0	0	250	3,750	5,000
UNITS OCCUPIED (2)					
Cumulative	0	1,348	4,584	7,601	9,500
RESIDENT POPULATION (3)					
Phase 1	573	6,137	14,696	24,501	28,000
Phase 2	0	0	706	10,501	14,000

- NOTES: (1) Estimated on assumption that 50% of units delivered in each year are sold in that year, and 75% of unsold inventory is sold in the year.
(2) Estimated on assumption that 95% of units sold through the end of the previous year will be occupied.
(3) Estimated from Planning Department analysis of 1990 and expected 2010 average household size for comparable developments — West Loch and Ewa by Gentry (2.90 in 1990, and 2.80 in 2010). This approach allocates population to all units, including vacant ones. After 2010, household size is held constant.

SOURCE: Honolulu Planning Department, 1993b.

It is useful to distinguish locational impacts from absolute ones. An absolute impact is a change that will occur with a project, but would not occur otherwise; a locational impact will occur, but would not occur at the site of a project, or would perhaps be dispersed over a large area, without the project.

The East Kapolei residential project responds to a recognized need on O'ahu for housing. From an economic perspective stressing the local economy, industries such as tourism bring new inputs into the economy which might otherwise go outside Hawaii; these are primary causes of change. With an economy supported by such primary industries, people may be housed in various ways, in different places — but they must be housed. The impact of a major residential project has to do with where people are housed, not whether there will be economic and population growth.

3.2 EMPLOYMENT

The project involves short-term jobs related to construction and long-term jobs associated with continuing operations. Employment impacts for both construction and operations are of three types:

- Direct jobs are immediately involved with construction of a project or with its operations. Direct jobs are not necessarily on-site: construction supports construction company personnel in offices and base yards, as well as on site.
- Indirect jobs are created as businesses directly involved with a project purchase goods and services in the local economy.
- Induced jobs are created as workers spend their income for goods and services.

Indirect and induced employment in Hawaii can be estimated using multipliers from a model of input-output relations in Hawaii's economy developed by State researchers.

Exhibit 3-B CONSTRUCTION EMPLOYMENT

	Annual Averages:				Cumulative, 1996-2011
	1996-2000	2001-2005	2006-2010	2011	
Construction Spending (Millions \$\$) (1)	\$96.52	\$88.79	\$111.01	\$57.61	\$1,539.20
Direct Jobs (2)	824	758	947	492	13,134
Indirect & Induced Jobs (3)	1,783	1,640	2,051	1,064	28,431
TOTAL CONSTRUCTION-RELATED JOB	2,606	2,398	2,998	1,556	41,565

- NOTES: (1) Estimate does not include land, planning, marketing, sales, and other costs.
 (2) Estimated from relation between construction spending and workforce (on average, from 1993 construction put in place and construction workforce data) — 8.53 jobs per million dollars spent on construction.
 (3) Estimated on basis of unpublished DBEDT Input-Output Model. Employment multiplier of 2.16 is a weighted average of multipliers for single-family (2.29), multi-family (2.17), heavy (1.97) and commercial (1.76) construction

SOURCES: Bank of Hawaii 1994; Unpublished tables, Department of Business, Economic Development and Tourism.

Construction. The East Kapolei project will support a large number of construction jobs from 1996 through 2011. (See Exhibit 3-B above.) The cumulative total for the entire 16-year period is about 13,100 direct full-time person-years of employment and some 28,400 person-years of indirect and

induced jobs. Direct construction jobs are estimated as averaging 750 or more full-time jobs annually through 2010.

(The number of construction jobs varies from day to day for any project, and from year to year as different phases of a project are built out. Construction jobs are estimated in terms of an average number of jobs supported over a period of time, and measured in person-years, since these jobs come to an end when the project is built. Indirect and induced jobs related to construction are similarly limited in duration, since project construction will no longer support these jobs after buildout.)

Since about 80% of construction jobs are, as a rule, located at the job site, the project would provide at least 600 full-time construction jobs on-site for nearly the entire construction period.

Exhibit 3-C OPERATIONS EMPLOYMENT

	1997	2000	2005	2010	2015
DIRECT JOBS					
Real Estate Sales (1)	20	50	29	50	0
Property Management, Maintenance (2)	8	53	110	185	200
Commercial (3)	87	174	436	610	697
SUBTOTAL A	115	277	575	845	897
DIRECT JOBS, BY INDUSTRY (4)					
Finance	24	76	84	142	100
Agriculture (Landscaping)	4	27	55	93	100
Retail Trade	70	139	348	488	558
Automobile, Miscellaneous Services	17	35	87	122	139
INDIRECT & INDUCED JOBS ASSOCIATED WITH DIRECT JOBS IN:					
Finance	24	76	84	142	100
Agriculture (Landscaping)	2	12	25	42	45
Retail Trade	40	79	199	278	318
Automobile, Miscellaneous Services	8	17	42	59	67
SUBTOTAL B	74	184	350	521	530
TOTAL OPERATIONS-RELATED JOBS (A + B)	189	461	925	1,366	1,427

- NOTES: (1) Based on an estimated ten jobs per 100 unsold units in inventory.
 (2) Based on an average of 2 jobs per 100 units built.
 (3) Based on average of 4 jobs per 1,000 square feet of commercial space, assuming a net buildable area of 20% of the commercial acreage.
 (4) Allocation of jobs to industry categories by Community Resources, Inc. Indirect and induced jobs supported by operations jobs from unpublished State Input-Output model Type II employment multipliers for these industries.

Operations. (See Exhibit 3-C above for details.) Most direct on-site operations jobs would be located in the commercial areas in the project. As

stores are built, the workforce would grow to about 900 workers. An additional 500 indirect and induced workers would be supported by spending by direct operations enterprises and workers.

The project will provide housing for Oahu residents, who will patronize local stores and shops wherever they live. Most of the operations jobs associated with project residents' spending would exist somewhere on Oahu in any event. They are not created by the project. Hence these operations jobs do not strictly speaking count as an "impact" on employment islandwide. However, the location of some of these jobs in ʻEwa — jobs at the neighborhood commercial areas at the project (counted in Exhibit 3-C), and in other commercial areas, such as the Kapolei Shopping Center — is an impact of the project.)

3.3 INCOME

Personal incomes of the workforce associated with the project are estimated in Exhibit 3-D. Direct construction workforce incomes will average about \$35 million annually from 1996 through 2010. Annual incomes from direct, indirect, and induced jobs associated with construction will average \$75 million or more during this period. Direct operations incomes will grow to total over \$10 million annually by 2010. These will be divided equally between operations in Phase I and Phase II.

**Exhibit 3-D
PERSONAL INCOME ASSOCIATED WITH PROJECT-RELATED JOBS**

	Annual Average Income (Millions \$s):			
	1996-2000	2001-2005	2006-2010	2011-2015
DIRECT JOBS				
Construction (1)	\$35.4	\$32.5	\$40.7	\$5.3
Operations	\$2.7	\$6.8	\$10.7	\$12.4
INDIRECT AND INDUCED JOBS				
Construction (1)	\$48.0	\$44.1	\$55.2	\$7.2
Operations	\$2.9	\$7.8	\$12.4	\$14.6
TOTAL PERSONAL INCOME	\$88.9	\$91.2	\$118.9	\$36.9

NOTES: Income estimates from reports of statewide average income by industry, with jobs allocated by industry as shown in Exhibit 3-C. Average wages for 1992 increased in proportion to changes in CPI-U between 1992 and 1994, to estimate 1994 average wages. Indirect and induced employment wages estimated from statewide average annual wage, all covered employment

(1) With construction ending in 2011, the average construction income for the five-year period is lowered by four years without such income.

SOURCES: Hawaii Department of Labor and Industrial Relations, 1993; Bank of Hawaii, 1994b.

3.4 POPULATION AND HOUSING

Residential Population. The project will provide a mix of multifamily and single-family housing comparable to that found in other major new projects in Ewa and Central Oahu. Future population of the project can be estimated on the basis of the buildout schedule and estimates of average future household size. By 2000, the project is expected to house more than 6,000 persons in Phase I.

By 2010, the on-site residential population would climb to 24,500 — 14,000 in Phase I and 10,500 in Phase 2. At buildout, the total population would be about 28,000 in both Phases. (As noted in Exhibit 3-A, average household size is expected to be about 2.8 persons per household by 2010. No further reduction in household sizes after 2010 has been assumed.)

De Facto Population. The project does not include facilities to attract persons from other areas. Hence it would have few or no visitors, and the peak population on-site would be the resident population.

**Exhibit 3-E
POPULATION & HOUSING ASSOCIATED WITH PROJECT-RELATED JOBS**

	1997	2000	2005	2010	2015
OPERATIONS JOBS (1)					
Total Direct Jobs	115	277	575	845	897
Total Indirect & Induced Jobs	74	184	350	521	530
LEEWARD OAHU SHARE OF JOBS (2)					
Direct Jobs	112	269	571	837	897
Indirect & Induced Jobs	15	40	87	147	171
WORKFORCE-SUPPORTED POPULATION (3)					
Statewide	391	954	1,914	2,827	2,953
Leeward Oahu	263	640	1,360	2,038	2,211
WORKFORCE HOUSEHOLDS (4)					
Statewide	130	316	634	936	978
Leeward Oahu	87	212	450	675	732
EVENTUAL NEW HOUSING DEMAND (5)					
Low Range, Statewide	19	47	95	140	147
Low Range, Leeward Oahu	13	32	68	101	110
High Range, Statewide	39	95	190	281	293
High Range, Leeward Oahu	26	64	135	202	220

NOTES: (1) From Exhibit 3-C.

(2) Estimated on assumption that 85% of real estate sales jobs are on site, and all other direct operations jobs are on site. Regional share of indirect and induced jobs is estimated as 20% at first, but as increasing to 32.4% in 2015. This increase in regional share (at a rate of 2.7% annually) derives from a weighted average of the Planning Department's projection of growth in support jobs in the region by 2010

(3) Assumes 2.07 persons per operations job, based on 1990 County average of 1.46 workers per household.

(4) Based on 1990 County average of 3.02 persons per household.

(5) Assuming that 15% of low range & 30% of high range worker households will eventually require new housing.

Population Supported by Project-Related Jobs. Project-related jobs would support nearly 3,000 persons statewide at buildout, most of whom would likely live in Leeward Oahu. By the buildout of both phases of the project, some 730 workforce households in Leeward Oahu — nearly 1,000 statewide — would be associated with direct, indirect, and induced project-related jobs. Housing for these workers, and “new” units for workers who are establishing new households, will amount to a small fraction of the housing to be supplied by the project.

(See Exhibit 3-E on preceding page for details. Demand for “new housing” is really for additional housing units, as workers form new households. The extent of new housing demand depends on housing prices and availability. Hence it is estimated here as a range between low and high points.)

Population and Housing in Relation to City and County of Honolulu Policy. Both the City and County of Honolulu and the State of Hawaii support the development of a Second City in `Ewa. Exhibit 3-F shows the population guidelines established by the City for the various DPAs. It reflects a policy of fast-paced growth for `Ewa, and slow growth or decline in population for most other regions.

The `Ewa DP Area is one of two in which substantial new housing is proposed in the coming years. Land has been designated for extensive new housing developments. However, development of several major projects has been much slower than proposed. City planners recognize that the population of the area is likely to fall well below the guidelines established in the General Plan for 2010:

Year 2010 Population in `Ewa: Policy vs. Projection

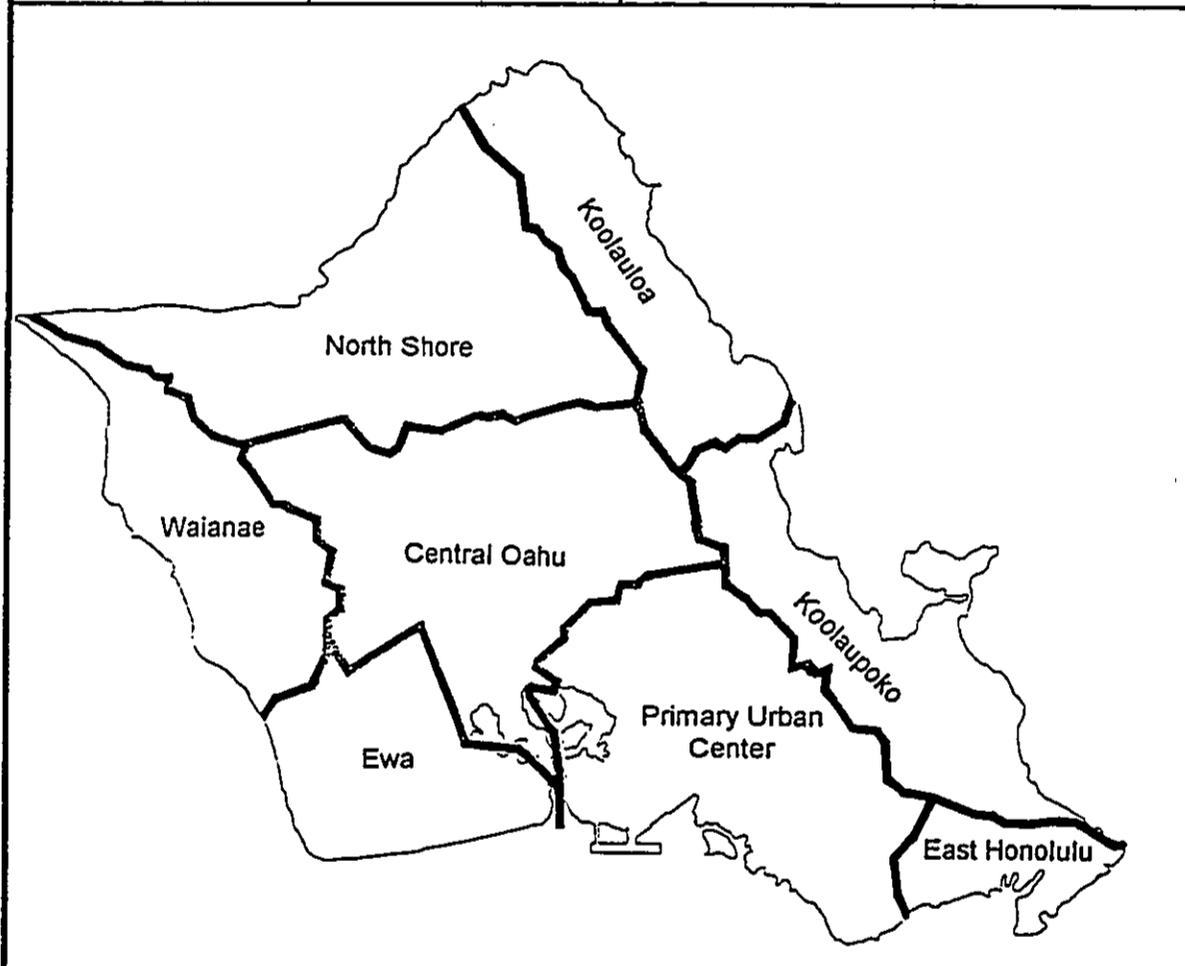
	Share of Island Population	Yr. 2010 Population
General Plan Policy	12.0% to 13.3%	119,900 to 132,900
Planning Department Forecast	9.3%	93,112
Difference		26,788 to 43,788

SOURCE: Honolulu Planning Department, 1994.

The additional population anticipated with the project — 24,500 as of 2010 — would raise the `Ewa DP area population to a point near the General Plan guidelines. Hence the project would help to keep population growth in other areas, where population projections are higher than the General Plan guidelines, closer to the guideline levels.

**Exhibit 3-F
TARGET POPULATIONS FOR DEVELOPMENT PLAN AREAS**

	1990 Actual		2010 Targets	
	Resident Population	Actual % of Total	Projected Range of Population (1)	Target % of Total
OAHU TOTAL	836,231	100.0%	949,500 to 1,049,500	95.0% to 105.0%
Primary Urban Center	432,023	51.6%	450,800 to 497,800	45.1% to 49.8%
Ewa (2)	42,983	5.1%	119,900 to 132,900	12.0% to 13.3%
Central Oahu	130,474	15.6%	148,900 to 164,900	14.9% to 16.5%
East Honolulu	45,654	5.5%	53,000 to 58,000	5.3% to 5.8%
Koolaupoko	117,694	14.1%	109,900 to 121,900	11.0% to 12.2%
Koolauloa	14,263	1.7%	13,000 to 14,000	1.3% to 1.4%
North Shore	15,729	1.9%	16,000 to 18,000	1.6% to 1.8%
Waianae	37,411	4.5%	38,000 to 42,000	3.8% to 4.2%



NOTES: (1) Population ranges based on target percentages specified in the General Plan and the Hawaii State DBED Series M-K population projection of 999,500 for the year 2010.
(2) Includes study area.

SOURCES: U.S. Bureau of the Census, 1991; Honolulu City & County, 1989.

Response to Pent-Up and Continuing Housing Demand. A separate market study (Atwater, 1994) has established that demand for the housing proposed in the project will be strong enough to build the entire project by the end of 2011. The project responds largely to islandwide demand, but also is situated to meet local demand for housing from University of Hawaii faculty and students.

3.5 IMPACTS ON GOVERNMENT REVENUES AND COSTS

The project is planned to provide housing for Hawaii residents. Hence it generates no new capital flows from out of state, and will not attract new residents to Hawaii. It is an indirect effect of the overall growth of the island and State economies, not a new stimulus. This means that the project's impact on government revenues and costs is limited to the effects of building the specific components of the project, and building them on its site.

Project-related additions to government revenues can be estimated in detail. The City and County will gain new property tax revenues amounting to over \$6.3 million annually as of buildout, and the State will gain about \$105 million in taxes from construction-related spending over the construction period. Government costs are much more difficult to estimate. Still, this project will so clearly help the State by lowering initial development costs of nearby State projects that the net cost of the project for government is likely to be minimal or nil. Hence the overall impact of the project will be to increase government revenues, as described below.

3.5.1 Revenues

City and County of Honolulu. City and County revenues from the project would mainly derive from real property taxes on developed land and buildings. Exhibit 3-G on the following pages provides an estimate of the tax revenues from the project. By 2000, annual revenues would reach \$1.8 million (1994 dollars). The annual tax revenues would climb to \$6.0 million in 2010, and to \$6.5 million at buildout. In contrast, only \$171,000 could be raised in taxes annually from the property under its current use. At buildout, then, property taxes on the project would amount to a \$6.3 million increase over current taxes.

(Exhibit 3-G derives from the construction and occupancy schedule in Exhibit 3-A. It calculates the land area developed, and then the value of developed and undeveloped land in the project. Development values are estimated from construction values and estimated sales value of this and similar projects. The estimated land value is adjusted to allow for owner-occupant exemptions, after which taxes are calculated on the basis of 1994-1995 tax rates.)

**Exhibit 3-G
REAL PROPERTY VALUES & TAXES, SCHULER EAST KAPOLEI**

	1994 (1)	1997	2000	2005	2010	2015
A. AREAS (Acres)						
ACREAGE TO BE DEVELOPED (2)	875	837	642	394	68	0
Unimproved Residential (Phase 1)	437	399	204	0	0	0
Agricultural (Phase 2)	438	438	438	394	68	0
NEWLY DEVELOPED ACREAGE (ANNUAL)						
Improved Residential		17	28	16	28	29
Apartment		19	36	25	36	36
Commercial		3	0	3	0	3
CUMULATIVE DEVELOPED						
Improved Residential		17	101	201	341	370
Apartment		19	127	267	449	485
Commercial		3	5	13	18	20
TOTAL AREA DEVELOPED		38	233	481	807	875
B. VALUES (\$1,000s)						
ACREAGE TO BE DEVELOPED (2)						
Unimproved Residential (Phase 1)		\$33,920	\$17,355	\$0	\$0	\$38
Agricultural (Phase 2)		\$1,094	\$1,094	\$984	\$170	\$0
ANNUAL NEW DEVELOPED LAND VALUE						
Improved Residential		\$7,877	\$12,799	\$7,548	\$12,799	\$13,456
Apartment		\$15,282	\$30,215	\$20,956	\$30,215	\$29,693
Commercial		\$861	\$0	\$861	\$0	\$861
CUMULATIVE DEVELOPED LAND VALUE						
Improved Residential		\$7,877	\$46,274	\$92,549	\$156,546	\$170,001
Apartment		\$15,282	\$105,928	\$222,681	\$373,756	\$403,449
Commercial		\$861	\$1,722	\$4,306	\$6,028	\$6,889
ANNUAL NEW IMPROVED VALUE						
Improved Residential		\$26,323	\$42,776	\$25,227	\$42,776	\$44,969
Apartment (New Units)		\$39,723	\$77,860	\$54,119	\$77,860	\$76,532
Apartment (Buybacks) (3)		\$0	\$0	\$0	\$270	\$270
Commercial		\$1,851	\$0	\$1,851	\$0	\$1,851
CUMULATIVE IMPROVED VALUE						
Improved Residential		\$26,323	\$154,651	\$309,301	\$523,179	\$568,149
Apartment		\$39,723	\$273,302	\$574,069	\$964,308	\$1,041,110
Commercial		\$1,851	\$3,703	\$9,257	\$12,959	\$14,811
TOTAL VALUE (LAND + IMPROVED)		\$125,838	\$602,935	\$1,212,163	\$2,036,776	\$2,204,447

Exhibit 3-G (continued)

	1994 (1)	1997	2000	2005	2010	2015
C. EXEMPTIONS (\$1,000s) (4)						
VALUE						
Improved Residential		\$4,800	\$28,200	\$56,400	\$95,400	\$103,600
Apartment		\$11,200	\$77,800	\$163,600	\$274,600	\$296,400
CUMULATIVE TAXABLE LAND VALUE						
Improved Residential		\$3,077	\$18,074	\$36,149	\$61,146	\$66,401
Apartment		\$4,082	\$28,128	\$59,081	\$99,156	\$107,049
D. TAXES (\$1,000s)						
ACREAGE TO BE DEVELOPED (2)						
Unimproved Residential (Phase 1)		\$133	\$68	\$0	\$0	\$0
Agricultural (Phase 2)		\$10	\$10	\$9	\$2	\$0
DEVELOPED LAND VALUE						
Improved Residential		\$10	\$56	\$113	\$191	\$207
Apartment		\$14	\$99	\$208	\$349	\$377
Commercial		\$7	\$0	\$0	\$0	\$0
IMPROVED VALUE						
Improved Residential		\$103	\$606	\$1,212	\$2,051	\$2,227
Apartment		\$140	\$962	\$2,021	\$3,394	\$3,665
Commercial, Industrial		\$0	\$0	\$0	\$0	\$0
TOTAL TAXES		\$417	\$1,802	\$3,563	\$5,987	\$6,476
E. INCREASE IN TAX REVENUES (\$1,000s)						
TAX REVENUES BEFORE PROJECT (5)	\$171					
DIFFERENCE IN TAX REVENUES						
Total Annual Taxes		\$246	\$1,631	\$3,392	\$5,816	\$6,305
Total Cumulative Taxes		\$246	\$3,755	\$17,896	\$42,126	\$73,652

- NOTES:** All figures in thousands of dollars, except Areas (in acres).
- (1) Acreage "to be developed" is taxable area, excluding schools, parks, roads. Analysis based on increase in value from time of acquisition by Galbraith Estate and Schuler Homes. Hence Phase 1 is treated as Unimproved Residential in 1994, rather than Agricultural, because Urban classification of that land is a precondition to the proposed State land exchange.
 - (2) Agricultural value for Phase 2 land estimated on assumption of use for diversified agriculture up to the time of development.
 - (3) Taxable value of low-income and gap-group units assumed to be constrained by buybacks for ten years, after which it would rise to market value.
 - (4) Standard homeowner's exemption (\$40,000) assumed for all units.
 - (5) This calculation assumes that all project land is taxed, based on classification. This is an estimate of maximal tax revenues, since it assumes that taxes would be paid for Phase 1 as Urban, even though the State rather than a private taxpayer owns the land in 1994.

SOURCES: Honolulu City and County 1994-1995 real property tax rates; City and County tax records.

State of Hawaii. The State will gain revenues deriving from project construction. These revenues will average well over \$6 million annually during the construction period, and add up to some \$105 million (1994 dollars) as of buildout:

**Exhibit 3-H
STATE REVENUES ASSOCIATED WITH PROJECT CONSTRUCTION**

	Annual Average Revenues (Thousands \$s):			
	1996-2000	2001-2005	2006-2010	2011
EXCISE TAXES				
Construction Spending (1)	\$3,861	\$3,552	\$4,440	\$2,304
Construction-Related Workforce Spending (2)	\$1,077	\$991	\$1,239	\$643
CORPORATE INCOME TAX (3)				
Construction (3)	\$241	\$222	\$278	\$144
PERSONAL INCOME TAX (4)				
Construction-Related Workforce Incomes	\$1,429	\$1,314	\$1,643	\$853
TOTAL TAXES	\$6,608	\$6,079	\$7,600	\$3,944

NOTES: Cumulative total revenues, 1996-2011: \$105.4 million

- (1) Calculated at 4% of direct construction spending.
- (2) Calculated at 4% of workforce income spent on taxable items. Disposable income estimated from 1988-1989 U.S. Bureau of Labor Statistics Survey.
- (3) Calculated at 0.25% of construction spending, from 1989-1990 data on business receipts and corporate income taxes collected.
- (4) Calculated at 4.04% of wages.

SOURCES: Hawaii Department of Business, Economic Development and Tourism, 1992; Hawaii Department of Taxation, 1992; Tax Foundation of Hawaii, 1992, 1991.

3.5.2 Costs

Because the project will not attract new residents, it will not add to the population served by the City and County. Hence it will have little or no impact on City and County operating costs.

Often, government personnel have expressed concern that new development can add to government costs due to: (a) demand for capital improvements; and (b) added costs in delivering services to out-of-the-way locations. The East Kapolei project will add few costs due to this sort of locational impact. Instead, its locational impact on government costs will be positive:

- As part of the planned development of `Ewa, the project will contribute to the funding of already-planned capital improvements, rather than force public funding of improvements which would otherwise be unneeded.
- By helping to bring the planned population to `Ewa, the project will help to make delivery of government services — many of which will be based in `Ewa, with or without the project — more cost-effective.

As a participant in planning and development of infrastructure for central `Ewa, the project will likely lower government costs. That is because the State is committed to major infrastructure improvements, notably the North-South road. The road must be built in the next few years if UHWO is to enroll 2,650 students on site by 2006 and thereby retain its land.

If the East Kapolei project were not proposed, and the project site remained undeveloped, the State would have to cover any costs of infrastructure development ascribable to the project site, and hope eventually to charge a future developer for those costs. The State would, at the very least, need to carry interest charges which would likely not be fully paid by a future developer.

Similarly, drainage problems affect State land, the project site, and DHCD's `Ewa Villages project. The project developer will have to address them now, making a coordinated approach to a regional problem possible.

The development costs at issue are significant. For example, the North-South road and its H-1 interchange have been estimated as costing \$52.8 million (1991 dollars) (Pacific Planning and Engineering, 1992). The final cost will likely be greater than that figure. Hence the impact on State finances of the project developer's participation in regional development will be substantial.

Section 4 PUBLIC FACILITIES

This section describes existing and expected public services and facilities in the `Ewa vicinity. It then provides an analysis of the impact of the proposed development on:

- Public safety (police and fire services);
- Medical facilities and services;
- Recreation;
- Education; and,
- Libraries.

4.1 PUBLIC SAFETY

4.1.1 Police

Existing Services and Facilities. Currently, the Pearl City Police Station covers the area from Red Hill to Kahe Point in Honolulu Police Department's District 3. There are five beats in the `Ewa area with one officer per beat, 24 hours a day, seven days a week. One sergeant is included for each beat. The police officers assigned to the `Ewa area work with the community through two channels: the volunteer Neighborhood Security Watch and the Community Policing Team (CPT). The latter is a modern police effort to directly involve the community with police crime prevention efforts, such as painting over gang-related graffiti or referring families with potential abuse problems to appropriate services.

Planned Services and Facilities. The Captain of the Pearl City Station is confident that existing police services to the `Ewa area are sufficient at this time, given the current level of demand for services (personal communication, Captain Chastain, City and County Police Department, Pearl City Station, Administrative Captain and Executive Director, August 1994). However, because of the anticipated growth in the area, an additional substation will be added in the Kapolei area. In 1995-1996, the number of beats will be increased to nine, and the officers on duty will increase to 22.

Current crime problems include the following:

- Property crimes — burglary and theft; and
- Graffiti, which the Community Policing Team (CPT) is addressing with residents.

Crime in the `Ewa area includes gang-related incidents and some drug house problems. These crimes tend to be located in the older `Ewa Beach community.

Impact of Project. Captain Chastain does not expect the project to affect police services to this area, if police planning for increases in number of police beats to this area and an expanded Leeward Police Station is met. The Captain anticipates that another police district will be created by the time the proposed project reaches build-out. The new Kapolei Police Substation should meet any increased demand for police services in the project area. When the new police district is created, the current Wai`anae Station will serve `Ewa (Makakilo, Honokai Hale, `Ewa Beach, and Kapolei) and the Wai`anae Coast area. The Pearl City Station will then serve Halawa Heights to Waipahu.

4.1.2 Fire

Existing Facilities. `Ewa is served by three fire stations:

- Makakilo Station serves Makakilo, upper Kapolei, and Ko Olina Estates (Honokai Hale and Nanakai Gardens may call on either Nanakuli Fire Station or Makakilo);
- The Waipahu Station serves lower Kapolei, `Ewa by Gentry, and `Ewa area to Renton Road; and
- The `Ewa Beach Fire Station serves all of lower `Ewa Beach up to Renton Road.

The Waipahu Station has 23 fire fighters on a 24-hour rotating shift, with all equipment and trucks necessary for emergency calls. The Station Captains find they have sufficient resources to respond quickly to emergency calls. (Personal communication, Captain Souza, `Ewa Beach Fire Station and Captain Monayre, Waipahu Fire Station, August 1994.) The Waipahu Station assists the `Ewa Beach Station when needed.

Typical calls are for brush fires, property damage, and medical emergencies.

Planned Services. A new firehouse will be added to Kapolei in December 1994 to serve the `Ewa Plain. The fire station will be fully equipped and manned.

Impact of Project. According to the two captains interviewed, the increased need for fire services resulting from the proposed development will be easily managed by the planned Kapolei Fire station. Fire Department plans for increased service have taken into account proposed residential development in the `Ewa area.

4.2 MEDICAL FACILITIES AND SERVICES

Existing Facilities and Services. St. Francis-West is the full-service hospital closest to the proposed development. It is approximately five to 15 minutes from the project site, depending on traffic conditions. Ambulance service is coordinated with the City and County, and the hospital has a helipad. St. Francis-West offers a full range of hospital services, including emergency care, outpatient treatment, laboratory and X-ray facilities, and medical offices.

The hospital has 79 licensed beds available. The hospital anticipates expanding bed capacity to 84 beds. (Personal communication, Phil Baltch, St. Francis Medical Center-West, Chief Operating Officer, January 1994.) The hospital is operating at about 80% capacity. In a 20- to 30-minute drive, emergency services are also offered by Wai`anae Coast Comprehensive Health Center (which also has a helipad), Pali Momi Medical Center (a division of Kapiolani Women and Children's Hospital) at Pearl Ridge, and Wahiawa General Hospital.

Non-emergency services are provided by local general physicians and specialists in the area, as well as by three medical clinics: Kaiser Permanente at Punawai in Waipahu, West-Side Women's Health Care Clinic and `Ewa Beach Medical Clinic both located on Fort Weaver Road in `Ewa.

Impact of Project. According to St. Francis West, the demand for hospital services by residents of the Schuler development can readily be absorbed by the hospital, because of two factors: (1) the facility can be expanded — it currently uses only a small portion of its total 23 acres; (2) the length of hospital stay by traditional users (such as women giving birth) has been declining over recent years, and is projected to decline even further in the future. (Personal Communication, Phil Baltch, St. Francis Medical Center-West, Chief Operating Officer, August 1994).

4.3 RECREATION

Existing Facilities. Several parks and other recreational facilities are located in the general vicinity of the proposed development: `Ewa Mahiko Neighborhood Park, Pu`uloa Neighborhood Park, Makakilo Community Park, Geiger Park Gentry, West Loch 18-hole Municipal Golf Course, Asing Park (part of West Loch Estates), and the newly created Kapolei Park. Most of the beaches in `Ewa are not staffed by City and County lifeguards. These include Iroquois Beach, One`ula Beach, `Ewa Beach Park, West Loch Shoreline Park, and `Ewa Plantation Beach. Barbers Point Beach Park and Nimitz Beach are restricted to military use. `Ewa currently lacks a recreation director and after-school services on park grounds.

According to Parks Management, the provision of public parks lags behind the development of housing projects, infrastructure, and other public facilities. (Personal communication, Don Akiyama, City & County Department of Parks and Recreation, `Ewa Beach Complex Supervisor, August 1994).

Planned Facilities and Services. The City and County is planning to establish a district park either by expanding `Ewa Mahiko Park or creating one at Oahu Sugar Company's warehouse area in `Ewa Villages. (Personal communication, Ronald Wong, City and County Parks and Recreation District Manager, August 1994.) The proposal is part of the `Ewa Villages revitalization project. The Master Plan for `Ewa Villages also includes a municipal golf course (currently under construction).

Dedicated parks to be developed at some future time are: Asing Community Park, Iroquois Point Neighborhood Park, Geiger Community Park, Kapolei Community Park, and Makakilo Heights Neighborhood Park (personal communication, Jason Yuen, City and County Parks and Recreation Facilities Development Division, Parks Planner, October 1994). Geiger and Kapolei Community Parks have priority for development.

Barbers Point NAS includes extensive recreation areas, most of which the Navy plans to retain after the base closes. An agreement was recently reached between the Navy and the Department of Parks and Recreation outlining possible joint use of the shoreline at Barbers Point to accommodate both Navy and civilian needs. Under the agreement, the City would acquire and develop 38 acres of shoreline for beach park facilities and 15 acres to the east for shoreline fishing. The Navy would retain a total of 42 acres of beachfront at Nimiiz beach and White Plains Beach.

The City and County Parks Department and members of the community have been interested in creating a regional park at Barbers Point NAS. Preliminary planning indicates that land will be available for such a use. However, no definite

land allocation will be made until after a Master Plan and Environmental Impact Statement for the base closure are completed. The final allocation will be made by the Secretary of the Navy, after considering recommendations from the island-based Reuse Committee.

Impact of Project. According to the `Ewa Parks and Recreations Manager, the impact of the project on the existing parks and recreational facilities will be contingent on the coordination of new parks and home construction. If the construction of parks lags behind housing development, then the increased demand for park space will severely impact existing facilities.

4.4 EDUCATION AND LIBRARY SERVICES

4.4.1 Primary and Secondary Schools

Existing Conditions. According to the DOE, the rapid development in the `Ewa area has created a pressing need for additional schools and classroom space. Currently, Campbell High School is the only high school serving the area. (Personal communication, Ed Hasegawa, DOE Leeward District Business Office, Administrator, and Lester Chuck, DOE CIP Planner, August 1994.) The DOE has stated that Campbell High School is sufficient for the existing population until the turn of the century. However, many in the `Ewa community disagree with this timeframe, and have requested that the DOE plan for Kapolei High School to open sooner. The one intermediate school serving the area is `Ilima Intermediate, located in `Ewa Beach.

Kapolei Elementary opened recently and is now serving the Kapolei Villages, Makakilo, and Makaiwa Hills area. For the 1994 year, the elementary school had an enrollment of 350 students. However, once the school is completed by Fall of 1995, the DOE is projecting that between 800 and 850 students will be enrolled. (Personal Communication, Ed Hasegawa and Kapolei Elementary School, August 1994.)

`Ewa has a total of five elementary schools, each of which has a maximum capacity of 1,000 students: `Ewa, Mauka Lani, `Ewa Beach, Makakilo, and (as of 1995) Kapolei Elementary Schools. `Ewa Elementary is nearest to the project site.

Planned Facilities. Kapolei High School will serve 1,500 to 1,800 students from the Kapolei Villages, Makakilo, Makaiwa Hills, and Ko Olina Estates development areas by the 1998-1999 school year. Current plans call for it to be located next to the UHWO site, across the North-South road from Phase 1 of the project.

The DOE also plans to build elementary schools at 'Ewa by Gentry and Ko Olina. An intermediate school is to be built in 1998-1999, to serve approximately 900 students. Also in the Leeward District, new elementary schools are planned for Waikele and Royal Kunia. Waikele and Royal Kunia Elementary students will feed into Waipahu Intermediate and Waipahu High School.

Impact of Project. As the East Kapolei project builds out, many children will need school facilities nearby. The project includes elementary school sites in each phase to accommodate some of that need.

The DOE has estimated that, at buildout, the project would house the following students (letter, Dr. Herman M. Aizawa, Superintendent, November 4, 1994):

DOE PROJECTION OF ENROLLMENT — 10,000 HOUSING UNITS IN PROJECT

	Total	Ratio per 100 Units
Elementary (Grades K to 6)	1,772	17.72
Intermediate (Grades 7 to 8)	500	5.00
High (Grades 9 to 12)	710	7.10

When the ratios shown above are used with the project construction schedule, estimated enrollments for the project can be derived (as shown in Exhibit 4-A). It indicates that project enrollments could well justify construction of an elementary school before the year 2000, and a second school in 2005 or soon afterwards. Project residents would significantly contribute to intermediate and high school populations.

**Exhibit 4-A
ESTIMATE OF PROJECT'S DOE ENROLLMENTS**

	1997	2000	2005	2010	Buildout
UNITS BUILT (1)	400	2,650	5,500	9,250	10,000
DOE STUDENTS (2)					
Elementary (K to 6)	71	470	975	1,639	1,772
Intermediate (7 to 8)	20	133	275	463	500
High (9 to 12)	28	188	391	657	710
TOTAL	119	790	1,640	2,758	2,982

NOTES: (1) From Exhibit 3-A.

(2) Based on the following number of students per 100 households, from the DOE, 1994:

Elementary	17.72
Intermediate	5.00
High	7.10
TOTAL	29.82

Exhibit 4-A follows DOE calculations. It is not an independent calculation of school impacts, in that it estimates enrollments, not impacts. To the extent that students living in the project are already in the DOE, and perhaps in the DOE schools serving project residents, impacts are minimized. This factor is important for intermediate and high schools, rather than elementary schools, since elementary students in the project are likely to attend new schools within the bounds of the project.

If no new school construction occurred, enrollments at schools near the project would soar far above capacity. The preliminary concept plan already shows two elementary school sites.

The DOE is requesting that the developer contribute two elementary school sites next to County parks and an intermediate school site within the East Kapolei project. In addition, the DOE indicates that it will request a contribution toward the construction of high school facilities.

The developer has entered into discussions with the DOE concerning possible contributions to offset the impact on the DOE of project development.

4.4.2 Post-Secondary Education

Existing. The nearest post-secondary school is University of Hawaii West Oahu, located in temporary quarters on the campus of Leeward Community College in Pearl City. UHWO also offers limited courses at their Wai'anae Coast campus. Various universities and colleges offer courses towards degree-granting programs at the Schofield Barracks complex in Wahiawa. The University of Hawaii at Manoa campus is a 45-minute to one-hour drive from the project, depending upon traffic.

Planned. The University of Hawaii Board of Regents selected a site near Kapolei for the proposed 500-acre University of Hawaii, West Oahu (UHWO). The Legislature has yet to approve construction funding for the campus.

Impact of Project. The project will contribute to development and operation of UHWO, notably by:

- **Participation in Regional Infrastructure Development.** This will help to speed infrastructure development and lower the cost to be borne by other landowners, including the State; and
- **Providing Convenient Housing.** The project will likely house many students, faculty, and staff of UHWO.

4.4.3 Library Services

Existing. Currently, 'Ewa Beach School and Public Library serves 'Ewa ('Ewa Beach, Village Park, West Loch, and Barbers Point), Makakilo, and Kapolei populations, as well as Campbell High School students. The total population served is close to 40,000. The combination school and public library is a full-service library, situated on Campbell High School grounds, with separate entrances for high school students and public patrons. There are two sets of staff to provide high school and public library services, although services often overlap. The public library staff consists of two full-time librarians, two library technicians, two circulation clerks, student volunteers, and a janitor. The current 1994 State hiring freeze has prevented hiring for two vacant positions. The Campbell High School library staff is under DOE jurisdiction and is comprised of two librarians, two library technicians, and one assistant. The library has a collection of 86,883 books, heavily concentrated in the children/youth and reference collections.

Planned for the Near Future. Plans include expansion of existing libraries and a major new library:

- **Expansion in the Secondary Study Area.** Plans to expand the Waipahu Library are in the design approval stage. Expansion is to be completed by fiscal year 1995-1996. The expanded library will occupy 15,500 square feet of land in Waipahu, and feature modern library services, including a drive-through book drop-off service. On the Wai'anae Coast, the Nanakuli Library is in its final stages for approval, and will enter design stage this year.
- **Kapolei.** The State plans to use part of 40 acres donated by Campbell Estate for the Kapolei Library. This will satisfy future regional demand. The Kapolei Library is projected to occupy at least 100,000 square feet. The facility will house a collection of approximately 400,000 to 500,000 books and other media, serving as the "second anchor" to Honolulu's Downtown library (Personal communication, Clyde Okinaga, Administrative Services Officer for the Hawaii State Library System, August 1994).

Planned for the Long Term. Library System staff feel that the 'Ewa community's need for services can be met by the existing library, the proposed Kapolei Library, and those in neighboring districts. The long-term plan for the 'Ewa Beach School and Public Library is to separate it into two facilities. The Library System intends to eventually separate all of the school-public libraries in the state.

Impact of Project. The plans to expand Waipahu Library, to build Kapolei Library, and to separate the `Ewa School and Public Library into two facilities are expected to absorb any additional demand from the proposed residential development.

Section 5 FIT OF PROJECT WITH SURROUNDING COMMUNITIES

This section discusses the "fit" between the proposed Schuler project with its neighbors. It draws extensively on the views of key informants knowledgeable about the concerns of people in `Ewa. In Section 6, we go on to provide an independent consultant's assessment of impacts on social life.

Community members offered several suggestions for improving the project or benefiting the community. We mention some of these in this section and discuss mitigations of project impacts in Section 7.

5.1 APPROACH

5.1.1 "Fit" or Compatibility

How well the project fits into or is compatible with existing communities nearby is not fully predictable or guaranteed. Objective and subjective factors combine to make a project fit with its surroundings. Judgments about whether the project is in harmony with community character are based on people's personal viewpoints, their definition of community character, and own concept of what makes a project compatible. Also, residents' concerns change over time and new ones will likely emerge.

The context for this discussion is of a region in flux, where development and population changes are happening at a quick pace. Presently, `Ewa sits in a backwash of development; its residents, old and new, are adjusting to the fast-paced growth of residential communities that has continued since the mid-1980s, when the first phases of West Loch Estates and `Ewa by Gentry were built. Many `Ewa residents sought to advise Schuler Homes to learn well from the mistakes of other residential developments. The impact of growth on the quality of life has been a major issue of discussion for the `Ewa Neighborhood Board.

5.1.2 Sources

Community interviews provided the major source for learning about community character in the study area. During September 1994, Community Resources, Inc. (CRI) staff conducted interviews of community leaders, organizational representatives, and private citizens who were likely to know about issues and concerns of importance to various groups in `Ewa. The interview process focused on residents of the `Ewa Plain area, but also included the

perspectives of some members of neighboring communities, namely Makakilo and Kapolei. (See Appendix B for a list of interviewees.)

Interviewees were given a handout with project description and map (Appendix C). The interviews provided an occasion for people to discuss their concerns, opinions about regional growth, perceptions of potential impacts associated with the project, and possible mitigations. Appendix C-1 displays a list of major concerns and issues that surfaced during the interviews.

5.2 COMPATIBILITY

During the community interviews, several factors emerged which have bearing on residents' assessments of the project's compatibility with surrounding areas and activities.

Informants tended to evaluate the project first in terms of the likelihood that it will add to or alleviate `Ewa's current traffic problem and lack of community facilities. Many viewed the project both in relation to other communities and as part of a regional community.

In interviews, `Ewa residents often had ideas about specific ways Schuler Homes could, in their view, improve the project and contribute to `Ewa. (In CRI's experience, `Ewa residents are more apt than residents of other areas in Hawai'i to suggest physical improvements and contributions. This tendency probably reflects their recent experience with a variety of developments.)

Exhibit 5-A on the next page lists the factors used by interviewees to judge how the East Kapolei project would fit in with its surroundings. It indicates both judgments of the anticipated effect of the project and the (somewhat different) ways that people thought the developer could contribute to `Ewa, tending to make the project an integral part of the evolving region.

5.2.1 Views of Community Character

Residents recognize that `Ewa is in transformation. Some look forward to the urbanization, while others rue its coming. Many long-time residents wistfully anticipate the dissolution of the small town intimacy and rural lifestyle that once characterized `Ewa. On the other hand, there are residents who herald the coming of the Second City and eagerly look forward to enjoying the amenities that metropolitan life brings.

Exhibit 5-A
FACTORS IN COMMUNITY'S ASSESSMENT OF PROJECT "FIT"

FACTOR	IMPORTANCE FOR "FIT"	
	Saliency in People's Expectations of Project	Likely Eventual Importance
Traffic and Roadways	1	2
Regional Need for Community Facilities	2	3
Development of a Mixed-Income, Mixed-Aged `Ewa Community	3	1
Impact on Character of Older Communities	4	4
Desire for Open Space and/or Parks	5	5
Support of University Development	6	6
Regional (im)balance of Jobs and Housing	7	7

NOTES: In judging "saliency," CRI combines informants' ideas of (a) what is important and (b) what matters to many in the community with (c) whether factors were mentioned in many interviews or only a few. Lower numbers are used for the more important factors; higher numbers indicate that an issue was less important and/or less widely mentioned.

There is some disagreement, as to how the transformation into a second city will actually take shape — as to what is the character of the emerging `Ewa. Some residents characterize `Ewa as a patchwork of suburbs, with growing contrasts between older and newer communities. They see the Plain as being blanketed by large, self-contained communities. Yet others look toward the promise of urban life, and the development of industry and commerce, with educational and recreational activities in that region.

Several interviewees noted perceptions of division between existing communities. For example, some interviewees mentioned that Makakilo was distinctive from other `Ewa communities and went on to distinguish between "lower" and "upper" Makakilo neighborhoods. In the `Ewa Plain, the `Ewa Beach community tends to see itself as different from the other Plain communities. Part of this perception may be attributed to the ongoing debate within the Beach community over HASEKO'S `Ewa Marina development. Some `Ewa Beach people also regard `Ewa by Gentry with resentment.

In contrast, a number of interviewees from `Ewa expressed their consternation over the tendency for people from outside communities to confuse `Ewa with `Ewa Beach. They also felt that `Ewa has often been overlooked in terms of resource inputs, while power brokers have concentrated their investments in Kapolei and Makakilo.

5.2.2 Factors Shaping Community Views of Project Compatibility

Traffic and Roadways. Residents expressed grave concern about any addition to the region's traffic congestion, and applauded the project for helping to develop the North-South Road. Some wanted assurance that the North-South Road would have its own connection to H-1, and would not add to traffic on Farrington Highway.

Comment: At first, the project will be reached through a road from Farrington Highway. The North-South Road will in time be the major point of entry to the project. That road will have a H-1 interchange and a connection to Farrington Highway. Hence it will tend to lower the traffic volume on Farrington Highway and Fort Weaver Road by providing a new road into and out of the region, not by barring project traffic from Farrington Highway.

Regional Need for Community Facilities. Community informants emphasized recreation and religious facilities:

- **Park Space and Recreational Facilities.** With development comes the reduction in green space and open vistas. Residents feel particularly affected by the lack of park space and recreational facilities. This is a major issue for all 'Ewa residents. Developers of new communities have been criticized for not providing parks with adequate facilities in a timely manner, and the City Parks Department has been criticized for not maintaining the parks satisfactorily.

Although the East Kapolei proposal allocates space for two neighborhood parks, some of the interviewees wondered whether that would be enough park land. Based on recent experience with other residential communities, others expressed cynicism over the developer's ability to furnish park facilities. A few interviewees thought that the most appropriate use for the subject property is to remain as agricultural land for green space. Yet another few thought that the site is a prime location for a regional park.

Comment: A regional park is a priority consideration for the Barbers Point Re-use Master Plan. Also, a district park is planned as part of the 'Ewa Villages revitalization project. Kapolei Regional Park was developed on 28 acres of land that was once Fort Barrette. Campbell Estate donated an additional 44 acres for the park, which is soon to open.

- **Space for Churches.** Several interviewees remarked that the planned developments in 'Ewa do not provide space on which religious

organizations can establish their churches, or too little space such as a community multi-purpose room that must be shared with other church groups. Interviewees pointed out the importance of having places to worship in the local community, and that quite often, churches serve as a safety net for the needy.

Comment: The Kapolei Long Range Area Master Plan provides for about six acres on which churches may locate. In addition, there are churches of different religions and denominations in the `Ewa Plain and Makakilo communities.

Development of a Mixed-Income, Mixed-Age `Ewa Community. Some interviewees thought that the East Kapolei project should assure a mix of housing types for people of different socio-economic levels. In their view, the development would be most compatible if it avoided being on either side of the continuum of housing: neither exclusively or primarily for the affluent large-lot "estate" homes nor for low-income people (low-income rentals). People warned against promoting a sense of exclusiveness, as in a gated community.

Comment: Of its total housing stock, Schuler Homes plans to build 30% as "affordable," multi-family units. The entire project will be designed for a middle-income homeowner market. No gated areas are planned.

Impact on Character of Older Communities. Some interviewees feel that `Ewa has become a disjointed array of walled-off residential communities, and lacks a focal point for pulling the communities together. The interviewees expressed hope that Schuler Homes will give thoughtful consideration to the design and configuration of the housing units. They thought that the homes should be appropriately designed for the leeward climate, as well as reflect a country feeling, perhaps basing the design on plantation style architecture. West Loch Estates was often cited as being well-designed, while `Ewa by Gentry was often criticized for its design and construction.

In addition, interviewees would like for Schuler to try to tie its development in with neighboring communities, by providing accessways like bike paths or common green space as buffer areas.

Interviewees felt that an influx of "outsiders" coming to settle in the East Kapolei project would likely change the character and lifestyle of the existing communities, particularly the older ones like `Ewa Villages and `Ewa Beach. A few wondered if the development would contribute to widening gaps between the old and new communities, and between "haves" and "have nots." On the other hand, one interviewee was happy to have more people coming to `Ewa, reasoning that the more residents there are, the more opportunities for friendship, participation in community organizations, and regional activities.

Comment: The project is expected to be highly competitive with `Ewa by Gentry and the Villages of Kapolei (Atwater, 1994). Buyers will likely resemble a cross-section of the residents of these projects.

Support of University Development. Several interviewees thought that the East Kapolei project would be compatible with the future University of Hawai'i West O`ahu (UHWO) proposed for an adjacent site, and be mutually advantageous as well.

Comment: Schuler Homes hopes to plan for the infrastructure needs of the region in cooperation with State and university representatives.

Regional (Im)balance of Jobs and Housing. Some interviewees thought that the location of the proposed project will help add to Kapolei's customer base, and be generally beneficial to local businesses in `Ewa. However, a number of other interviewees cautioned that Schuler could end up as another bedroom community if Kapolei falls short of becoming a major employment center for the region. Residents felt that the timing of the development of the homes with the University and Kapolei is a significant factor to be considered.

Comment: The East Kapolei project will support operational jobs in its neighborhood commercial area. Residents will likely shop at Kapolei commercial areas as well.

5.3 DEVELOPMENT OF "FIT"

Any large new project stands out simply by being new. Over time, it becomes a recognized, if not necessarily loved, part of its region. The Schuler project will affect the region in different ways over time. The importance of different compatibility issues will also change. CRI finds the following sequence likely:

- **Planning Phase.** The project stands out as a major addition to the `Ewa residential stock. With the new project, opportunities arise for sub-regional planning to deal with traffic and infrastructure.
- **Early Construction Period.** Cane land in Phase 1 will be cleared and site improvements begun. The project will start out small and be buffered from other areas by Phase 2 land, which will still be in agriculture, and by the golf course next to the `Ewa Villages. However, traffic on Farrington Highway will be heavier because of construction work on the project and at the adjacent UH West O`ahu site.

- **Midpoint of Development (Completion of Phase 1 of Project).** With 5,000 units in Phase 1, the project is larger and will feed into the North-South Road. Some Phase 2 land will be cleared, and construction of Phase 2 will begin. Traffic may increase at intersections along the North-South Road and Farrington Highway, and at the North-South Road and H-1 Freeway interchange.

Students will go to schools on site for the elementary and intermediate grades, and then to regional intermediate and high schools. By this time, UH West O`ahu should have opened, and the project will serve its faculty and students. Westbound traffic to Kapolei should increase as the Civic Center, shopping, and recreational areas are nearly completed.

- **Buildout.** All 10,000 units are completed. The region will be fully urbanized. The project may attract young families and people involved in education, with new schools on or near the project site and UHWO nearby. The North-South Road will be a major roadway carrying much of `Ewa's local traffic flow. Schuler project residents will tend to be relatively isolated from the other `Ewa Plain communities, and more likely orient their activities and business towards Kapolei than makai communities.

Section 6 SOCIAL IMPACTS

6.1 OVERVIEW

This section describes potential impacts on lifestyle, family life, and community organization. It is an independent consultant's assessment, based on research conducted for this study, interviews with `Ewa residents and business leaders, and CRI's experience of communities and projects throughout Hawaii.

Social impacts are rarely automatic results of development. They are shaped by planning and design decisions, by interactions with the surrounding community, and by outside forces and events. The assessment of social impacts hence deals with tendencies, dangers, and opportunities, not inevitable consequences. Potential unwanted impacts and problems of compatibility can often be reduced or avoided. Section 7 discusses measures for mitigating potential adverse impacts.

Social Impacts. Major social impacts of the project are summarized as:

- Provision of needed housing for O`ahu;
- Increase in traffic and, until new roadways are built, congestion;
- Enhancement of Kapolei's customer base;
- Construction noise or dust;
- Competition for community resources and facilities, namely parks and schools; and
- Perpetuation of a growing sense of isolation between large-scale residential developments and older communities, and the transformation of `Ewa into a bedroom community.

Exhibit 6-A on the following pages provides a summary of potential impacts, which are discussed in more detail later in this section.

**Exhibit 6-A
POTENTIAL SOCIAL IMPACTS OF PROJECT**

Area Potentially Affected	Planning 1995	Early Construction 1996 - 2000	Mid-Development Mid-2000s	Build-Out 2015
'EWA REGION			Loss of historical identity in 'Ewa _____	
			Intensified need for regional park development _____	
			Intensified need for community facilities _____	
			Intensified need for early childhood education and care _____	
PRIMARY STUDY AREA PROJECT SITE		Provision of Needed Housing for O'ahu _____		
		Irritants/health hazards from noise and dust _____		
		Incomplete infrastructure affecting residents' quality of life		
		Lack of community amenities affecting residents' community life		
		Increased traffic on site from construction and new residents	If North-South Road is not completed, then aggravated traffic from housing, UH-WO, Kapolei High School. _____	
	Opportunity to plan for regional infrastructure needs	Orderly regional development _____		
NEARBY Ewa Villages		Irritants/health hazards from noise and dust _____		
		Increased traffic along Fort Weaver Road	Lack of architectural compatibility with historic preservation area _____	
		Schools over capacity ('Ilima, 'Ewa - if construction of school at project lags)	Regional project build-up lessens sense of historic place and identity in 'Ewa	
			Increased competition for public facilities _____	

Exhibit 6-A (continued)

Area Potentially Affected	Planning 1995	Early Construction 1996 - 2000	Mid-Development Mid-2000s	Build-Out 2015
Other Communities Along Fort Weaver Road	Reinforced perceptions of separation and "us vs. them"	Schools over capacity would affect West Loch	Increased competition for public facilities	
Makakilo and Kapolei		Increased local traffic on Fort Weaver Road and Farrington Highway	Traffic conditions to improve with North-South alternative road.	
		Enhance Kapolei customer base		
		Increased traffic along Farrington Highway and H-1, eastbound	Increased traffic on H-1, Farrington Hwy. to Kapolei Civic Center	
PLANNED University of Hawai'i - West O'ahu (UHWO)	Opportunity to coordinate infrastructure development, enhancing efficiency in development and preventing potential conflicts	Increased traffic along Farrington Highway and North-South Road		
			Convenient for university staff and faculty	
Kapolei High School	Increase demand for high school construction	Increased traffic along H-1 eastbound, Farrington Highway, North-South Road	Threats to students' pedestrian safety if no safe accessways from Phase I and II provided	
SECONDARY STUDY AREA				
Waianae		Increased traffic on H-1 and Farrington Highway		
Central O'ahu		Less competition for Central O'ahu housing market		

Community Issues and Concerns. Most of the potential social impacts cited by 'Ewa residents during community interviews were inextricably tied to regional concerns over the adequacy of infrastructure and public facilities. People's experience of regional change has repercussions for the East Kapolei Project. Residents seemed to have lumped together perceptions of the East Kapolei project with the other residential developments. Consequently, impacts of the project were invariably voiced in terms of potential cumulative impacts on the region.

Based on the types of issues and concerns raised by the interviewees, some broad themes emerge around which the potential impacts can be grouped:

- **Quality of Life** — primarily infrastructure and other engineering issues which affect the quality of people's lives in a community.
- **Community Character** — elements of design, configuration, timing and coordination of the development, and community consultation processes which affect the project's compatibility with surrounding communities and land uses, and resident perceptions of whether that project is an asset to the region.
- **Community Involvement** — an expressed need for informational and cooperative problem-solving interactions between developer and community representatives, that seek pro-active mitigations of anticipated project impacts.
- **Health and Safety** — mainly issues related to protracted construction, cumulative effects of construction in the region, but also concerns that the developer give thoughtful consideration to providing safe accessways for pedestrians.

Distinctive concerns of particular communities are identified later in this section.

6.2 REGIONAL IMPACTS

The proposed development is the largest residential community in the region. Consequently, it may result in substantial impacts to the region. The impacts are discussed in relation to the phases of project development. (See Exhibit 6-A.)

- **Planning** — Opportunities exist to plan for regional infrastructure needs. The outcome could be faster and more orderly regional development, especially since Schuler and the UH will have overlapping construction schedules.
- **Mid-development and afterwards** — Housing construction should be well on its way by the mid-2000s. At this point, Phase 1 should be completed and Phase 2 started. Potential impacts related to this phase of development include:
 - The increased residential population will intensify the need for regional parks and community amenities.

- Loss of historical identity in `Ewa — Much of the former cane land in the landbanked area will have been transformed into housing. Much of the Plain area will have become urbanized, and existing pockets of plantation life may be dwarfed by the new developments.
- Increased population will intensify the need for early childhood education and care in the region. (Situated in Kapolei, Seagull Schools will be the major child care and education facility in the region.)

Potential increased demand for infrastructure, facilities, and services can mean greater competition for limited resources in the short term. In the long term, the greater the regional population, the more justification will exist for expensive projects such as the North-South road or for locating social service providers in the proposed Kapolei Civic Center.

6.3 IMPACTS ON NEARBY AREAS AND LAND USES

6.3.1 Project Site

The project will take 15 or more years to build. Residents will move in as housing construction continues until buildout.

Impacts:

- **Quality of Life.** The project will provide new housing for thousands of O`ahu residents. For many, this will be a first chance of home ownership. After years of interviews with Hawaii social service professionals, CRI finds that the provision of housing (and hence less crowding in existing neighborhoods) is strongly associated with lower stress and family problems. However, new homeowners typically pay a large share of their income to cover housing costs: homeownership does not relieve people of economic and social challenges so much as increase the benefits of meeting these challenges.

Facilities that support social interaction and activities — social halls, churches, and parks — contribute to the vitality of neighborhood and community life. Limited availability of such spaces can minimize residents' involvement in community life.

- **Health and Safety.** Construction noise and dust are potential irritants or health hazards to project residents. Sites nearby completed homes

will be under construction and barriers such as shrubbery or landscaping may either be freshly or incompletely planted. In extreme cases, chronic exposure to construction conditions can have cumulative impacts to their health.

6.3.2 Communities along Fort Weaver Road

Fort Weaver Road links several communities: West Loch Estates, West Loch Fairways, Ewa Villages, `Ewa by Gentry, and `Ewa Beach.

`Ewa Villages. The `Ewa Villages lies southeast of the East Kapolei project site, and is the nearest neighbor to the project.

Residents' Issues and Concerns. Infrastructure issues — drainage and traffic above all — were mentioned by all informants. Some interviewees felt that the project would attract residents of a different socio-economic status, which would affect relations between new residents and long-time residents. Social tensions might be played out in common areas such as neighborhood parks.

Others felt that the development would widen the gap between rich and poor, thereby raising `Ewa's crime rate. It was thought that new residential developments present convenient targets for burglary.

One village resident was concerned that her property taxes would rise as a result of being near a new residential development.

Impacts:

- **Health and Safety.** Impacts from construction dust will likely be few and short-term. The `Ewa Villages golf course and, after a few years, much of Phase 1 of the project will separate the Villages from new construction sites.

Potential project impacts on drainage — and hence on the flooding that occurs in `Ewa Villages apart from the project — are being addressed by project engineers, as reported elsewhere in the EIS for the East Kapolei project.

- **Community Character.** The large scale of the proposed East Kapolei Project could overwhelm the historic atmosphere of the rehabilitated `Ewa Villages. The addition of these units to the region may lessen residents' sense of historic place and identity in `Ewa. This incongruity may become magnified because `Ewa Villages will be situated between

two large-scale housing developments, East Kapolei and `Ewa by Gentry.

- **Quality of Life.** Construction of school facilities can take a number of years, depending on various factors, including the availability of State funds. `Ewa Elementary School would likely be over capacity if the elementary school for the Phase I development is not completed when residents move in. The school currently serves children living in the `Ewa Villages and the West Loch projects. The elementary school district will be re-districted in 1996 when Gentry Elementary comes on-line (DOE, 1994). `Ilima Intermediate could similarly face problems of capacity.
- **Economic Impact on Residents.** The East Kapolei project will have no impact on `Ewa Villages residential tax assessments. Tax assessors routinely treat new projects as separate "neighborhoods," and only treat adjoining areas as comparable if home sales indicate that people are willing to spend much the same amount for older and new homes.

The Other Communities along Fort Weaver Road.

Residents' Issues and Concerns. Residents from the West Loch, Gentry, and `Ewa Beach communities were concerned that the East Kapolei project might exacerbate existing regional conditions. They were most apprehensive about the development adding to what they feel are already intolerable traffic conditions along Fort Weaver.

Businesses along the road felt generally optimistic that the East Kapolei development would bring more customers.

Impacts:

- **Quality of Life.** West Loch students would also be affected, if `Ewa Elementary exceeds capacity because the elementary school in the Phase 1 development is not completed when residents move in. Again, `Ilima Intermediate could face problems of capacity, as well.

During the early construction phase, local traffic will likely increase along Fort Weaver Road and Farrington Highway, until the reliever North-South Road is completed.

6.3.3 Makakilo and Kapolei

Residents' Issues and Concerns. Residents of Makakilo and Kapolei felt that their communities would be most impacted by increased freeway traffic from the project.

Impacts: The project will add to the customer base for Kapolei commercial areas. Project residents will add to regional highway traffic.

6.4 IMPACTS TO PLANNED LAND USES

6.4.1 University of Hawai'i - West O'ahu (UHWO)

A number of opportunities that could yield mutual benefits exist for Schuler Homes and the University of Hawai'i.

Residents' Issues and Concerns. Community interviewees recognized that the project could help to speed development of the North-South road, UHWO, and Kapolei High School.

Impacts:

- **Quality of Life.** Coordinated planning will speed development and can lower overall costs for UHWO construction. When UHWO is open, the project will provide housing and neighborhood commercial areas serving students, faculty, and staff.
- **Health and Safety.** By the time UHWO opens, project construction along the east side of the North-South road will likely be finished. Hence the project and the road will buffer UHWO from construction impacts.

6.4.2 Kapolei High School

The high school is supposed to be built before the year 2000. It will serve 1,500 to 1,800 students from Kapolei, Makakilo, Makaiwa Hills, and Ko 'Olina Estates.

Residents' Issues and Concerns: Many residents have long-awaited a second high school for 'Ewa.

Impacts:

- **Quality of Life.** The project will increase demand for high school construction.
- **Health and Safety.** The high school site is south and west of the project, and separated from it by both the North-South road and the new DHHL land. Hence few or no construction impacts are likely.

Students living in the project could be at risk along the North-South road unless footpaths and pedestrian overpasses are provided between the project site and the high school. (This impact is cumulative, and more a consequence of road design than of the project.)

6.4.3 Site Transferred to DHHL

The 85-acre site recently transferred to DHHL is not yet a planned land use. However, it presumably will be used for housing. It will be far more easily developed with the project than without it. The savings on infrastructure planning noted earlier will likely benefit DHHL as well as others. Furthermore, DHHL can consider using the project's road to Farrington Highway as well as the North-South road for traffic to and from their site, if speedy development of the acreage is desired.

6.5 IMPACTS ON SECONDARY STUDY AREA

6.5.1 Wai`anae DPA

Most Wai`anae residents commute to Honolulu or to other areas of the island for work. Farrington Highway and H-1 Freeway are the only thoroughfares out of the region. The project will affect residents by adding traffic to the freeway.

6.5.2 Central O`ahu DPA

The project will compete with Central O`ahu housing developments as well as with `Ewa subdivisions for the resident housing market. As a result, it will tend to slow the buildout of those developments, and hence tend to slow the pace of growth in Central O`ahu.

Section 7 MITIGATION MEASURES AND COMMUNITY BENEFITS

In a region where several developers have been active, community representatives may expect community benefits as their due. Here a distinction is made between mitigation measures, which alleviate actual impacts of a project, and community benefits, which do not respond to specific project impacts but may have an indirect effect of improving relations with the surrounding community.

In this section, CRI identifies ways to mitigate adverse project impacts. This is an independent consultant's assessment, implying no commitment on the part of Schuler Homes, Inc. to undertake any of the steps mentioned. We further note possible community benefits, without implying in any way that provision of these benefits is necessary or obligatory.

To the extent that impacts affect people's sense of their lifestyles and community, mitigation of those impacts depends on their view of proposed solutions as appropriate. Community involvement in decision-making can be crucial to implementing mitigation measures that effectively respond to residents' needs and concerns. Accordingly, consultant recommendations are suggestions for further review by the project developer and community leaders, not prescriptions.

7.1 MITIGATION MEASURES

The project contributes to meeting the islandwide need for housing. It fits in with government policy encouraging growth in `Ewa. As a result, it contributes to the regional problem of coordinating development so that infrastructure, housing, and services are all provided efficiently. It can also contribute to the solution.

Potential adverse impacts of the project fall under three general headings, as shown in Exhibit 7-A on the next page.

- **Quality of Life.** Potential adverse impacts are inadequate regional physical and social infrastructure; limited community facilities on site for residents, and irritation due to traffic congestion.

The problems of limited regional infrastructure and facilities (discussed in Section 6) can be addressed through:

- *Coordinated planning among regional landowners for infrastructure development.* Schuler Homes, Inc. is already attempting such planning.

**Exhibit 7-A
POSSIBLE MITIGATION MEASURES**

POTENTIAL IMPACTS	MITIGATION MEASURES
<p>QUALITY OF LIFE</p> <p>Regional: inadequate physical and social infrastructure for growing community</p> <p>On site: lack of child care; limited community space</p> <p>Irritation due to traffic congestion</p>	<ul style="list-style-type: none"> ▪ Develop infrastructure for project in coordination with other regional developers ▪ Work with community groups and landowners to plan for regional facilities ▪ Provide incentives to agencies to develop needed facilities on time ▪ Provide community facilities or support community associations' use of park space ▪ Allow family child care homes in CC+Rs ▪ Work for speedy development of North- South Road and other highway improvements
<p>HEALTH & SAFETY</p> <p>Construction dust, noise</p> <p>Students on North-South road</p>	<ul style="list-style-type: none"> ▪ Follow City and State regulations governing construction ▪ Plan construction timing to limit duration of impact on adjoining areas ▪ Anticipate, respond to resident complaints ▪ Work with government planners
<p>COMMUNITY CHARACTER</p> <p>Loss of "country" character</p>	<ul style="list-style-type: none"> ▪ Design sensitive to 'Ewa Villages (in nearby sections of Phase 1)

- *Continuing work with community associations, landowners and interest groups to plan for regional facilities. Beyond infrastructure planning, 'Ewa landowners and communities may seek to cooperate in identifying needed services in government centers to be developed in Kapolei. Again, cooperation will be needed to insure that regional park plans — in existing developments and at*

Barbers Point NAS — respond to local needs and are developed as soon as needed.

- *Incentives to spur public agencies to develop facilities when needed.* While government policy supports new development in `Ewa, budgets are tight. Agencies and legislators may understandably delay construction of needed facilities in `Ewa. Campbell Estate's practice of making land donation contingent upon timely development of the land (as at the UHWO site) provides an example of how to offer an incentive to government to give priority to `Ewa's needs.
- The East Kapolei project consists at the moment of little more than a conceptual plan. As a result, provision of community facilities on site is only indicated by the allocation of park space. Two potential adverse impacts are visible:
 - *Community facilities and spaces.* Project plans include parks and schools as sites for neighborhood and community life, but no other community facility spaces have as yet been identified. While community halls may often not be well used, it is doubtful that open space in two parks will suffice to support an active and varied community life. Potential mitigations include (a) providing space for additional community or neighborhood social facilities and (b) supporting community groups to organize and use available park or school space.
 - *Child care needs.* While Kapolei will have a large child care center, project residents are likely to need additional services. In Hawaii, most working parents prefer to find child care in family home settings — with relatives, friends, or other providers — for children younger than three years old. Because of the distance between `Ewa and older urban areas, many families may find it impossible or impractical to take young children to relatives on a daily basis, and may need child care facilities nearby. Their needs can be met by skilled private providers in the project area so long as (a) the project CC+Rs allow family care homes and (b) child care providers and support services such as Traveling Preschools are allowed to use community parks.

In the near term, project contributions to regional traffic congestion will affect the quality of life of residents depending on Farrington Highway and the Fort Weaver Road interchange. The most effective mitigation strategy would be to work to encourage government agencies to

develop additional roadways — North-South road and its interchange with H-1, above all — as quickly as possible.

- **Health and Safety.** Two separate potential impacts are of concern:
 - *Construction impacts* are recognized irritants on the dry `Ewa Plain. The project can work to minimize construction dust and noise by (a) following government regulations and (b) planning the timing of construction so that adjoining properties are affected by project construction only for a limited period of time. Construction of Phase 1 blocks adjoining `Ewa Villages can be planned to limit the length of time than construction occurs near any particular village. Similarly, construction of blocks across the North-South road from the University site can be timed to occur before the University opens, minimizing potential impact on UHWO.

In addition, the developer may consider establishing a hotline for complaints about construction impacts and delegating employees to respond to these. While this action is a form of community response, it also can help in monitoring the performance of construction crews, insuring that they meet standards needed to minimize construction impacts.
 - *Safety of children along the North-South road* is the responsibility of highway planners more than of the developer. The developer can work with government planners to see that pedestrian overpasses and walkways are provided, and children and traffic on this major regional road do not mix.
- **Community Character.** `Ewa is being urbanized, and the project cannot be held accountable for that fact. However, the project is situated next to `Ewa Villages, where an attempt is being made to preserve a plantation community and a "country" ambiance through restoration and design of new homes. In order to support this effort, some attention may be necessary to coordinate design of Phase 1 areas near `Ewa Villages with the Villages.

7.2 COMMUNITY OUTREACH AND BENEFITS

Community involvement is advisable to increase the fit of the project with surrounding areas, to encourage regional cooperation in planning, and to identify effective mitigations for local-level impacts. Such involvement, by the developer and by resident community groups, can further help to counter the regional trend

toward a split between old and new communities. The developer has begun community involvement through presentations to community groups and close communication with recognized community leaders.

Further steps toward cooperation and interaction could include:

- Planning paths, roads, and bikeways that link neighboring communities; and
- Encouraging inter-community activities through community associations, sports leagues, and regional events.

The project is currently separated from nearby communities by gullies and a proposed golf course. These limit the possibility of creating a continuous landscape, rather than a set of discontinuous subdivisions. Nonetheless, the project developer can consider landscaping and design choices that minimize incongruity between nearby areas. (First, however, it may be necessary to learn whether harmonious design is wanted or even thought possible. There may be little point in making parts of the project harmonize in design with the old plantation villages if the City's new development, surrounding those villages, does not.)

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**APPENDIX A:
DETAILED EXHIBITS ON
EXISTING CONDITIONS**

Appendix A
1. DEMOGRAPHIC CHARACTERISTICS, SELECTED DP AREAS, 1990

	Honolulu County	SELECTED DP AREAS		
		Ewa (1)	Central (1)	Waianae
POPULATION	836,231	42,960	130,474	37,411
ETHNICITY				
Caucasian	32%	40%	30%	23%
Japanese	23%	9%	20%	6%
Filipino	14%	28%	24%	16%
Hawaiian	11%	10%	8%	41%
Other	20%	13%	18%	15%
AGE				
Less than 5 years	7%	10%	10%	10%
5 to 17 years	17%	21%	20%	26%
18 to 34 years	31%	35%	34%	27%
35 to 64 years	34%	29%	29%	30%
65 or more years	11%	5%	6%	7%
Median age (years)	32.2	N/A	N/A	26.3
EDUCATION OF PERSONS AGED 25 & OVER (2)				
High School Diploma (3)	81%	80%	82%	69%
College Degree (4)	33%	25%	29%	15%
PERSONS AGED 5 & OVER WHO SPEAK A LANGUAGE OTHER THAN ENGLISH AT HOME (2)	26%	24%	26%	19%
PERSONS WITH MOBILITY OR SELF-CARE LIMITATIONS (2)				
% of persons aged 16 to 64	4%	5%	4%	6%
% of persons aged 65 or more	18%	20%	20%	26%

NOTES: (1) See Appendix A-6 for a detailed list of equivalent Census regions for these Development Plan Areas.
(2) Based on 15% sample; hence, figures represent estimates only.
(3) All persons with a high school diploma, including those with college education.
(4) Includes Associate, Bachelor's, and graduate degrees.

SOURCES: U.S. Bureau of the Census, 1992, 1991.

Appendix A
2. GEOGRAPHIC MOBILITY, SELECTED DP AREAS, 1990 (1)

	Honolulu County	SELECTED DP AREAS		
		Ewa	Central	Waianae
PERSONS (2)				
PLACE OF BIRTH				
Born in Hawaii	54%	46%	51%	74%
Other U.S.-born (3)	30%	38%	35%	18%
Foreign-born	16%	16%	15%	8%
RESIDENCE 5 YEARS PREVIOUS FOR PERSONS AGED 5 & OVER				
Same house	50%	38%	43%	55%
Same county, different house	26%	29%	27%	33%
Same state, different county	1%	1%	1%	1%
Different state	17%	26%	24%	9%
Lived abroad	5%	6%	6%	2%
HOUSEHOLDERS (2)				
WHEN HOUSEHOLDER MOVED INTO UNIT				
In the last 5 years	53%	66%	62%	52%
6 to 20 years ago	29%	26%	26%	35%
21 to 30 years ago	10%	6%	8%	7%
31 years ago or more	8%	3%	4%	6%

NOTES: (1) Based on 15% sample; hence, figures represent estimates only.
(2) Base figures used in calculating these data may be different than in 100% count.
(3) Includes persons born in U.S. territories, and persons born abroad or at sea to American parents.

SOURCE: U.S. Bureau of the Census, 1992.

Appendix A
3. HOUSING CHARACTERISTICS, SELECTED DP AREAS, 1990

	Honolulu County	SELECTED DP AREAS		
		Ewa	Central	Waianae
HOUSING UNITS	281,683	11,734	36,260	10,680
TOTAL VACANT UNITS	6%	3%	2%	12%
Seasonal/recreational	2%	0%	0%	4%
AGE OF STRUCTURE (1)				
1 year	2%	7%	3%	1%
2 to 10 to years	14%	15%	28%	13%
11 to 20 years	30%	29%	29%	42%
21 years or more	54%	48%	40%	44%
UNITS IN STRUCTURE				
1 unit	55%	80%	65%	70%
2 to 4 units	7%	7%	9%	5%
5 or more units	36%	11%	24%	23%
Trailer, other	1%	1%	1%	2%
NOT COMPLETE PLUMBING (1)	1%	0%	0%	1%
HOUSEHOLDS	265,304	11,434	35,443	9,417
HOUSEHOLD TYPE				
1 or more non-relatives	12%	12%	10%	15%
No non-relatives	88%	88%	90%	85%
TENURE				
Owner-occupied	52%	53%	55%	52%
Renter-occupied	48%	47%	45%	48%
PERSONS PER HOUSEHOLD	3.02	3.66	3.49	3.93
CROWDED HOUSEHOLDS				
Mildly crowded (2)	8%	11%	10%	16%
Very crowded (3)	8%	9%	8%	18%
MEAN VALUE (4)	\$312,624	\$232,270	\$265,169	\$168,784

NOTES: (1) Based on 15% sample; hence, figures represent estimates only.
(2) Indicated by households with 1.00 to 1.50 persons per room.
(3) Indicated by households with 1.51 or more persons per room.
(4) For owner-occupied, non-condominium housing units.

SOURCES: U.S. Bureau of the Census, 1992, 1991.

Appendix A
4. INCOME CHARACTERISTICS, SELECTED DP AREAS, 1990 (1)

	Honolulu County	SELECTED DP AREAS		
		Ewa	Central	Waianae
HOUSEHOLDS (2)				
INCOME LEVEL				
Lowest (3)	13%	9%	11%	22%
Highest (4)	17%	12%	15%	9%
Mean Income (5)	\$49,959	\$44,759	\$47,540	\$38,310
Interquartile Range (6)	\$43,154	\$36,073	\$39,906	\$35,239
WITH SELECTED INCOME SOURCES				
Social Security Income	24%	15%	17%	23%
Retirement Income	20%	17%	17%	21%
Public Assistance Income	6%	6%	8%	22%
OWNER HOUSING COSTS (7)				
35% or more of Household Income	15%	21%	20%	14%
Mean Monthly Costs	\$909	\$968	\$1,041	\$607
RENTER HOUSING COSTS (8)				
35% or more of Household Income	34%	36%	37%	44%
Mean Gross Rent	\$711	\$810	\$717	\$617
Mean Contract Rent (9)	\$655	\$738	\$652	\$551
POPULATION (2)				
PERSONS BELOW POVERTY LEVEL				
% of persons aged 18 to 64	7%	5%	7%	19%
% of persons aged 65 or more	6%	4%	5%	15%
% of related children aged less than 18	8%	4%	9%	14%
% of unrelated individuals	10%	5%	10%	26%
	19%	17%	18%	33%

- NOTES:** (1) Based on 15% sample (except "Mean Contract Rent"); hence, figures represent estimates only.
(2) Base figures used in calculating this data may be different than in 100% count.
(3) Incomes of less than \$15,000 (based on lowest 14.8% of incomes statewide).
(4) Incomes of \$75,000 or more (based on highest 15.8% of incomes statewide).
(5) In 1989 dollars.
(6) A smaller range means less difference between rich and poor, while a larger range means a greater difference between rich and poor.
(7) Owner costs include (but are not limited to) mortgage, real property tax, property insurance, utilities, and fuels.
(8) Renter costs include (but are not limited to) rent, utilities, and fuels.
(9) Monthly cash rent only. Does not include other costs.

SOURCES: U.S. Bureau of the Census, 1992, 1991.

Appendix A
5. LABOR FORCE CHARACTERISTICS, SELECTED DP AREAS, 1990 (1)

	Honolulu County	SELECTED DP AREAS		
		Ewa	Central	Waianae
POPULATION AGED 16 & OVER	651,920	30,788	94,346	24,973
In Armed Forces	8%	17%	16%	2%
POTENTIAL CIVILIAN LABOR FORCE	598,371	25,556	78,949	24,377
In Civilian Labor Force	69%	71%	72%	62%
CIVILIAN LABOR FORCE	410,023	18,081	57,071	15,107
MALE				
Labor force participation (2)	75%	79%	79%	71%
Unemployed	4%	5%	4%	8%
FEMALE				
Labor force participation (2)	63%	64%	67%	53%
Unemployed	3%	5%	4%	8%
EMPLOYED CIVILIAN LABOR FORCE	395,811	17,120	54,571	13,901
BY SELECTED INDUSTRY				
Agriculture, forestry, fisheries, mining	2%	2%	2%	4%
Construction	7%	8%	8%	12%
Manufacturing	6%	9%	8%	8%
Transportation	7%	7%	7%	7%
Retail trade	19%	20%	19%	17%
Finance, insurance, real estate	8%	7%	7%	4%
Personal, entertainment, recreation	8%	6%	7%	7%
Health, education, professional	22%	17%	19%	19%
Public administration	9%	11%	12%	9%
BY OCCUPATION				
Managerial, professional	28%	18%	23%	17%
Technical, sales, support	35%	35%	35%	27%
Service	17%	18%	17%	18%
Farming, forestry, fishing	2%	2%	2%	4%
Precision, craft, repair	10%	13%	12%	14%
Operators, cleaners, laborers	9%	14%	11%	20%
COMMUTE TO WORK				
More than 45 minutes	16%	21%	20%	40%
Mean travel time (minutes)	25	N/A	N/A	36

NOTES: (1) Based on 15% sample; hence, figures represent estimates only.
(2) Calculated by dividing "Civilian Labor Force" by "Potential Civilian Labor Force."

SOURCE: U.S. Bureau of the Census, 1992.

Appendix A
6. 'EWA AND CENTRAL DP AREAS IN CENSUS TERMS

Region	1990 Population
'EWA DP AREA	42,983
APPROXIMATE CENSUS AREAS	42,960
Tract 83.01	5,786
Tract 83.02	6,699
Tract 87.98 (BG 9 only)	826
Tract 84	9,677
Tract 85	4,529
Tract 86.03 (all except BG 1)	5,907
Tract 86.04	4,015
Tract 86.98	5,521
DIFFERENCE	23
<hr/>	
CENTRAL DP AREA	130,474
APPROXIMATE CENSUS AREAS	130,474
Tract 82	0
Tract 86.03 (BG 1 only)	602
Tract 87.01	7,598
Tract 87.02	4,161
Tract 87.98 (all except BG 9)	3,645
Tract 88	6,172
Tract 89.01	8,084
Tract 89.04	5,183
Tract 89.05	7,561
Tract 89.06	4,025
Tract 89.07	4,560
Tract 89.08	6,688
Tract 89.09	3,779
Tract 89.10	10,444
Tract 89.11	11,893
Tract 89.12	2,193
Wahiawa Division (1)	43,886
DIFFERENCE	0

NOTE: (1) Comprised of Tracts 90, 91, 92, 93, 94, 95.01, 95.02, 95.03, 95.04, and 95.05

SOURCES: U.S. Bureau of the Census, 1992.
Steve Young, City & County Planning Department ('Ewa DP — 2/13/92; Central DP — 8/8/94).

Appendix A
7. EXISTING & PLANNED RESIDENTIAL DEVELOPMENTS IN 'EWA

Existing & Planned Developments		Units		Year (to be) Completed
Description	Developer	Number	Type	
CITY OF KAPOLEI Mauka Makai		750 2,000		1996 to 2010
'EWA BY GENTRY 1,000 acres Coronado Palm Court & Palm Villas Soda Creek I and II Summerhill Sun Terra Sun Rise Sun Terra on the Park Sun Terra South The Arbors	Gentry Development Co.	8,000		2000
'EWA MARINA 1,100 acres Residential Units Visitor Units Marina 27-hole Golf Course Health/Fitness Center Maritime Commercial Center	HASEKO ('Ewa) Inc.	4,850 950 1,400	10 to 30% affordable boat slips	Projected construction start-time is 1995 1995 to 2010 or 2015
EWA VILLAGES 610 acres Tenney Village Varona Village Renton Village New Residential Development Elementary School Neighborhood Retail Center Parks/Recreation Facilities 18-hole Municipal Golf Course Historical Buildings Restoration	DHCD (2)	273 957 17 acres 252 acres	revitalize existing 60% affordable 40% market	8-phase project 1997 to 2000 Under construction
KAPOLEI KNOLLS 79.5 acres	Finance Realty	380	single-family & market	200 units, Dec. 1995
KO'OLINA 1,000 acres Phase I: Residential Units Visitor Units Marina 18-hole Golf Course Clubhouse 'ihani Resort Sandy Beaches Hawaiian Cultural Center Shopping Center Restaurants	West Beach Estates	3,700 1,500 4,000 350-400 1 4	apt./condo. med.-rise low-density/golf course slips	Groundbreaking: 1986 Completed Open

Existing & Planned Developments		Units Number	Year (to be) Completed
Description	Developer		
Phase II: Residential Units Hotels Local Commercial Center 18-hole Golf Course		3,500 2	Undetermined
MAKAIWA HILLS 2,000 acres Residential Regional Mall Public Parks Elementary School	Campbell Estate	market & affordable 1,066 single-/multi-family 1 M s.f.	Groundbreaking: 1996 2001 to 2010
MAKAKILO Cambridge Park WestPark at Makakilo Heights Palehua Pointe Palehua Nani & Palehua Villas Makakilo Cliffs Makakilo Cluster Park Makakilo Ridge Royal Ridge Westview at Makakilo Heights	Finance Realty	6,174 112 affordable 47 lots 23 affordable 24 40	1962 to 1999
THE VILLAGES OF KAPOLEI 890 acres V.1. Kumu 'Iki V.2. A'elo V.3. Malanai V.4. Kekuilani V.5. Kulalani V.6 Pae Ko Gardens V.7 V.8 Elementary School Intermediate School High School Commercial Services Community Park Recreation Center 18-hole Public Golf Course	Schuler Homes, Inc.	72 single-family, fee simple 500 townhomes, 10% afford.	Phase I, Nov. 1993
	HFDC (3)		2005
	Castle & Cooke Properties, Inc.	519	1991
	Watt Hawai'i	571 mixed density	late 1994
	Watt Hawai'i	384	1992
	Waieli Development Corp.	645 mixed density	1st delivery, 1994
	West Beach Estates	128 multi-family townhomes	Occupancy July 1994
	Kumi Kei Development	128 multi-family townhomes	Occupancy Dec. 1994
	Watt Hawai'i	492	
	Waieli Development Corp.	618	
		2	1993: Kapolei Elem.
		1	
		1	1998 school year
WEST LOCH SUBDIVISIONS 500 acres Phase I subdivision West Beach Estates West Loch Fairways Townhomes Project West Loch Village for the Elderly and Disabled Commercial Center Church Child Care Center Asing Community Park 18-hole Municipal Golf Course 40-acre Shoreline Park	DHCD/West Loch, Inc.	593	1989
		718 single-/multi-family 136 multi-family rental	1994 1993
	Fletcher Pacific, Inc.	150	1993
			1990

NOTES: (1) Inventory as of late 1994. Non-residential components shown in italics.
(2) DHCD = Department of Housing & Community Development.
(3) HFDC = Housing & Finance Development Corporation.

SOURCES: Calls to developers by CRI, 1994; Honolulu Planning Department, 1992, 1993; Atwater, 1994. The Estate of James Campbell, 1993a, 1993b, 1993c; Helber Hastert & Fee, Planners, 1992.

Appendix A
8. DEMOGRAPHIC CHARACTERISTICS, SELECTED `EWA AREAS, 1990

	Honolulu County	Barber's Point	`Ewa Beach	`Ewa Villages	Makakilo	`Ewa Gentry
POPULATION	836,231	2,218	14,315	3,780	9,828	1,992
ETHNICITY						
Caucasian	32%	76%	23%	8%	47%	31%
Japanese	23%	1%	9%	14%	10%	18%
Filipino	14%	8%	39%	67%	16%	28%
Hawaiian	11%	1%	17%	5%	13%	7%
Other	20%	15%	12%	5%	14%	15%
AGE						
Less than 5 years	7%	19%	7%	7%	8%	10%
5 to 17 years	17%	10%	23%	21%	19%	15%
18 to 34 years	31%	61%	30%	27%	34%	46%
35 to 64 years	34%	9%	33%	30%	36%	27%
65 or more years	11%	0%	7%	15%	3%	3%
Median age (years)	32.2	24.7	28.6	32.4	29.8	28.4
EDUCATION OF PERSONS AGED 25 & OVER (1)						
High School Diploma (2)	81%	90%	71%	55%	90%	88%
College Degree (3)	33%	15%	17%	12%	37%	37%
PERSONS AGED 5 & OVER WHO SPEAK A LANGUAGE OTHER THAN ENGLISH AT HOME (1)	26%	15%	29%	46%	16%	24%
PERSONS WITH MOBILITY OR SELF-CARE LIMITATIONS (1)						
% of persons aged 16 to 64	4%	2%	6%	4%	5%	3%
% of persons aged 65 or more	18%	0%	18%	22%	15%	0%

NOTES: (1) Based on 15% sample; hence, figures represent estimates only.
(2) All persons with a high school diploma, including those with college education.
(3) Includes Associate, Bachelor's, and graduate degrees.

SOURCES: U.S. Bureau of the Census, 1992, 1991.

Appendix A
9. GEOGRAPHIC MOBILITY, SELECTED `EWA AREAS, 1990 (1)

	Honolulu County	Barber's Point	`Ewa Beach	`Ewa Villages	Makakilo	`Ewa Gentry
PERSONS (2)						
PLACE OF BIRTH						
Born in Hawaii	54%	13%	63%	62%	45%	52%
Other U.S.-born (3)	30%	78%	18%	5%	43%	31%
Foreign-born	16%	9%	20%	33%	12%	17%
RESIDENCE 5 YEARS PREVIOUS FOR PERSONS AGED 5 & OVER						
Same house	50%	2%	61%	43%	40%	2%
Same county, different house	26%	5%	29%	50%	29%	76%
Same state, different county	1%	0%	1%	1%	1%	2%
Different state	17%	79%	6%	3%	25%	16%
Lived abroad	5%	14%	3%	4%	6%	3%
HOUSEHOLDERS (2)						
WHEN HOUSEHOLDER MOVED INTO UNIT						
In the last 5 years	53%	99%	39%	56%	64%	100%
6 to 20 years ago	29%	1%	49%	23%	26%	0%
21 to 30 years ago	10%	0%	8%	3%	10%	0%
31 years ago or more	8%	0%	3%	18%	0%	0%

NOTES: (1) Based on 15% sample; hence, figures represent estimates only.
(2) Base figures used in calculating these data may be different than in 100% count.
(3) Includes persons born in U.S. territories, and persons born abroad or at sea to American parents.

SOURCE: U.S. Bureau of the Census, 1992.

Appendix A
10. HOUSING CHARACTERISTICS, SELECTED `EWA AREAS, 1990

	Honolulu County	Barber's Point	`Ewa Beach	`Ewa Villages	Makakilo	`Ewa Gentry
HOUSING UNITS	281,683	866	3,426	939	3,050	752
TOTAL VACANT UNITS	6%	1%	2%	4%	2%	6%
Seasonal/recreational	2%	0%	0%	0%	0%	0%
AGE OF STRUCTURE (1)						
1 year	2%	1%	1%	5%	1%	71%
2 to 10 to years	14%	1%	7%	43%	28%	29%
11 to 20 years	30%	5%	41%	1%	44%	0%
21 years or more	54%	93%	52%	51%	27%	0%
UNITS IN STRUCTURE						
1 unit	55%	49%	86%	95%	79%	50%
2 to 4 units	7%	19%	4%	2%	7%	5%
5 or more units	36%	30%	9%	1%	13%	44%
Trailer, other	1%	2%	1%	3%	1%	1%
NOT COMPLETE PLUMBING (1)	1%	0%	1%	0%	0%	0%
HOUSEHOLDS	265,304	854	3,355	902	2,978	708
HOUSEHOLD TYPE						
1 or more non-relatives	12%	2%	15%	8%	16%	17%
No non-relatives	88%	98%	85%	92%	84%	83%
TENURE						
Owner-occupied	52%	0%	69%	66%	74%	80%
Renter-occupied	48%	100%	31%	34%	26%	20%
PERSONS PER HOUSEHOLD	3.02	2.52	4.26	4.18	3.30	2.81
CROWDED HOUSEHOLDS						
Mildly crowded (2)	8%	4%	17%	21%	7%	10%
Very crowded (3)	8%	1%	15%	21%	5%	7%
MEDIAN VALUE (4)	\$283,600	\$275,000	\$216,900	\$116,500	\$246,600	\$277,600

NOTES: (1) Based on 15% sample; hence, figures represent estimates only.
(2) Indicated by households with 1.00 to 1.50 persons per room.
(3) Indicated by households with 1.51 or more persons per room.
(4) For owner-occupied, non-condominium housing units.

SOURCES: U.S. Bureau of the Census, 1992, 1991.

Appendix A
11. INCOME CHARACTERISTICS, SELECTED `EWA AREAS, 1990 (1)

	Honolulu County	Barber's Point	`Ewa Beach	`Ewa Villages	Makakilo	`Ewa Gentry
HOUSEHOLDS (2)						
INCOME LEVEL						
Lowest (3)	13%	14%	11%	13%	3%	5%
Highest (4)	17%	1%	16%	8%	20%	8%
Median Income (5)	\$40,581	\$23,908	\$45,184	\$40,924	\$50,284	\$45,824
Interquartile Range (5)	\$43,154	\$13,490	\$37,672	\$37,023	\$34,317	\$33,156
WITH SELECTED INCOME SOURCES						
Social Security Income	24%	3%	23%	47%	10%	7%
Retirement Income	20%	3%	28%	32%	17%	8%
Public Assistance Income	6%	1%	14%	5%	3%	3%
OWNER HOUSING COSTS (7)						
35% or more of Household Income	15%	N/A	16%	12%	24%	38%
Median Monthly Costs	\$1,121	N/A	\$910	\$710	\$1,268	\$1,393
RENTER HOUSING COSTS (8)						
35% or more of Household Income	34%	15%	31%	5%	46%	78%
Median Gross Rent	\$663	\$664	\$755	\$127	\$971	\$923
Median Contract Rent (9)	\$615	\$644	\$701	\$99	\$960	\$907
POPULATION (2)						
PERSONS BELOW POVERTY LEVEL						
% of persons aged 18 to 64	7%	1%	7%	1%	3%	6%
% of persons aged 65 or more	6%	1%	6%	1%	3%	4%
% of persons aged 65 or more	8%	0%	4%	3%	4%	0%
% of related children aged less than 18	10%	2%	7%	1%	4%	8%
% of unrelated individuals	19%	0%	29%	20%	6%	8%

- NOTES:**
- (1) Based on 15% sample (except "Median Contract Rent"); hence, figures represent estimates only.
 - (2) Base figures used in calculating this data may be different than in 100% count.
 - (3) Incomes of less than \$15,000 (based on lowest 14.8% of incomes statewide).
 - (4) Incomes of \$75,000 or more (based on highest 15.8% of incomes statewide).
 - (5) In 1989 dollars.
 - (6) A smaller range means less difference between rich and poor, while a larger range means a greater difference between rich and poor.
 - (7) Owner costs include (but are not limited to) mortgage, real property tax, property insurance, utilities, and fuels.
 - (8) Renter costs include (but are not limited to) rent, utilities, and fuels.
 - (9) Monthly cash rent only. Does not include other costs.

SOURCES: U.S. Bureau of the Census, 1992, 1991.

Appendix A

12. LABOR FORCE CHARACTERISTICS, SELECTED 'EWA AREAS, 1990 (1)

	Honolulu County	Barber's Point	'Ewa Beach	'Ewa Villages	Makakilo	'Ewa Gentry
POPULATION AGED 16 & OVER	651,920	1,681	10,499	2,855	7,286	1,634
In Armed Forces	8%	52%	3%	1%	13%	12%
POTENTIAL CIVILIAN LABOR FORCE	598,371	802	10,221	2,831	6,306	1,443
In Civilian Labor Force	69%	73%	70%	67%	76%	87%
CIVILIAN LABOR FORCE	410,023	589	7,129	1,899	4,768	1,255
MALE						
Labor force participation (2)	75%	82%	76%	72%	84%	94%
Unemployed	4%	21%	6%	5%	5%	1%
FEMALE						
Labor force participation (2)	63%	71%	63%	62%	67%	81%
Unemployed	3%	21%	4%	5%	4%	1%
EMPLOYED CIVILIAN LABOR FORCE	395,811	466	6,773	1,808	4,541	1,243
BY SELECTED INDUSTRY						
Agriculture, forestry, fisheries, mining	2%	1%	1%	11%	1%	0%
Construction	7%	9%	9%	6%	8%	7%
Manufacturing	6%	3%	8%	13%	9%	10%
Transportation	7%	4%	7%	7%	8%	7%
Retail trade	15%	29%	24%	20%	16%	16%
Finance, insurance, real estate	8%	7%	7%	5%	6%	11%
Personal, entertainment, recreation	8%	4%	7%	8%	4%	7%
Health, education, professional	22%	20%	15%	10%	20%	16%
Public administration	9%	19%	7%	9%	15%	15%
BY OCCUPATION						
Managerial, professional	28%	15%	12%	9%	26%	26%
Technical, sales, support	35%	39%	34%	27%	36%	36%
Service	17%	28%	22%	20%	13%	14%
Farming, forestry, fishing	2%	0%	1%	8%	1%	0%
Precision, craft, repair	10%	13%	14%	13%	13%	11%
Operators, cleaners, laborers	9%	5%	17%	23%	10%	12%
COMMUTE TO WORK						
More than 45 minutes	16%	5%	31%	22%	19%	30%
Mean travel time (minutes)	25	13	34	29	29	33

NOTES: (1) Based on 15% sample; hence, figures represent estimates only.
 (2) Calculated by dividing "Civilian Labor Force" by "Potential Civilian Labor Force."

SOURCE: U.S. Bureau of the Census, 1992.

APPENDIX B:
KEY INFORMANTS

Appendix B KEY INFORMANTS

The following list acknowledges persons interviewed by Community Resources, Inc. in September 1994, to learn of community expectations and concerns. Positions and/or organizational affiliations are mentioned to indicate the range and variety of interested parties. Interviewees were not asked to speak on behalf of their organizations.

KEY INFORMANT	POSITION AND/OR ORGANIZATION
Jeffrey R. Alexander	President, Save 'Ewa Beach 'Ohana 'Ewa Neighborhood Board 'Ewa Beach Resident
Richard Beamer	President, 'Ewa Beach Community Association
John Bickel	Former Chair, 'Ewa Beach Neighborhood Board Former Teacher, Campbell High School Former 'Ewa Beach Resident
Ka'uila Clark	President, West O'ahu Employment Corporation
Kathy Cozzens	Renton Village Resident Board Member, Friends for 'Ewa
Henry Eng	Manager, Land Planning, Estate of James Campbell
Sue Flint	'Ewa Beach Resident Member, Save 'Ewa Beach 'Ohana
James Floody	President, 'Ewa by Gentry Community Association
Cynthia Fu	Manager, 'Ewa Beach Branch, First Hawaiian Bank President, 'Ewa Beach Shopping Center Merchants' Association Member, 'Ewa Beach Professional Business Association Member, 'Ewa Beach Community Association
David A. Gilbert	Chair, 'Ewa Neighborhood Board Makakilo Resident
Alan Gottlieb	Part-Owner, Kahua Nursery
LaVerne Hatch	President, Makakilo Community Association President, Ahahui Siwila Hawai'i O Kapolei
Deborah Higa	Vice President, West O'ahu Employment Corporation
David Kawamura	Manager, Foodland at 'Ewa Beach Shopping Center Member, 'Ewa Beach Business Association
Terri Kita	Assistant to the Manager, Villages of Kapolei Association Kapolei Resid
Ellie Kupau	President, D.E. Thompson Senior Village Trustee, 'Ewa Villages Community Association

KEY INFORMANT	POSITION AND/OR ORGANIZATION
Florence Lomaoang	Member, 'Ewa Villages Non-Profit Development Corp. Tenney Village Resident
Paula Loring	President, Kapolei Elementary School Kapolei Resident
Richard Lyman	President, West Loch Fairways Community Association
Emogene Martin	President, Friends for 'Ewa 'Ewa Resident
Eric Murakami	Manager, Kapolei Safeway
Irene Nakamoto	Principal, 'Ewa Elementary School
Eleanor Niino	Fernandez Village Resident Board Member, 'Ewa Villages Community Association Volunteer, 'Ewa Elementary School
Jane Oamiida	Vice President, Friends for 'Ewa 'Ewa Beach Resident
Pastor David Parker	Pastor, Friendship Bible Church Director, Friendship Youth Center
Rodolfo V. Ramos	President, 'Ewa Villages Community Association Member, 'Ewa Neighborhood Board
Frances Rivero	Program Coordinator, Boys and Girls Club of 'Ewa Beach Board Member, HASEKO 'Ewa Beach Coordinating Council Board Member, 'Ewa Beach Community Association
Karl Tamura	Renton Village Resident
Arline E. West	Member, 'Ewa Neighborhood Board Employment Counselor, DHS-JOBS Wai'anāe Makakilo Resident
Roy Wickramaratna	Makakilo Resident President, Makakilo Senior Citizens Club Member, Barbers Point Re-Use and Environmental Committees Former President, Makakilo Community Association Former President, Makakilo Gardens II Homeowners' Association
Michael K.H. Wong	Member, 'Ewa Neighborhood Board Kapolei Resident
Robert Yu	President, West Loch Estates Community Association

**APPENDIX C:
COMMUNITY INTERVIEW
GUIDE & HANDOUT**

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Appendix C
1. COMMUNITY INTERVIEW GUIDE

A: QUESTIONS FOR PARTICULAR INTERVIEWEES

For Residents of a Particular Neighborhood

1. How long have you lived in `Ewa?
2. How old is your neighborhood?
3. How long have your neighbors lived in this neighborhood?
4. How well do your neighbors know one another? Would you say there's a sense of "neighborhood" there?
5. What kinds of issues or problems has your neighborhood dealt with in the last one or two years? How were these issues or problems resolved? Does your neighborhood have a residents' association that addresses these types of issues?
6. Are there issues that your neighborhood is currently dealing with? What are they?

For Community Associations of Residential Developments

1. When was your community association formed?
2. What is the purpose of the community association?
3. Who can be a member of the association?
4. Currently, how many members are there?
5. What kinds of issues or concerns is the association presently addressing?
6. What kinds of supports — through volunteers, activities, dedicated space, equipment — does your association provide for residents of your development?

7. Does your association maintain any contact with other `Ewa community associations? Which ones? What kinds of things do you discuss with one another? Do the associations get together and talk about regional matters, or is that done only through the `Ewa Neighborhood Board?
8. Who in these associations can you suggest I talk to?

For Local Businesses or Business Associations

1. How long has your business been in `Ewa? Why did you decide to locate your business in `Ewa?
2. What issues or concerns must a business person in `Ewa confront? What are the top three issues that a business person in this region must address?

For Civic Organizations

1. When was your organization formed? What is its purpose/mission?
2. What does your organization do?
3. Who can join your organization?
4. What kinds of issues and concerns does your organization address?
5. What are the needs of people in the `Ewa region?
6. Do you see your organization helping to fulfill these needs? How so?
7. Does your organization ever team up with other groups in the `Ewa region? What kinds of things do you discuss or work on?

For Human Services

1. What is the mission of your organization?
2. How long has your organization been in the `Ewa region?
3. What kinds of programs and services does your organization offer?
4. Who can take part in them? (probe for criteria: age, income level, geographic boundary, referral sources, other)

5. Do you charge a fee for your programs or services?
6. About how many participants are there currently? Are most of them from the `Ewa region?
7. What kinds of needs do people in `Ewa have?
8. Does your organization have any plans to expand or upgrade your program(s) or facilities in that community?
9. Are there are other organizations in the community that you work with?

B: QUESTIONS FOR ALL INTERVIEWEES

Regional Change

1. Is there anything about `Ewa that you wish would stay the same? What are some threats to the things you value about this place?
2. How have things changed in `Ewa?
3. What would you like to change?
4. What do you think `Ewa will be like in ten or twenty years?
5. What kind of future would you like for `Ewa?
6. What is needed to make this future come true? What are some present obstacles? What are the things (people, things, activities) right now that can make it happen?

[Use Kapolei Area Long-Range Master Plan map to orient interviewee, if needed, for the following questions.]
7. What are your thoughts about `Ewa becoming a major urban center? What are your thoughts about the various planned projects and projects in development? Do you think it will make `Ewa a better place to live? (If so, how? If not, why not?)
8. How do you think these developments will change `Ewa? [For local businesses: How will regional development affect your business? Existing small businesses?]

9. The naval air station at Barbers Point is scheduled to close sometime 1997. How will `Ewa be affected by this closing?

Project (Impacts and Mitigations)

[Present map of Schuler project and briefly describe the proposed project, which is over 1,022 acres]

1. What kind of impacts do you expect from this project — for your neighborhood, for `Ewa, for the island [vary the order]? [Check for impacts to: infrastructure, traffic, social (affiliation, crime, need for services and other types of supports), education, other.]
2. How can the negative impacts be prevented or minimized?

[Get at how the addition of 10,000 homes over 20 years will figure into the future-scape of `Ewa.]
3. How will `Ewa benefit from this project? How about the island? How about your neighborhood?
4. How well does the project "fit" with the other `Ewa communities?

Appendix C
2. INTERVIEW HANDOUT

PROJECT DESCRIPTION OF SCHULER EAST KAPOLEI PROJECT

Schuler Homes, working with the Galbraith Trust, proposes to develop a residential area in 'Ewa. The land was planted in sugar, but will otherwise be vacant when Oahu Sugar closes. The project includes homes, small parks, a school, and small commercial areas. The project would take quite a while to build out. The first house could be built by 1997, but the project still might not be finished until some time after 2020. Phase 1, on the south side of the project, would be built between 1996 and perhaps 2004. Only when it's finished would Schuler move on to the northern Phase 2 section.

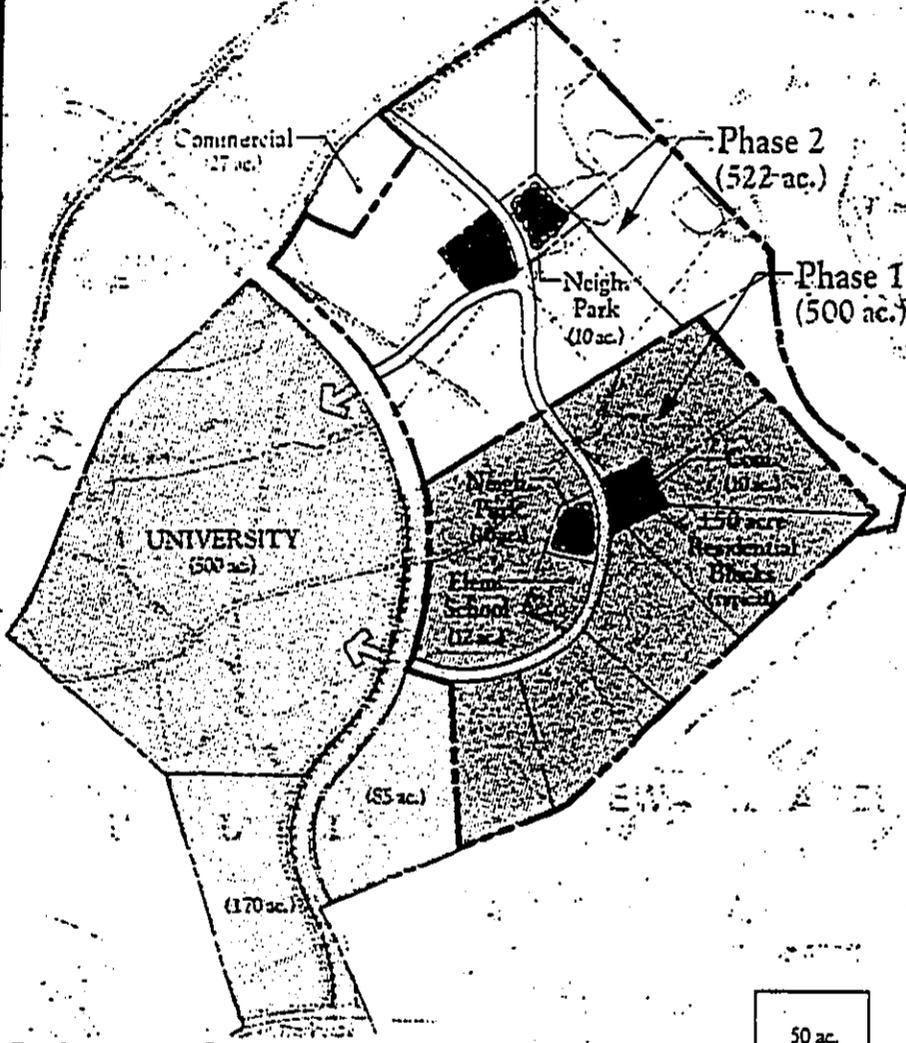
Phase 1 would include about 5,000 housing units. These would be a mix of single-family and multi-family homes. The homes will be marketed to island residents, much as Schuler Homes' other projects are. Phase 2 would be similar in size to Phase 1.

(The Phase 1 land is being transferred to the Galbraith Estate by the State, in exchange for pineapple land up near Wahiawa. It's part of the agreement between Schuler Homes and the Galbraith Estate, that Phase 1 is developed first.)

Community Resources, Inc. is an independent consulting firm, working on a socio-economic impact assessment of the Schuler project. We will discuss the major findings of these interviews in our report, and will list the people we spoke with. We will not identify opinions as coming from any particular person.

Land Use Summary (Acres)			
Land Use	Phase 1	Phase 2	Total
Residential	458	490	826
Commercial	10	10	20
School	12	0	12
Parks	10	10	20
Circulation	10	12	22
Total	500	522	1,022

1,300 acre State Parcel



July 14, 1994

Preliminary Concept Plan
EAST KAPOLEI PROJECT

Schuler Homes, Inc./Hawaiian Trust Co., Ltd.



**APPENDIX D:
RESIDENTS' ISSUES & CONCERNS
RELATED TO THE PROJECT**

**Appendix D
RESIDENTS' ISSUES & CONCERNS RELATED TO PROJECT**

ISSUE/CONCERN	COMMENT (1)
Traffic	Concerned that increase in resident population will aggravate existing traffic congestion.
Inadequate infrastructure: Safe accesses for pedestrians	Assure that safe pedestrian accesses are constructed from project to adjacent properties along the North-South Road.
Inadequate facilities:	Great concern based on recent experiences with new residential developments.
Parks	Residents of project may have to use neighboring park facilities, aggravating the existing shortage of park space. Loss of green space and views.
Schools	Overtax existing school facilities. Development will attract more students to the private school.
Land for churches	
Community Character	Schuler development will reinforce the evolving bedroom character of 'Ewa.
"Turf" Conflicts over Common Areas	Possible clashes between people (including youth) of different socio-economic groups on common areas such as neighborhood parks.
Inflated Property Taxes	Having a community of new homes next to an old neighborhood may increase property taxes for existing residents, who cannot afford the increase.
Early Childhood Education & Care	Increased need for quality child services.
Construction Dust	Construction dust may aggravate respiratory conditions.
Crime	The development will decrease youth gangs, because the poor people will be "squeezed out" of the region and the new residents will spur community action.
General Aviation Airport at Barbers Point	Possible alternatives of runway design may include flight path over project area, affecting the project (noise, risk to areas under a flight path).
Urbanization	Growth in 'Ewa region will lead to the demise of agriculture and loss of rural identity. The development may escalate crime rates, by furthering the difference between the "haves" and the "have nots."
Housing in General	Will provide needed housing for O'ahu. Housing may not be affordable for many leeward residents, thus providing no relief of housing shortage for leeward.
More Community	New people will join the community associations and offer fresh input. More friendship and community activities.
Employment	Will increase short-term employment on construction jobs.

NOTE: (1) Comments expand on interviewees' statements. These are not assessments by CRI.

**APPENDIX E:
REFERENCES**

**Appendix E
REFERENCES**

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Appendix F

Environmental Noise Assessment, East Kapolei Project
Darby & Associates, September 1994

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#94-20

ENVIRONMENTAL NOISE ASSESSMENT
SCHULER-EWA DEVELOPMENT
EWA, OAHU, HAWAII

SEPTEMBER 16, 1994

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1.0 SUMMARY

- 1.1 The proposed project site is currently exposed to low ambient noise levels of approximately 48 to 55 dBA which is typical of rural areas. The dominant noise sources include wind in foliage and occasional distant aircraft flyovers.
- 1.2 Nearby noise sensitive areas include the Ewa Villages which currently experiences low ambient noise levels of approximately 47 to 50 dBA.
- 1.3 Traffic noise level increases along Farrington Highway due to additional traffic generated by the project will be negligible at locations along Farrington Highway.
- 1.4 The dominant noise source during project construction will probably be earth moving equipment, such as bulldozers and diesel-powered trucks. Any noise impact on the Ewa Villages from such activity should, however, be relatively short-term.
- 1.5 The day-night average sound level, Ldn, at the project site due to aircraft operations is less than 55 dBA, thus compatible with the State DOT residential land use guidelines. Although at times audible, infrequent aircraft operations associated with HIA and BPNAS should not significantly impact the proposed development.
- 1.6 Results indicate that residences along the interior arterials should be exposed to Ldn levels less than 65 dBA which corresponds to HUD's "Acceptable" Site.
- 1.7 Residences along Farrington Highway and North-South Road may be exposed to future day-night average sound levels, Ldn, greater than the HUD recommended limit of 65 dBA due to traffic noise if located too close to the roadways. Noise mitigation should be implemented to conform with HUD noise exposure guidelines for housing.

2.0 PROJECT DESCRIPTION

The Schuler-Ewa Development project involves 1,022 acres of land in Ewa, Oahu, Hawaii. The project site is located makai of Farrington Highway as shown in Figure 1. Currently, the project area is used for agriculture, specifically sugarcane. The project site is bordered to the south by Ewa Villages, to the east by sugarcane fields, and to the west by sugarcane fields. Sugarcane operations are slated to be phased out within a few years. The current development plan includes 10,750 residential units, schools, and parks. It is assumed that Phase 1 will be completed in 2005 with 5,000 units, and Phase 2 will be completed in 2011 with an additional 5,750 units. The Schuler-Ewa Development Plan is shown in Figure 2.

3.0 NOISE STANDARDS

Various local and federal agencies specify guidelines and standards in assessing environmental noise and set noise limits as a function of land use. A brief description of common acoustic terminology is presented in Appendix A.

- 3.1 State Department of Health - DOH specifies allowable property line noise levels that shall not be exceeded for more than 10% of the time during any 20-minute period [Reference 1]. These are enforced for any location at or beyond the property line. The specified noise limits vary depending on the land use and time of day as shown in Figure 3. DOH also specifies the following with respect to adjacent zoning and order of precedence.

"Where the allowable noise level between two adjacent zoning districts differ, the lower allowable noise level shall be used. For example, the allowable noise level for the residential district shall be used at the property line between residential and business districts.

The limits specified in the allowable noise levels table shall apply subject to the order of precedence in which uses were initiated after the effective date of this rule; provided that a new order of precedence is established when any use is discontinued. The initiation of use shall be measured by the date of rezoning. For example, if agricultural or industrial operations are conducted next to a lot used as residence, the agricultural or industrial limits would apply if the building permit for the residence was obtained after the agricultural or industrial operations had been initiated, after the effective date of this rule. Residential limits would apply if the building permit for the residence was obtained before agricultural or industrial operations had been initiated."

- 3.2 City and County of Honolulu Land Use Ordinance (LUO) - The Department of Land Utilization specifies maximum allowable levels at the property line [Reference 2]. The LUO criteria differ from those of the DOH in that they use octave band sound levels instead of A-weighted levels and no temporal factor is involved. LUO noise regulations are theoretically enforced by the Building Department, however, since they do not have noise measurement capability, noise complaints are usually handled by DOH.
- 3.3 State Department of Transportation, Airports Division - The Department of Transportation (DOT) specifies land use compatibility guidelines for aircraft noise exposure [Reference 3]. These guidelines are based on

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maximum allowable yearly day-night average sound levels, Ldn, for various specified land uses. A residential land use, which is specified as single-family homes, apartments, hotels, and resorts, is compatible with an aircraft generated Ldn less than or equal to 60 dBA. However, DOT states,

"Where the community determines that these uses must be allowed, Noise Level Reduction (NLR) measures to achieve interior levels of 45 Ldn or less should be incorporated into building codes and be considered in individual approvals. Normal local construction employing natural ventilation can be expected to provide an average NLR of approximately 9 dB. Total closure, plus air conditioning, may be required to provide additional outdoor to indoor NLR, and will not eliminate outdoor noise problems."

The DOT guidelines also specify 60 dBA as the maximum allowable Ldn level for school, day care center, and church uses without any mitigation measures. Commercial uses such as retail shops, restaurants, shopping centers, etc. are compatible with Ldn levels up to 65 dB without any mitigation measures. With noise mitigation measures implemented, such commercial uses are allowed in areas exposed to an Ldn as high as 75 dBA.

- 3.4 U.S. Federal Highway Administration - The Federal Highway Administration (FHWA) has established a set of design goals for traffic noise exposure [Reference 4]. The FHWA defines four land use categories and assigns corresponding maximum hourly equivalent sound levels, Leq. For example, Category B, defined as picnic and recreation areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals, has a corresponding maximum exterior Leq of 67 dBA and a maximum interior Leq of 52 dBA. These limits are viewed as design goals, and all projects which are developed to meet these limits are deemed in conformance with the FHWA noise standards.
- 3.5 U.S. Department of Housing and Urban Development - The U.S. Department of Housing and Urban Development (HUD) has established Site Acceptability Standards for interior and exterior noise for housing [Reference 5]. These standards are based on day-night average sound levels, Ldn, and identify the need for noise abatement, either at the site property line or in the building construction. HUD Site Acceptability Criteria rank sites as Acceptable, Normally Unacceptable, or Unacceptable. "Acceptable" sites are those where noise levels do not exceed an Ldn of 65 dBA. Housing on acceptable sites do not require additional noise attenuation other than that provided in customary building techniques. "Normally unacceptable" sites are those where the Ldn is above 65 dBA, but does not exceed 75 dBA. Housing on normally unacceptable sites requires some means of noise abatement, either at the property line or

in the building construction, to ensure the interior noise levels are acceptable. "Unacceptable" sites are those where the Ldn is 75 dBA or higher. The term "unacceptable" does not necessarily mean that housing cannot be built on these sites, but rather that more sophisticated sound attenuation would likely be needed.

- 3.6 U.S. Environmental Protection Agency - The U.S. Environmental Protection Agency (EPA) has identified a range of yearly day-night average sound levels, Ldn, sufficient to protect public health and welfare from the effects of environmental noise [Reference 6]. The EPA has established a goal to reduce exterior environmental noise to an Ldn not exceeding 65 dBA and a future goal to further reduce exterior environmental noise to an Ldn not exceeding 55 dBA. Additionally, the EPA states that these goals are not intended as regulations as they have no authority to regulate noise levels, but rather these goals are intended to be viewed as levels below which the general population will not be at risk from any of the identified effects of noise.

4.0 EXISTING ACOUSTICAL ENVIRONMENT

- 4.1 General - Ambient noise measurements were conducted on September 8, 1994 to assess the existing acoustical environment within and adjacent to the project site. The noise measurement locations are shown in Figure 4. Noise level measurements were taken using a Larson-Davis Laboratories Model 700 Type 2 Integrating Sound Level Meter. The noise measurement results are expressed in terms of the 90-Percentile Exceedence Sound Level, L90, which represents a measure of the residual or background noise minimally influenced by nearby discrete events. A brief description of statistical noise levels commonly used to describe environmental noise is presented in Appendix A.
- 4.2 Project Site - The proposed project site, which is currently planted in sugarcane, experiences relatively low noise levels. The existing ambient noise level (L90) is approximately 48 to 55 dBA within the project site, which is typical of rural areas. Presently, the dominant noise sources include wind, traffic and occasional distant aircraft flyovers. An additional potential noise source within the project site is from sugarcane operations, however, no sugarcane operations were experienced during the field measurements.
- 4.3 Project Vicinity - The sugarcane fields surrounding the project site experience an acoustical environment similar to the project site with wind, traffic, and occasional distant aircraft being the dominant noise sources. Presently, the nearest residential area is the Ewa Villages south of the project site. The Ewa Villages experiences an ambient noise level (L90) of approximately 47 to 50 dBA.

5.0 POTENTIAL NOISE IMPACT DUE TO PROJECT

5.1 Additional Traffic Generated by the Project - Measured traffic noise levels and predicted traffic volumes [Reference 7] were used in conjunction with the Federal Highway Administration (FHWA) Traffic Noise Prediction Model [Reference 8] to estimate the traffic noise increase as a result of the project. The traffic noise increase along Farrington Highway was predicted. The projected future (2005 and 2011) traffic noise level increases during peak traffic hours are summarized in Table 5.1.

TABLE 5.1
Projected Future (2005 and 2011) Traffic Noise Level
Leq or Ldn (dBA) Increases During Peak Traffic Hours
Along Farrington Highway

	Without Project	With Project	Due to Project
Future 2005 Traffic Noise Level Increase (dBA)			
AM	4.2	4.7	0.5
PM	3.4	4.1	0.7
Future 2011 Traffic Noise Level Increase (dBA)			
AM	4.7	4.7	0.0
PM	4.1	6.6	2.5

The predicted traffic noise level increases along Farrington Highway due to additional traffic generated by the project were less than or equal to 2.5 dB. Therefore, the traffic noise level increase due to project generated traffic may be perceptible by some people at noise sensitive locations along Farrington Highway.

5.3 Construction Noise - Development of the project will involve excavation, grading, and the construction of infrastructure and buildings. The various construction phases of the project may generate significant amounts of noise, which may impact the nearby residential areas south of the project site. The actual noise is dependent upon the methods employed during each stage of the construction process. Typical ranges of construction equipment noise are shown in Figure 5. Earthmoving equipment, such as bulldozers and diesel-powered trucks, will probably be the loudest equipment used during construction.

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In cases where construction noise exceeds, or is expected to exceed, the DOH's "allowable" property line limits, a permit must be obtained from the DOH to allow the operation of vehicles, construction equipment, power tools, etc. which emit noise levels in excess of the "allowable" limits. Required permit conditions for construction activities are:

"No permit shall allow construction activities creating excessive noise...before 7:00 am and after 6:00 pm of the same day."

"No permit shall allow construction activities which emit noise in excess of ninety-five dB(A)...except between 9:00 am and 5:30 pm of the same day."

"No permit shall allow construction activities which exceed the allowable noise levels on Sundays and on...[certain] holidays. Activities exceeding ninety-five dB(A) shall [also] be prohibited on Saturdays."

In addition, construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must be equipped with mufflers. Also, construction vehicles using traffic-ways must satisfy the DOH's vehicular noise requirements [Reference 9].

Blasting, if required, could also produce noise impacts. However, blasting at construction sites near populated areas is usually accomplished by using numerous small charges detonated with small time delays. Blast mats can also be used to assist in directing the explosive energy into the rock, controlling flying debris, and muffling the noise. Thus, with the appropriate blast design techniques, the noise from blasting can be controlled within acceptable limits at the closest noise sensitive locations.

6.0 POTENTIAL NOISE IMPACT ON THE PROJECT

- 6.1 Aircraft - The proposed project site is within approximately four to eight miles of Honolulu International Airport (including Hickam AFB) (HIA) and Barbers Point Naval Air Station (BPNAS). Due to the distance from the project site, the overall day-night average sound level, Ldn, due to air traffic associated with HIA and BPNAS will be less than 55 dBA at the project site [References 10 and 11], which is compatible with the State DOT residential guidelines. However, due to the vicinity of the project site to flight tracks associated with HIA and BPNAS infrequent aircraft flyovers may, at times, be audible at the project site. As shown in Figures 6 and 7, the project site is approximately 1.5 miles from HIA arrival flight track 17 & 18 & 20 and departure track 16 which conducts an average of approximately 120 general aviation aircraft

operations per day (daytime only) [Reference 10]. As shown in Figure 8, the project site is near BPNAS flight track 22RHA1/04D1 which conducts an average of approximately 10 helicopter operations per day (daytime and nighttime) [Reference 11]. Although these aircraft flyovers may, at times, be audible, aircraft noise should not significantly impact the proposed development.

- 6.2 Traffic Noise - The proposed plan for traffic circulation within the project site is shown in Figure 9. The proposed residential areas within the project site will potentially be impacted by traffic noise. The Federal Highway Administration (FHWA) Traffic Noise Prediction Model has been used along with traffic data provided in the referenced traffic study to predict future traffic noise levels along Farrington Highway, North-South Road, and interior arterials. Traffic noise was predicted at the locations shown in Figure 9.

Future traffic noise levels along Farrington Highway were based on the predicted peak hour traffic volumes with a 2.5% medium truck and 1.5% heavy truck mix, a 35 mph posted speed limit, and a future expansion to a four-lane roadway. The day-night average sound levels, Ldn, were estimated from the peak hour equivalent-continuous noise levels, Leq, as specified by HUD [Reference 5]. Results at Location A indicate that residences less than approximately 74 ft from the centerline of the right-of-way (ROW) will be exposed to Ldn levels between 75 and 70 dBA (HUD "Normally Unacceptable" Site), and residences between approximately 74 and 219 ft from the centerline will be exposed to Ldn levels between 70 and 65 dBA (HUD "Normally Unacceptable" Site). These distances are based on a four-lane roadway without a median or center island between the directional traffic. If the four-lane roadway will include a median, this analysis would require updating to account for the increased distance between the directional traffic. Similar results at Location B indicate that residences less than approximately 104 ft from the centerline will be exposed to Ldn levels between 75 and 70 dBA, and residences between approximately 104 ft and 299 ft from the centerline will be exposed to Ldn levels between 70 and 65 dBA. These results are summarized in Table 6.1 with respect to HUD criteria.

The project is bordered on the west by the proposed North-South Road. Future traffic noise levels along North-South Road were based on the predicted peak hour traffic volumes with a 2.5% medium truck and 1.5% heavy truck mix, a 35 mph posted speed limit, and a four-lane roadway. Results at Locations D and E are also summarized in Table 6.1.

Future traffic noise levels along the interior arterials were based on the predicted peak hour traffic volumes with a 2.5% medium truck and 0.5% heavy truck mix, a 25 mph posted speed limit, and a four-lane roadway. Results indicate that residences along the interior arterials should be exposed to Ldn levels less than 65 dBA (HUD "Acceptable" Site).

The minimum setbacks listed in Table 6.1 are worst cases and detailed analysis of specific building projects may allow smaller setbacks. For example, if the roadway is elevated above future housing, a barrier may effectively shield windows in second-floor units allowing substantially less setback if optimum planning, grading, and design are incorporated.

Table 6.1

Estimated minimum setback distances* for multi-story, naturally ventilated residences required by HUD traffic noise criteria

Location	Roadway	HUD "Acceptable" Site	HUD "Normally Unacceptable" Site	HUD "Unacceptable" Site
		Ldn < 65	Ldn 65-70	Ldn >75
A	Farrington Hwy	>219'	219 to 74'	74' to ROW
B	Farrington Hwy	>299'	299 to 104'	104' to ROW
D	North-South Rd	>220'	220 to 80'	80' to ROW
E	North-South Rd	>295'	295 to 98'	98' to ROW

*Based on distance from right-of-way (ROW) centerline and 6.5 feet HUD requirement between noise level prediction location and the building setback line.

As previously discussed in Section 3.5, HUD has established Site Acceptability Standards for interior and exterior noise exposure at housing areas. These standards are based on Ldn levels and identify the need for noise abatement. Housing areas exposed to Ldn levels between 65 and 75 dBA require some means of noise abatement, either at the property line or in the building construction in order to meet HUD criteria and, thus, be eligible for potential HUD/FHA financing. Therefore, noise mitigation measures should be implemented to reduce the traffic noise exposure along Farrington Highway and North-South Road. HUD standards for residential developments exposed to Ldn levels between 65 and 70 dBA, require the building construction to provide a minimum of 5 dB attenuation in addition to "attenuation provided by buildings as commonly constructed in the area, and requiring open windows for ventilation". Similarly, HUD standards require a minimum of 10 dB additional attenuation for residential developments exposed to Ldn levels between 70 and 75 dBA.

Mitigation of traffic noise along Farrington Highway and North-South Road would include properly constructing a sound barrier along the roadway, such as a noise barrier wall and/or a landscaped earth berm, which clearly blocks the line-of-sight to the traffic. While a noise barrier along the roadway may provide adequate traffic noise attenuation at the first level of naturally ventilated residences, it may be impractical to construct a barrier tall enough to afford noise reduction at

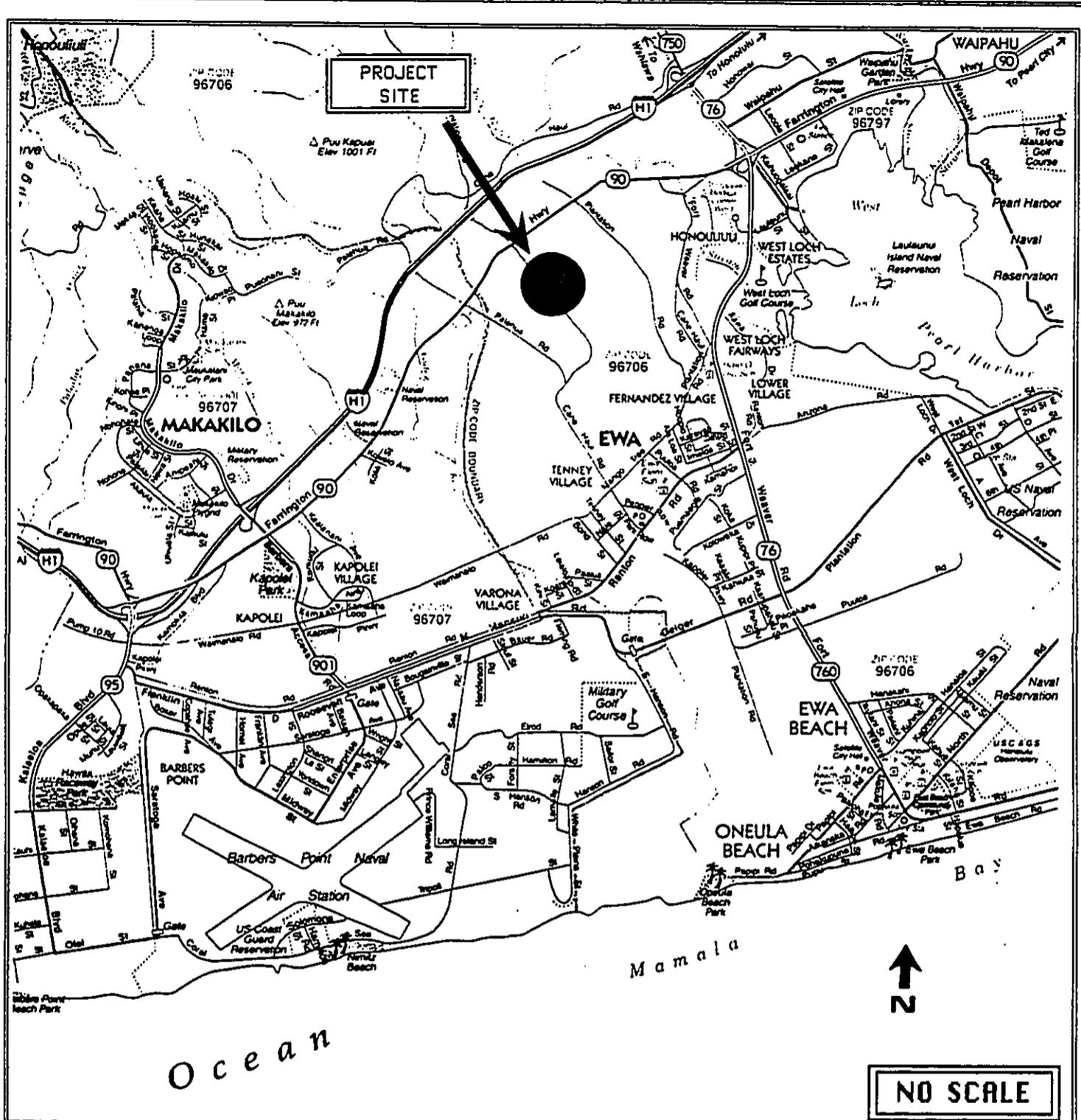
the upper levels of multi-story residences. Therefore, by HUD requirements, the upper-level units of the apartment buildings exposed to Ldn levels between 70 and 75 dBA, must provide an additional 10 dB interior attenuation. However, an additional 10 dB room attenuation is somewhat difficult to achieve with sound absorptive materials commonly used in noise sensitive living spaces. Therefore, the upper-level of the residences within the 70 to 75 Ldn zone should be air-conditioned to allow closed windows for noise reduction purposes. Similarly, by HUD requirements, the residences exposed to Ldn levels between 65 and 70 dBA, must provide an additional 5 dB room attenuation. Additional room attenuation is commonly achieved in naturally ventilated living spaces, such as bedrooms, by installing carpeting (with pad), louvered closet doors, and absorptive ceiling tiles (as opposed to the standard hard tile floors, solid-faced closet doors, and hard-surface ceilings, respectively).

- 6.3 Sugarcane Agriculture - Sugarcane agriculture involves activities such as land preparation, harvesting, hauling, etc., which are characterized by periods of intense activity with equipment operating 24 hours per day. Lands both west and east of the proposed project site are currently sugarcane. If nearby sugarcane operations continue beyond the completion of the proposed project, noise from agriculture activities may impact nearby noise sensitive residential areas.

DRAFT

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3. *Study Recommendations for Local Land Use Compatibility with Yearly Day-Night Average Sound Levels*, State Department of Transportation, Airports Division, Received August 1991, published in Reference 10.
4. *Department of Transportation, Federal Highway Administration Procedures for Abatement of Highway Traffic Noise*, Title 23, CFR, Chapter 1, Subchapter J, Part 772, 38 FR 15953, June 19, 1973, Revised at 47 FR 29654, July 8, 1982.
5. *HUD Environment Criteria and Standards*, 24 CFR 51, Federal Register, Volume 44, No. 135, July 12, 1979; Amended 49 FR 880, January 6, 1984.
6. *Toward a National Strategy for Noise Control*, U.S. Environmental Protection Agency, April 1977.
7. *2005 and 2011 Traffic Forecasts*, Schuler-Ewa Development, Pacific Planning & Engineering, Inc., August 25, 1994.
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10. *Honolulu International Airport Master Plan Update & Noise Compatibility Program*, State of Hawaii Department of Transportation, Airports Division, Vol. 2, October 1989.
11. *Naval Air Station Barbers Point Air Installations Compatible Use Zones (AICUZ) Noise Contours and Supporting Data*, Naval Facilities Engineering Command, Alexandria, VA, July, 1989.



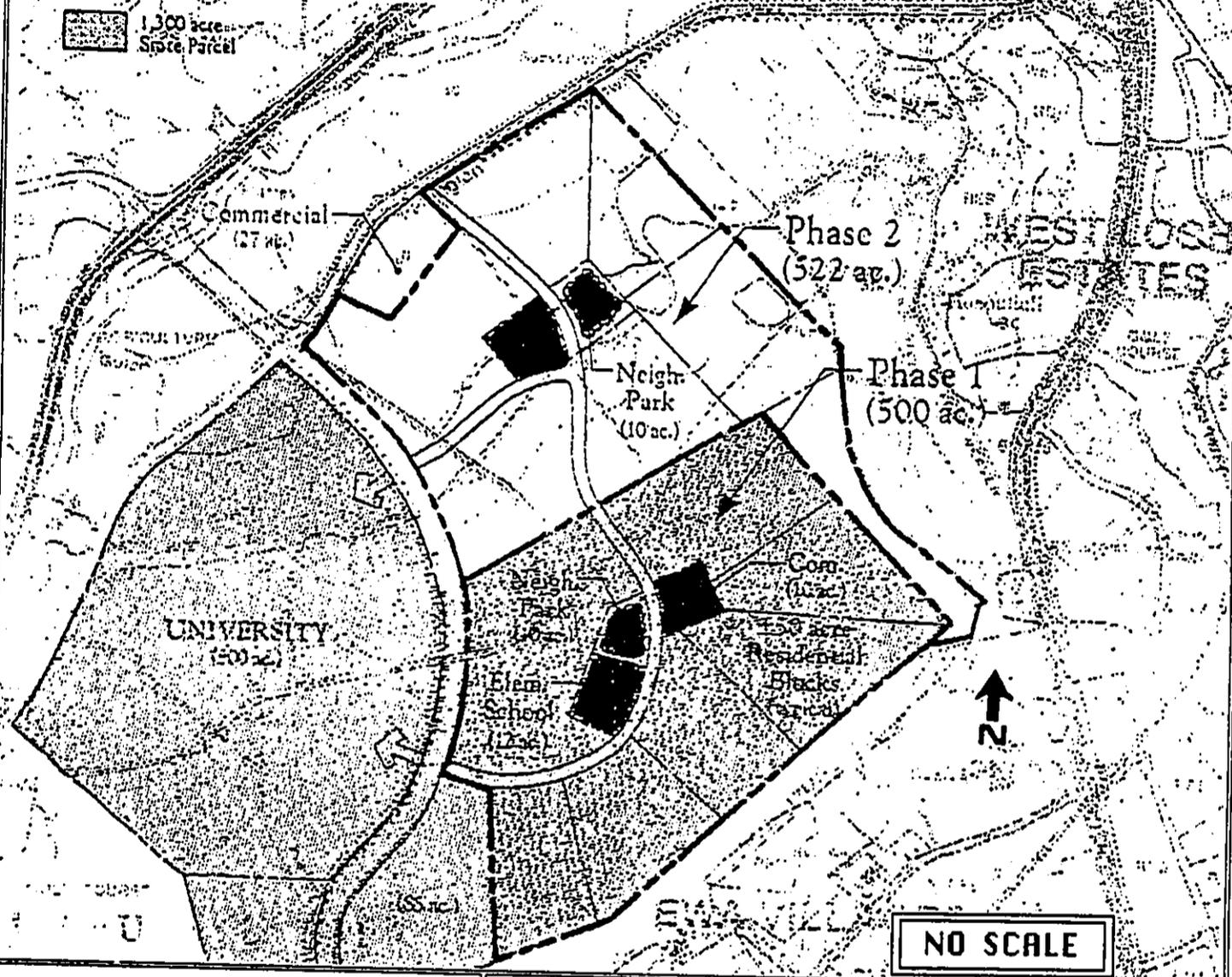
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FIGURE 1 - PROJECT SITE AND VICINITY

Land Use Summary (Acres)			
Land Use	Phase 1	Phase 2	Total
Residential	458	490	826
Commercial	10	10	20
School	12	0	12
Parks	10	10	20
Circulation	10	12	22
Total	500	522	1,022

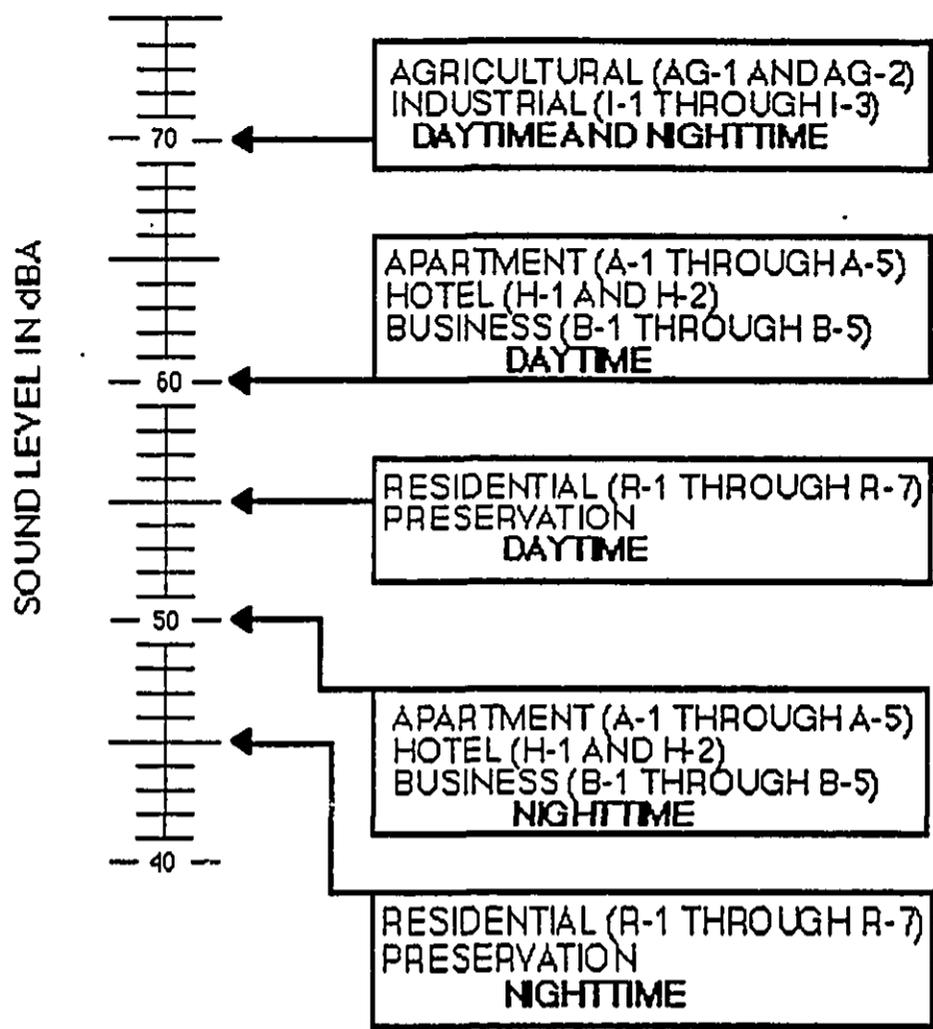
1,300 acre Site Parcel



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FIGURE 2 - SCHULER-EWA DEVELOPMENT PLAN

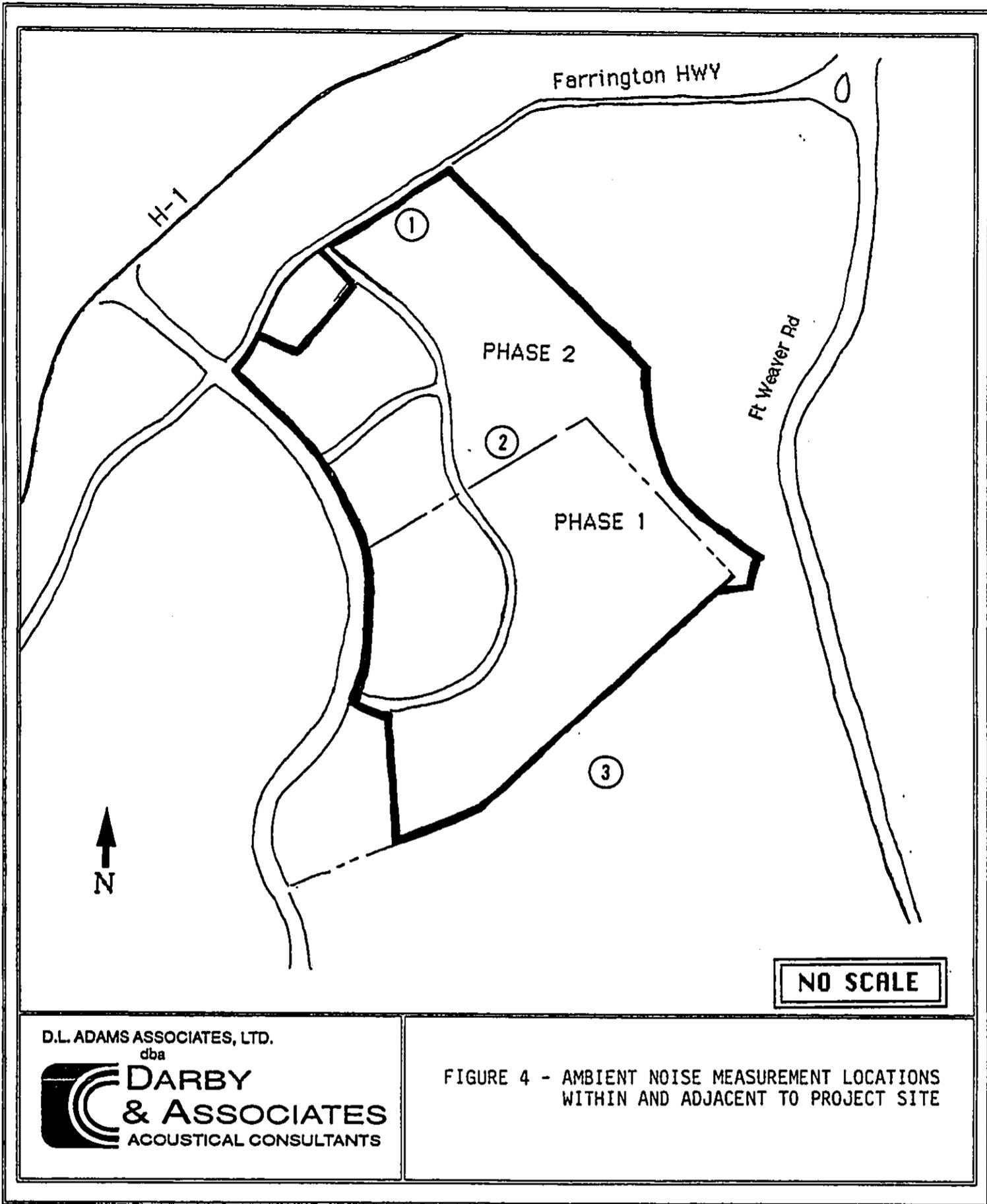


NOTE: LEVELS INDICATED BY ZONING DISTRICT ARE THE "ALLOWABLE" LEVELS THAT SHALL NOT BE EXCEEDED FOR MORE THAN TEN PERCENT OF THE TIME WITHIN ANY TWENTY MINUTE PERIOD DURING THE TIME PERIOD SHOWN (DAYTIME: 7:00 A.M. TO 10:00 P.M., NIGHTTIME: 10:00 P.M. TO 7:00 A.M.)

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FIGURE 3 - ALLOWABLE NOISE LEVELS FOR VARIOUS ZONING DISTRICTS (COMMUNITY NOISE CONTROL FOR OAHU, STATE OF HAWAII DEPARTMENT OF HEALTH)

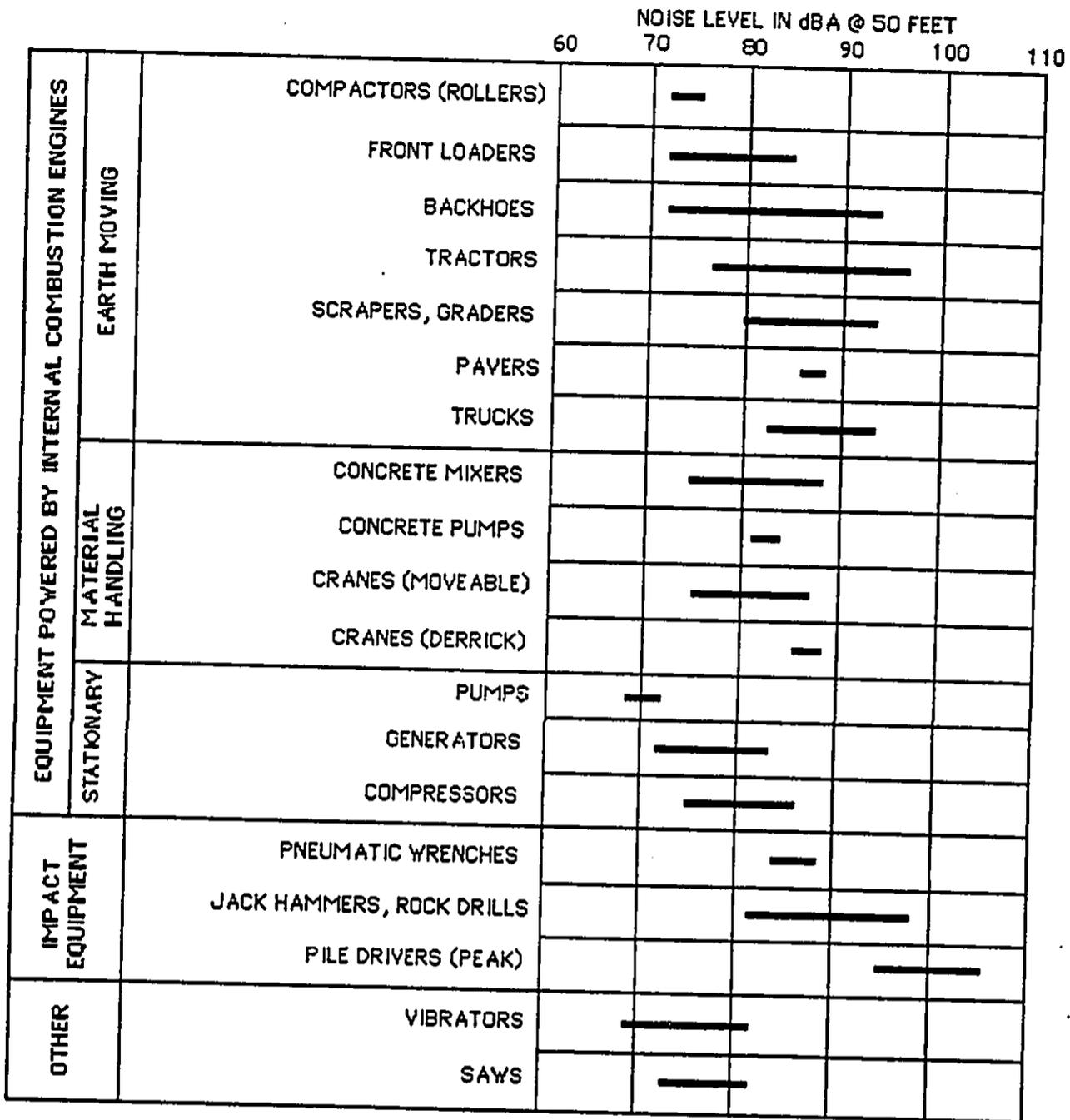


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FIGURE 4 - AMBIENT NOISE MEASUREMENT LOCATIONS
WITHIN AND ADJACENT TO PROJECT SITE

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



NOTE: BASED ON AVAILABLE DATA SAMPLES

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FIGURE 5 - TYPICAL SOUND PRESSURE LEVELS FROM CONSTRUCTION EQUIPMENT

SOURCE: U.S. ENVIRONMENTAL PROTECTION AGENCY 1972

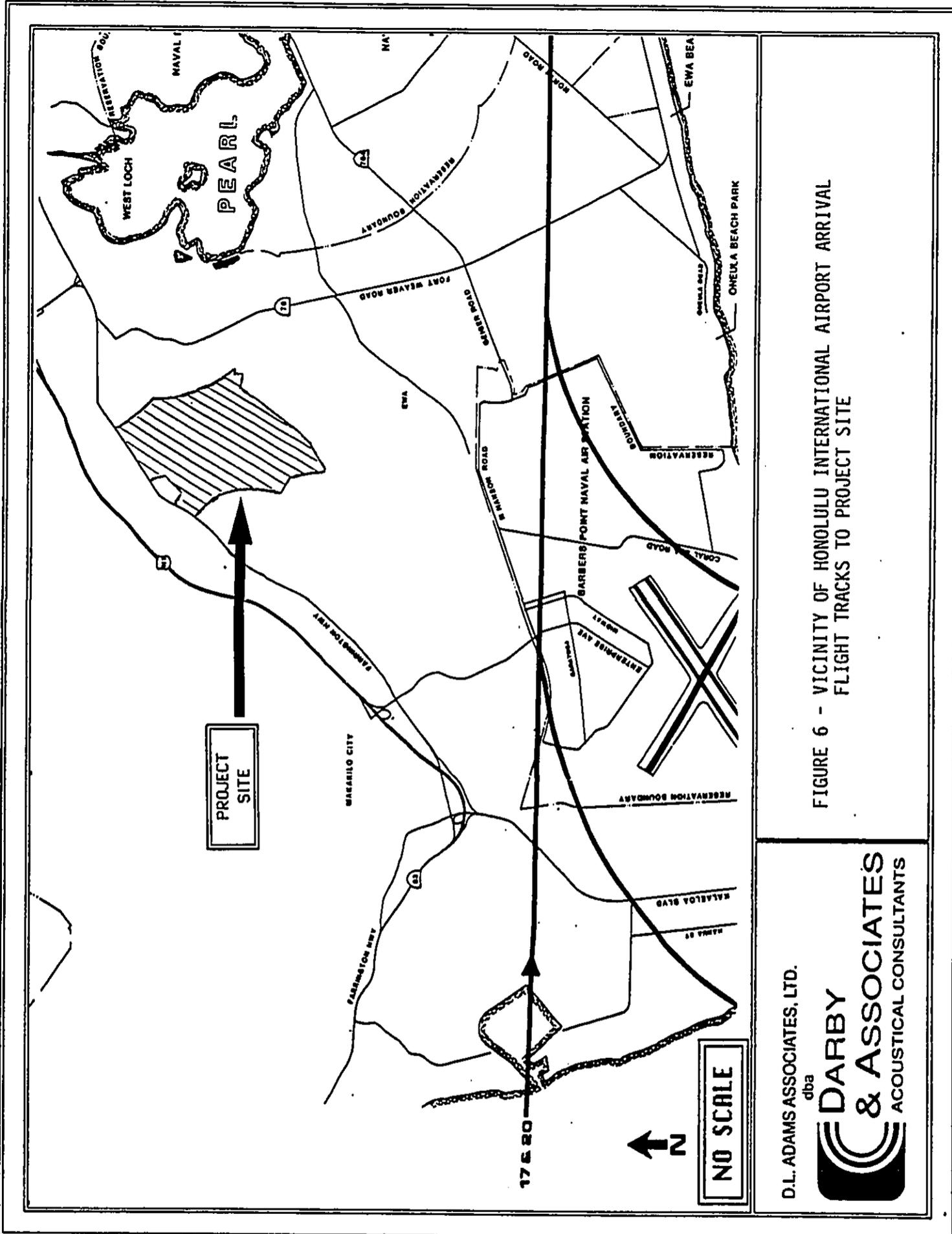


FIGURE 6 - VICINITY OF HONOLULU INTERNATIONAL AIRPORT ARRIVAL FLIGHT TRACKS TO PROJECT SITE

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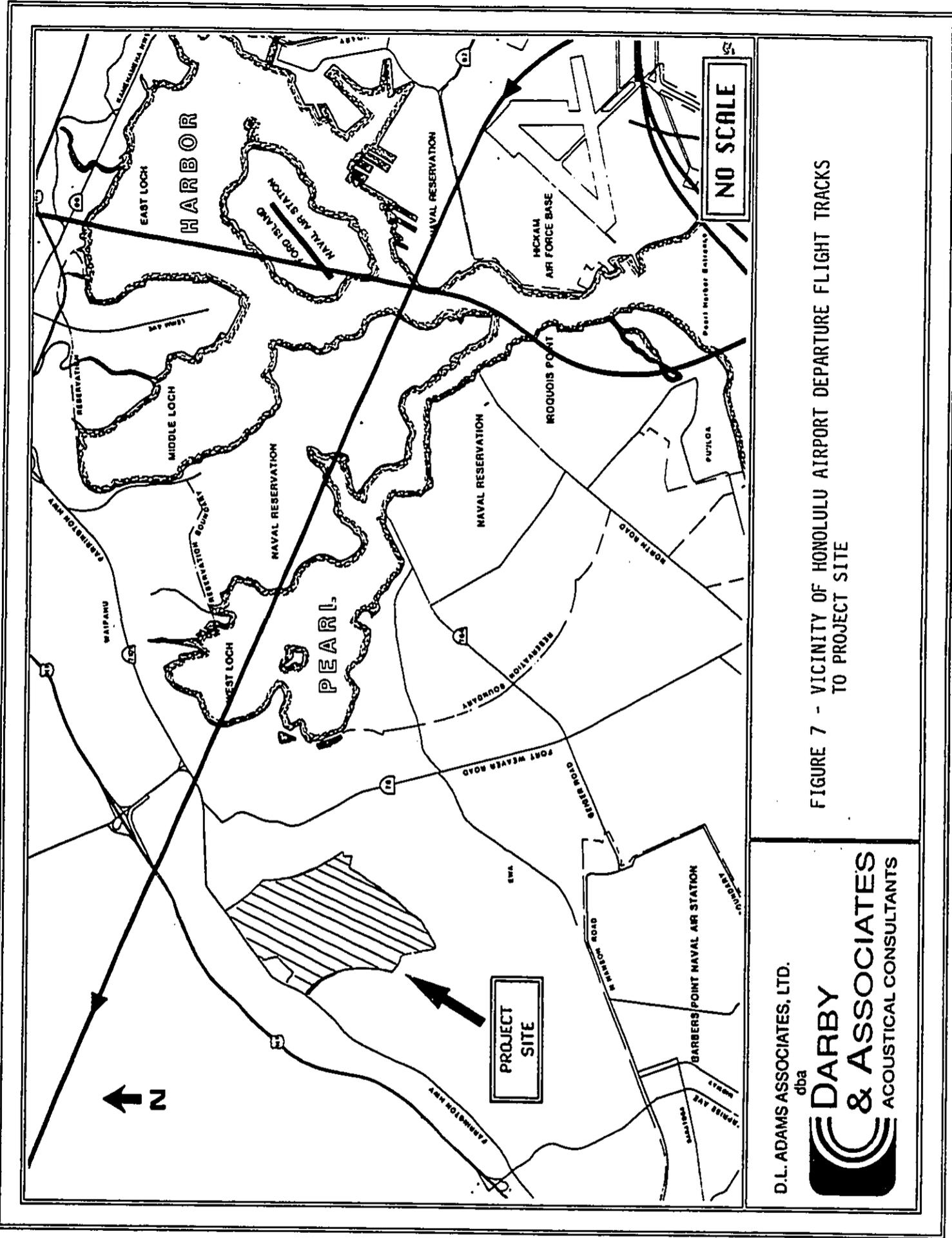


FIGURE 7 - VICINITY OF HONOLULU AIRPORT DEPARTURE FLIGHT TRACKS TO PROJECT SITE

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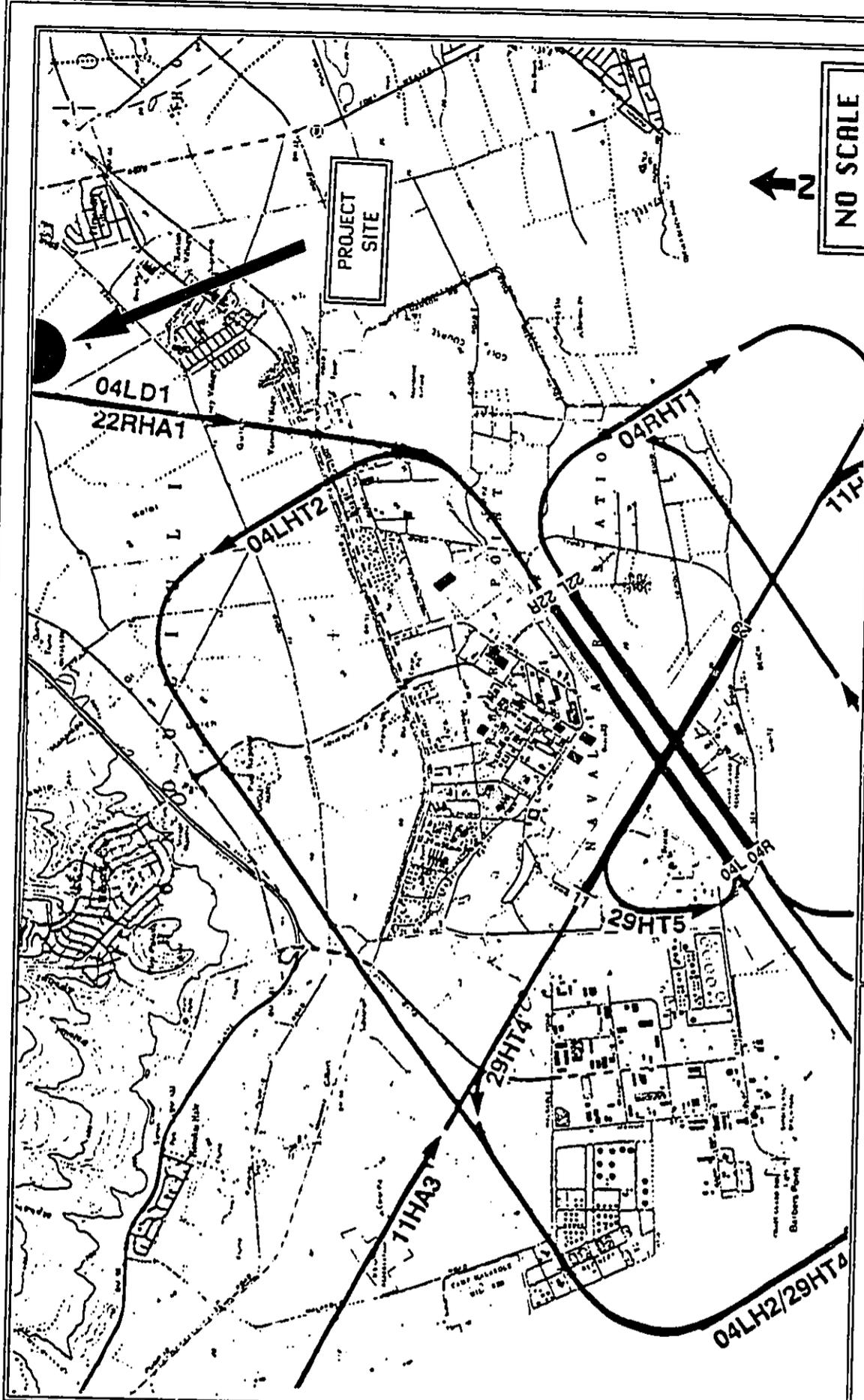


FIGURE 8 - VICINITY OF BARBERS POINT NAS HELICOPTER FLIGHT TRACK TO PROJECT SITE

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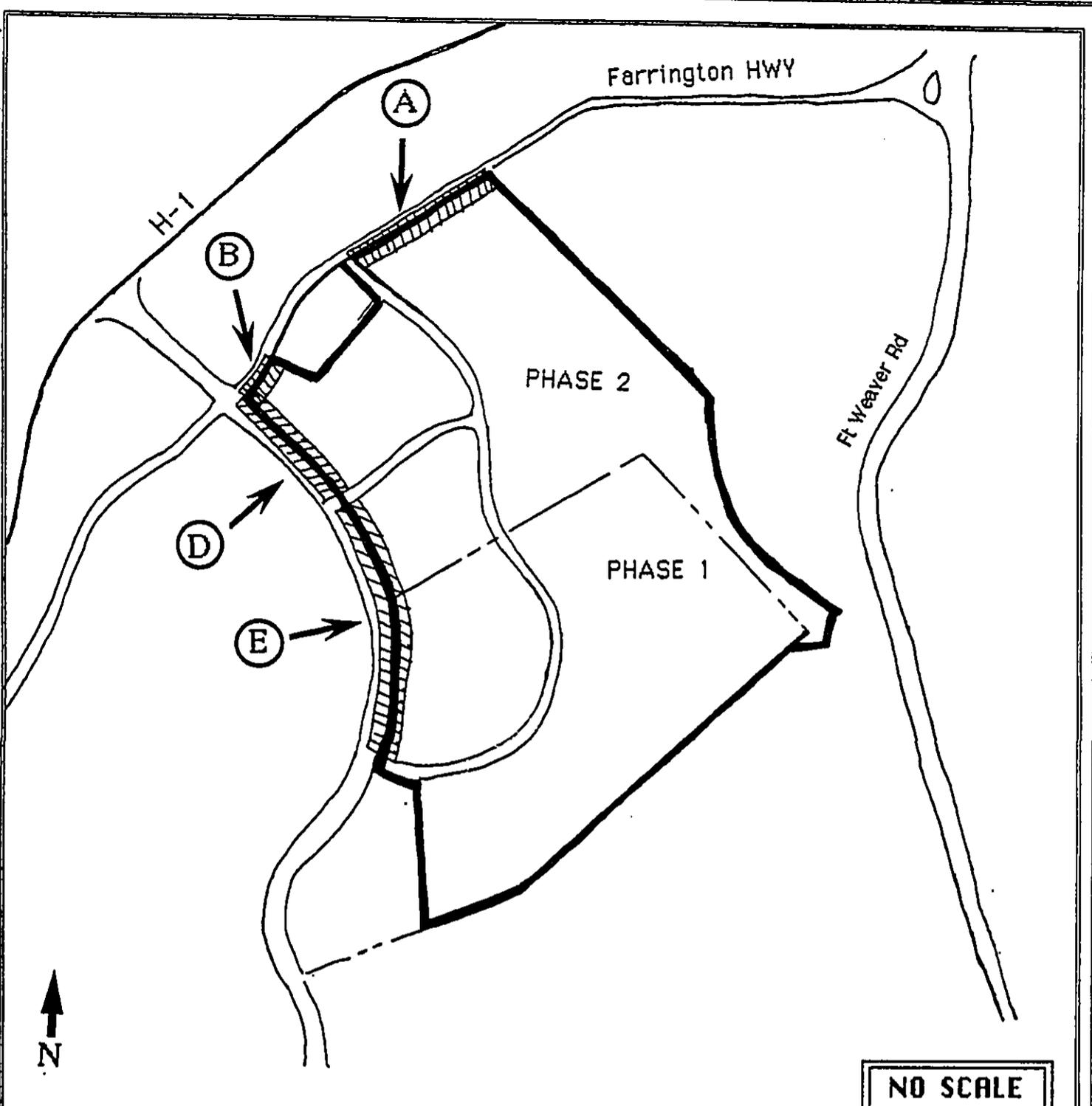
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FIGURE 9 - TRAFFIC NOISE ASSESSMENT LOCATIONS

APPENDIX A
ACOUSTICAL TERMINOLOGY

Sound (Noise) Level

Sound or noise consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. It is measured in terms of decibels (dB) using precision instruments known as sound level meters.

Sound Level or Sound Pressure Level is defined as:

$$\text{SPL} = 20 \log (P/P_{\text{ref}}) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and P_{ref} is 20 micropascals, which is approximately the lowest sound pressure that can be detected by the human ear. For example, if P is 20 micropascals, then $\text{SPL} = 0 \text{ dB}$, or if P is 200 micropascals, then $\text{SPL} = 20 \text{ dB}$. The relation between sound pressure in micropascals and sound pressure level in decibels (dB) is shown in Figure A-1.

The sound level that results from a combination of noise sources is not the sum of the individual sound levels, but rather the logarithmic sum. For example, two sound levels of 50 dB produce a combined level of 53 dB, not 100 dB; two sound levels of 40 and 50 dB produce a combined level of 50.4 dB.

Human sensitivity to changes in sound level is highly individualized. Sensitivity to sound depends on frequency content, time of occurrence, duration, and psychological factors such as emotion and expectations. However, in general, a change of 1 or 2 dB in the level of a sound is difficult for most people to detect, a 3 to 5 dB change corresponds to a small but noticeable change in loudness, and a 10 dB change corresponds to an approximate doubling or halving in loudness.

A-Weighted Sound Level

The human ear is more sensitive to sound with frequencies above 1000 Hertz (Hz), than with frequencies below 125 Hz. Due to this type of frequency response, a weighting system, A-weight, was developed to approximate the frequency response of the human ear. A-weighted sound level (dBA) de-emphasizes the low frequency portion of the spectrum of a signal. The A-weighted (dBA) level of a sound is a good measure of the loudness of that sound, and so different sounds having the same A-weighted level sound about equally as loud. Typical values of the A-weighted sound level of various noise sources are listed in Figure A-1.

Appendix A
Acoustical Terminology
(Continued)

Statistical Sound (Noise) Levels

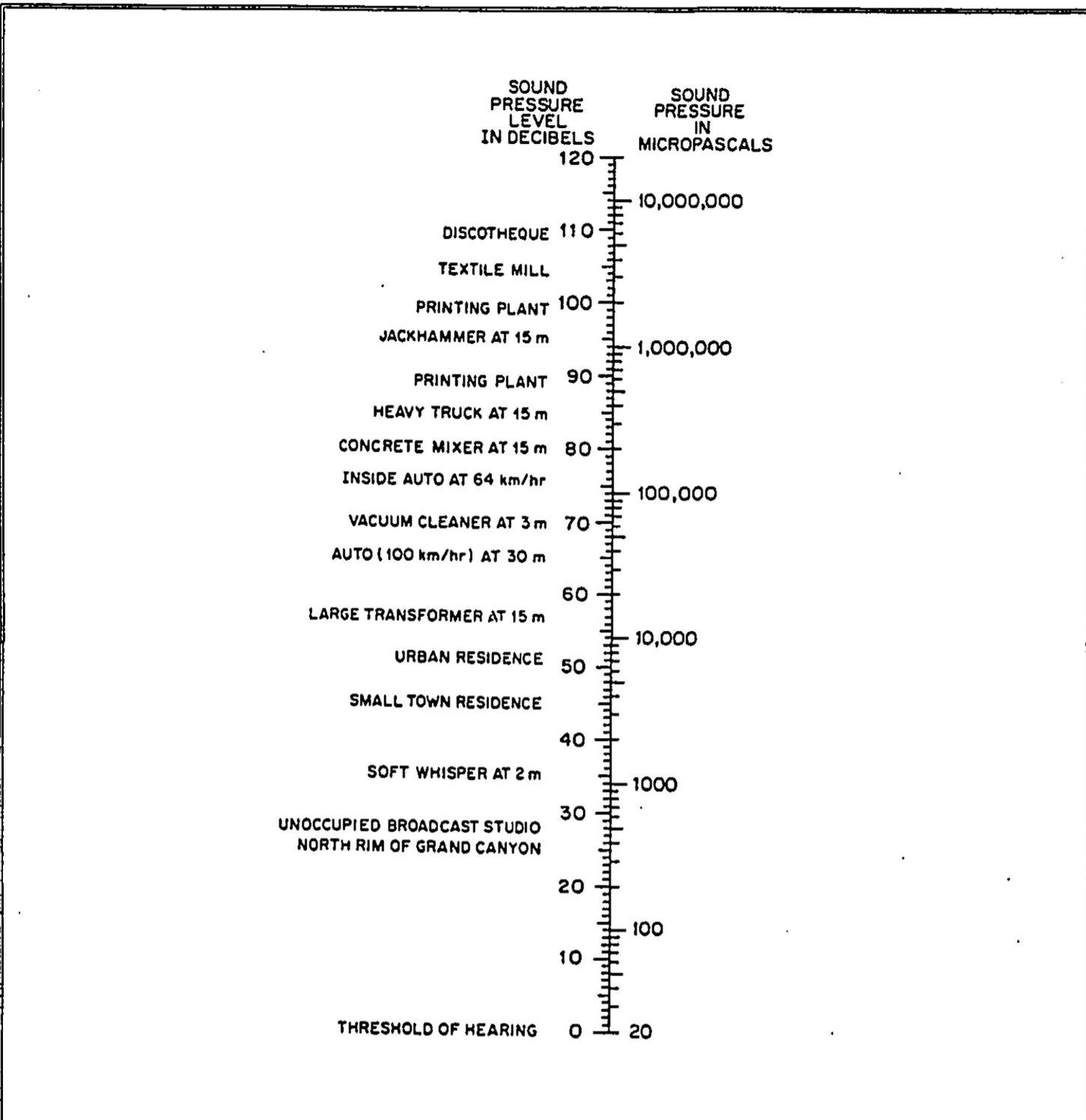
The sound levels of long-term noise producing activities, such as traffic movement, aircraft operations, etc., can vary considerably with time. In order to obtain a single number rating of such a noise source, several statistical noise levels have been developed and instrumentation are available to measure them. Common statistical sound levels include Equivalent Continuous Noise Level, L_{eq} , and Percentile Exceedence Level, L_x .

The Equivalent Continuous Noise Level, L_{eq} , represents a constant level with the same amount of total acoustic energy as that contained in the actual time-varying sound being measured over a specific time period. L_{eq} is commonly used to describe community noise, traffic noise, and hearing damage potential.

A Percentile Exceedence Level, L_x , represents the sound level which is exceeded for x% of the measured time period. For example, $L_{10} = 60$ dBA describes that over the measured time period, the measured noise exceeded 60 dBA for 10% of the time. Common Percentile Exceedence Levels include L_1 , L_{10} , L_{50} , and L_{90} , which are widely used to assess community and environmental noise. Figure A-2 illustrates the relationship between selected statistical noise levels.

Day Night Average Sound Level

The Day Night Average Sound Level, L_{dn} , is essentially the Equivalent Continuous Noise Level measured over a 24-hour period. However, in calculating the L_{dn} , 10 dBA is added to the noise levels recorded between 10 pm and 7 am to account for people's higher sensitivity to noise at night. The L_{dn} is a commonly used noise descriptor in assessing land use compatibility, and is used by federal and local agencies and standards organizations. Qualitative descriptions, as well as local examples of L_{dn} , are shown in Figure A-3.

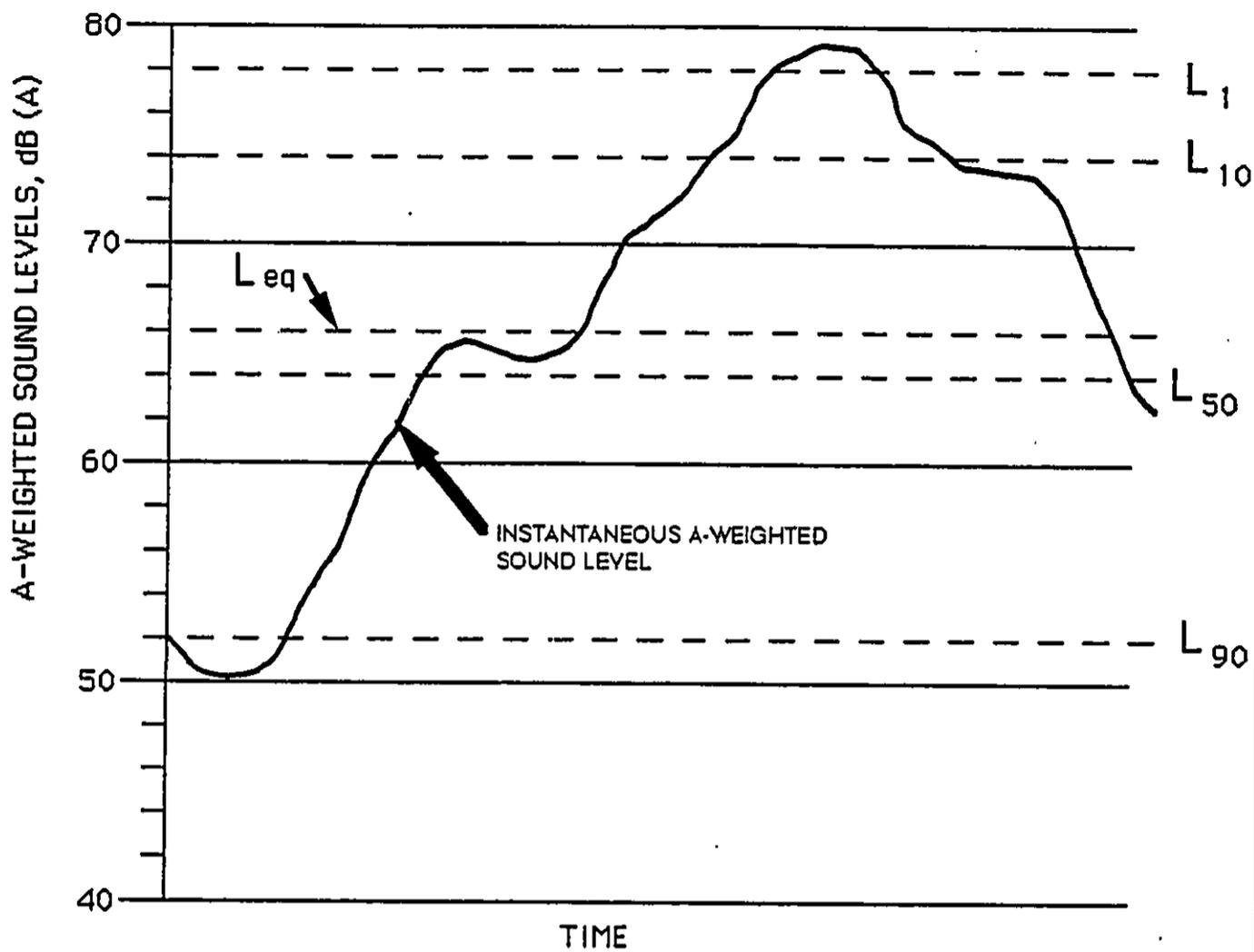


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FIGURE A-1 THE RELATION BETWEEN SOUND PRESSURE, P, AND SOUND PRESSURE LEVEL, SPL. ALSO SHOWN ARE TYPICAL VALUES OF A-WEIGHTED SOUND LEVELS OF VARIOUS NOISE SOURCES.

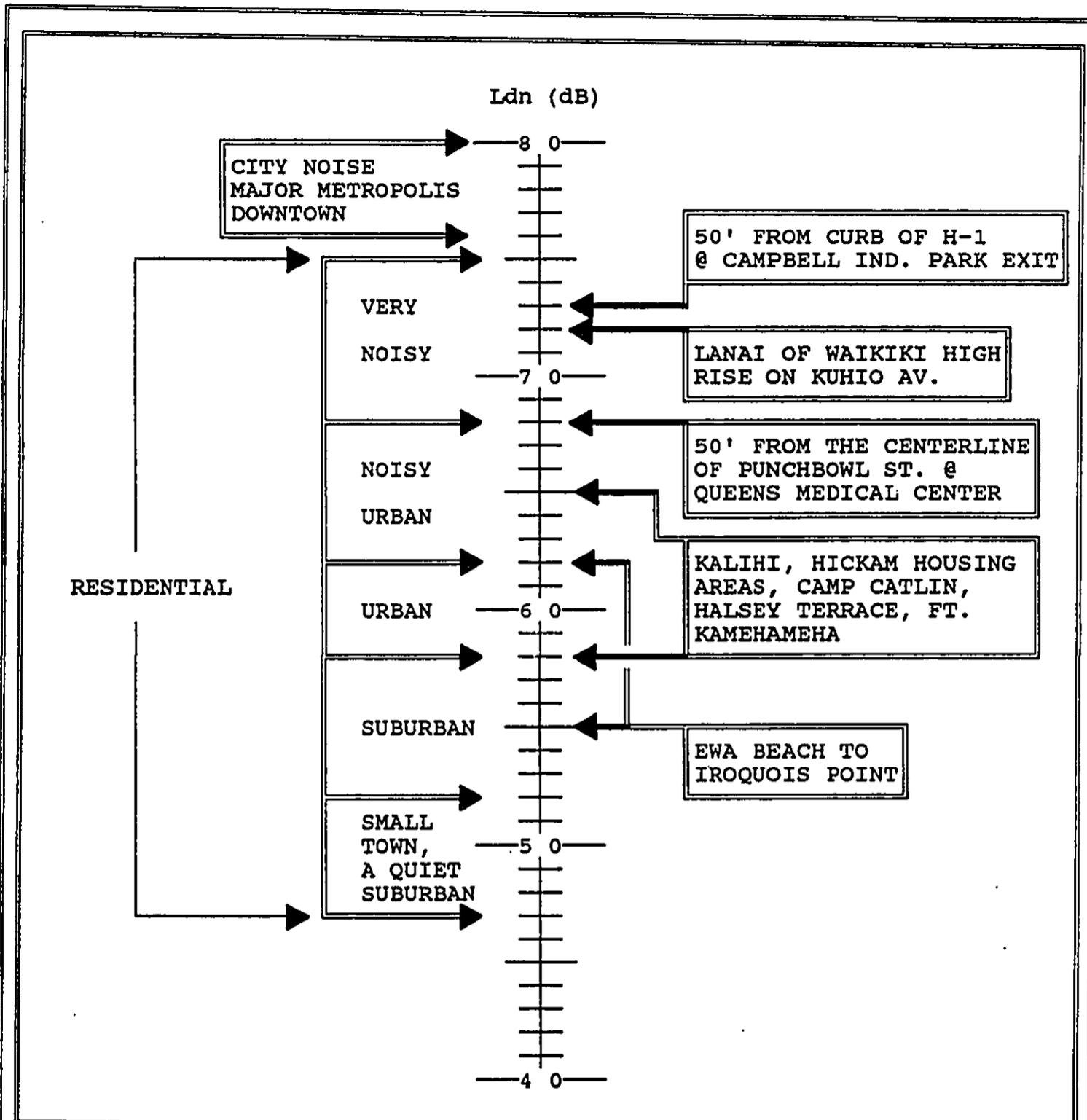
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FIGURE A-2 COMPARISON OF AN INSTANTANEOUS
SOUND LEVEL AND THE CORRESPONDING
STATISTICAL SOUND LEVELS



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FIGURE A-3

QUALITATIVE DESCRIPTION OF THE DAY-NIGHT SOUND LEVELS (Ldn) AND EXAMPLE Ldn's AT SELECTED LOCATIONS ON OAHU

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Appendix G

East Kapolei Project: Impact on Agriculture
Decision Analysts Hawaii, Inc., September 1994

EAST KAPOLEI PROJECT:
Impact on Agriculture

EAST KAPOLEI PROJECT:
Impact on Agriculture

PREPARED FOR:
Schuler Homes, Inc.

PREPARED BY:
Decision Analysts Hawaii, Inc.

September 1994

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EXECUTIVE SUMMARY

The East Kapolei Project (the "Project") is a proposed 1,022-acre residential community that will be developed in the central portion of the Ewa Plain by Schuler Homes, Inc. Summarized below are the impacts on agriculture that will result from developing the Project.

AGRONOMIC CONDITIONS

Assuming typical land rents for agriculture, nearly the entire Project area would be good for crop production. In fact, the lands would be among the best in the State for growing a variety of crops inasmuch as the area offers excellent agronomic conditions and is in a highly desirable location.

IMPACT ON SUGARCANE OPERATIONS

The property is leased to Oahu Sugar Co., Ltd. (OSCo) until mid-1995, specifically for the cultivation of sugarcane. However, Amfac/JMB Hawaii (Amfac) has announced that it will close this unprofitable plantation in 1995 after the final harvest.

Inasmuch as OSCo is closing for reasons unrelated to the proposed development, and will close before development is scheduled to begin, the Project will have no impact on sugar operations.

IMPACT ON PINEAPPLE OPERATIONS

The Project will be developed in two phases of 500 acres and 522 acres. The land for Phase I was obtained through an exchange with the State of Hawaii; for its part, the State received about 2,000 acres of land north of Wahiawa in the Poamoho area.

Poamoho has high-quality pineapple fields cultivated by Del Monte Fresh Produce (Hawaii) Inc. ("Del Monte"). In 1993, a residential community was proposed on nearly 900 acres of Poamoho land. This project would have required Del Monte to secure replacement fields, most likely on lands in Kunia that are being released from sugarcane cultivation by OSCo. Furthermore, Del Monte would have had to expend about \$700,000 to reconfigure the fields and modify the irrigation system for pineapple cultivation, and would have had to change its planting schedule throughout its plantation to adjust to the fact that Poamoho fields produce summer fruit while Kunia lands produce winter fruit.

The Ewa/Poamoho land exchange was made in order to retain the Poamoho lands in agriculture while using other lands for much-needed housing. Consequently, the proposed Project and the underlying land exchange avoids the adverse impact that would have occurred had the original development proceeded at Poamoho. Del Monte will be able to continue to grow pineapple on the excellent Poamoho fields, thereby avoiding the cost and disruption of relocating a major portion of its farm operation from Poamoho to Kunia.

INTERIM DIVERSIFIED-AGRICULTURE USE

As mentioned above, Phase I consists of 500 acres of land which was obtained from the State. Until construction begins, the State will make this land, or remaining undeveloped portions of it, available to farmers under short-term leases to grow seed corn and other diversified crops.

As noted below, however, an excess supply of agricultural land exists Statewide and on Oahu. Consequently, the temporary availability of the Project land for diversified crops is not expected to significantly affect the amount of agricultural activity Statewide or on Oahu. However, it may temporarily affect the location of some operations.

IMPACT ON THE GROWTH OF DIVERSIFIED AGRICULTURE

Ample prime agricultural land will be available to easily accommodate requirements of diversified agriculture Statewide and on Oahu. This conclusion derives from

the following: (1) a vast amount of prime agricultural land and water is available, having been freed from sugar and pineapple production in recent years; (2) additional sugarcane acreage and water will be freed within the next few years; (3) some, if not most, of the sugar companies are willing to make their lands available for profitable replacement crops to the extent that such crops exist; and, in contrast, (4) land requirements for diversified agriculture are surprisingly modest.

As the above indicates, the limiting factor to the growth of diversified agriculture will *not* be the *land supply*, but rather the *size of the market* for those crops that can be grown profitably in Hawaii. The proposed East Kapolei Project involves far too little land to affect this conclusion, and will therefore not affect adversely the Statewide or Oahu growth of diversified agriculture.

EAST KAPOLEI PROJECT: Impact on Agriculture

INTRODUCTION

The East Kapolei Project (referred to as "the Project" in this report) is a proposed 1,022-acre residential community to be located in the middle of the Ewa Plain, south of both the H-1 Freeway and Farrington Highway, west of Fort Weaver Road, north of Ewa Villages, and east of the Village of Kapolei. The Project is to be developed by Schuler Homes, Inc. in two phases: Phase I, consisting of 500 acres obtained through a land exchange with the State of Hawaii, and Phase II, consisting of 522 acres purchased from The Estate of James Campbell. Sales are scheduled to begin in 1997 and continue through 2011.

This report addresses the impacts on agriculture that will result from developing the Project.

AGRONOMIC CONDITIONS

Soil Types⁽¹⁾

The land within the Project area consists of seven soil types:

- | | |
|-----|---|
| EaB | Ewa silty clay loam, 3 to 6% slopes; |
| HxA | Honouliuli clay, 0 to 2% slopes; |
| HxB | Honouliuli clay, 2 to 6% slopes; |
| KyA | Kunia silty clay, 0 to 3% slopes; |
| WkA | Waialua silty clay, 0 to 3% slopes; |
| WzA | Waipahu silty clay, 0 to 2% slopes; and |
| WzB | Waipahu silty clay, 2 to 6% slopes. |

For each soil type, Table 1 shows the approximate acreage in both phases, the possible agricultural uses, and two soil ratings (explained below). The predominate soil types are HxA (616 acres, or 60% of the Project area), KyA (216 acres, or 21%), WzA (98 acres, or 10%), and WzB (73 acres, or 7%).

Soil Characteristics

The Project area has soils which have moderate-to-good machine tillability, are not stony, are more than 30 inches deep, are level or gently sloping, and are either moderately well-drained or well-drained.^[2]

Table 1.— EAST KAPOLEI PROJECT: SOIL TYPES, ACREAGES, AGRICULTURAL USES, AND SOIL RATINGS

Soil Type	Acres		Agricultural Uses	SCS Rating ¹	LESA Rating
	Phase I	Phase II			
EaB	0	1	Sugarcane, truck crops, pasture	IIe	85
HxA	446	170	Sugarcane, truck crops, pasture	I	87
HxB	0	4	Sugarcane, truck crops, pasture	IIe	85
KyA	5	211	Sugarcane, pineapple ²	I	95
WkA	0	3	Truck crops, pasture	I	93
WzA	30	68	Sugarcane	I	92
WzB	17	56	Sugarcane	IIe	90
Reservoirs	<u>2</u>	<u>9</u>			
TOTAL	500	522		—	—

1. Assuming irrigation.

2. As discussed in the text, the Project is at too low of an elevation and temperatures are too warm for pineapple production.

Soil Ratings

The soils within the Project area have been rated in terms of four classification systems commonly used in Hawaii: (1) Land Capability Grouping, (2) Agricultural Lands of Importance to the State of Hawaii, (3) Overall Productivity Rating, and (4) Proposed Land Evaluation and Site Assessment. These classification systems are discussed below and summarized in Figure 1.

- (1) *Land Capability Grouping by the United States Department of Agriculture Soil Conservation Service (SCS).*^[1]

This classification system rates soils according to eight levels, ranging from the highest classification level, I, to the lowest level, VIII. Assuming irrigation, the SCS Rating for each soil type is shown in Table 1.

For each classification, the acreage, percentage of the Project area, and limitations are as follows:

Class I: Class I soils amount to about 481 acres in Phase I and 452 acres in Phase II, for a total of 933 acres. This is about 91% of the entire Project area. Class I soils have few limitations that restrict their use.

Class IIe: Class IIe soils amount to about 17 acres in Phase I and 61 acres in Phase II, for a total of 78 acres. This is about 8% of the entire Project area. Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices. The subclassification "e" indicates that the limitation is due to the risk of erosion.

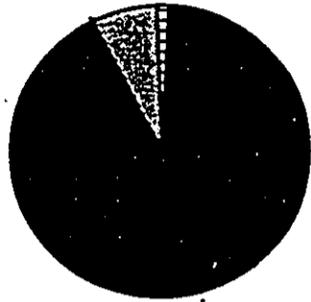
- (2) *Agricultural Lands of Importance in the State of Hawaii (ALISH), by the SCS, University of Hawaii (UH) College of Tropical Agriculture and Human Resources, and the State of Hawaii, Department of Agriculture.*^[3]

This system classifies lands into three categories: (a) "prime" agricultural land which is land that is best suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment; (b) "unique" agricultural land which is non-prime agricultural land that is currently used for the production of specific high-value crops; and (c) "other" agricultural land

Figure 1.— EAST KAPOLEI PROJECT: SOIL RATINGS

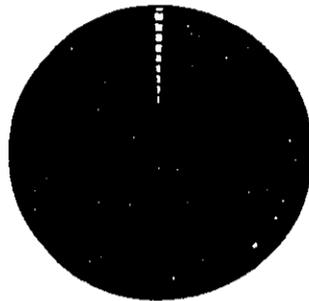
SCS Rating

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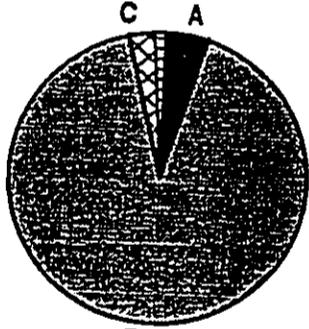
ALISH Rating

Reservoirs



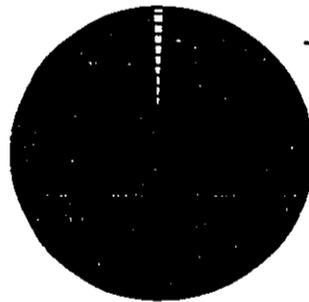
LSB Rating

Reservoirs



LESA Rating

Reservoirs



which is non-prime and non-unique agricultural land that is of importance to the production of crops.

All of the acreage in Phases I and II are rated "prime" except for the approximately 11 acres of reservoirs, which are unrated.

(3) *Overall Productivity Rating, by the UH Land Study Bureau (LSB).*^[2]

This classification rates soils according to five levels, with "A" representing the class of highest productivity and "E" the lowest. For each rating and phase, acreages are:

<u>LSB Rating</u>	<u>Phase I</u>	<u>Phase II</u>	<u>TOTAL</u>
A	0	49	49 (5%)
B	471	464	935 (91%)
C	27	0	27 (3%)
Reservoirs	2	9	11 (1%)

The "B" rating reflects moderate rather than good drainage, while the "C" rating reflects both moderate drainage and slopes in excess of 10%.

(4) *Proposed Land Evaluation and Site Assessment (LESA) System, by the State of Hawaii Land Evaluation and Site Assessment Commission.*^[4]

Based on soil quality, locational attributes, improvements, nearby activities, and land-use plans, this proposed classification system would designate a sufficient amount of the better agricultural lands in order that projected agricultural goals can be met. If the LESA classification approach were applied, the designated lands would be termed "important agricultural lands" (IAL), and would include all lands having a rating of 66 or above, out of a possible total of 100. The LESA rating for each soil type is shown in Table 1.

Based on the proposed ratings, all of the Project area would be designated as IAL.

Taking all four of the above soil-rating systems into consideration, all of the property is comprised of good soils.

Soil Uses

Suitable agricultural activities associated with the affected soil types include sugarcane, pineapple and pasture (see Table 1). However, the fields are at too low of an elevation and temperatures are too warm for pineapple production; if grown at this location, the fruit would burn.

Elevation and Terrain

Most of the terrain is nearly level or moderately sloped, and ranges in elevation from 50 feet to 170 feet altitude.^[2] However, about 27 acres in Phase I has slopes between 11 and 20%.

Climatic Conditions

The Project area is one of the sunniest areas on Oahu, having an average daily insolation of over 500 calories per square centimeter.^[5] Rainfall averages just slightly over 20 inches per year.^[6]

The average low temperature ranges from about 60° Fahrenheit in the winter to about 70° in the summer, while the average high temperature ranges from just under 80° in the winter to just under 90° in the summer.^[6]

Irrigation Water

The area has been irrigated with groundwater. Pumping costs are relatively low given the short lift.

Improvements

The property is serviced with high-quality dirt roads, a drip irrigation system, and electrical power to drive large-volume pumps.

Locational Advantages

The subject fields are a short trucking distance to:

- the large Honolulu consumer market,
- Honolulu supply markets,

- the airport for air-freighting produce to overseas markets,
- Honolulu Harbor and Barbers Point Harbor for surface shipping of produce to overseas markets, and
- research support from the Hawaiian Sugar Planters' Association and the University of Hawaii.

Summary

Assuming typical land rents for agriculture, nearly the entire Project area would be good for crop production. In fact, the lands would be among the best in the State for growing a variety of crops inasmuch as the area offers excellent agronomic conditions and is in a highly desirable location. The major disadvantage is that labor costs for farming activities on Oahu are higher than those in some rural areas on the Neighbor Islands.

Because of relatively high sugarcane yields and low farming costs, the central portion of the Ewa plain was referred to as the "golden triangle."

IMPACT ON SUGARCANE OPERATIONS

The property is leased to Oahu Sugar Co., Ltd. (OSCo) until mid-1995, specifically for the cultivation of sugarcane. However, Amfac/JMB Hawaii (Amfac), which owns OSCo, has announced that it will close this unprofitable plantation in 1995 after the final harvest.

Inasmuch as OSCo is closing for reasons unrelated to the proposed development, and will close before development is scheduled to begin, the Project will have no impact on sugar operations.

IMPACT ON PINEAPPLE OPERATIONS

The Ewa/Poamoho Land Exchange

The 500 acres of land in Ewa for Phase I of the Project were obtained through a land exchange with the State of Hawaii. For its part, the State received from the George Galbraith Trust about 2,000 acres of land north of Wahiawa in the Poamoho area. The exchange was made in order to retain these lands in agriculture while using other lands for much-needed housing.

Since the Poamoho lands are being cultivated in pineapple, the proposed Project indirectly affects pineapple operations; this is addressed below.

Agricultural Quality of the Poamoho Lands

The Poamoho lands are well-suited for pineapple cultivation: soils are deep, well drained, and easy to work; large expanses of flat fields favor use of mechanized equipment; moderate rainfall eliminates the need for installing expensive drip irrigation and also reduces pumping costs for overhead spraying; and temperatures favor summer crops.^[7]

However, the Poamoho fields are not favored for cultivating most other crops because of relatively low sunshine in the area and expensive irrigation water, particularly since most crops require far more water than does pineapple.^[7]

Del Monte Fresh Produce (Hawaii) Inc.

Del Monte Fresh Produce (Hawaii) Inc. ("Del Monte") traces its Hawaii roots back to 1898.^[7] Currently, its plantation covers about 7,400 acres of leased land, including the Poamoho lands mentioned above and lands in upper Kunia. Nearly 4,800 acres in upper Kunia are leased from the Estate of James Campbell under a 14-year lease that was signed in May 1994.^[8] Most of the remaining lands are leased from the State, including the Poamoho lands recently obtained from the George Galbraith Trust, and an additional 580 acres in upper Kunia.

Del Monte farms about 4,400 acres, including fields that are temporarily fallowed as part of the normal crop cycle.^[8] Remaining lands include those which are used for its Kunia headquarters, plantation villages, and roads; gullies; and other lands that are unsuitable or uneconomical for mechanized farming.

Pineapple grown in Hawaii by Del Monte is destined for four markets: fresh whole pineapple, "fresh-chilled" pineapple (which is cut), frozen pineapple, and juice concentrate.^[7] Del Monte no longer grows pineapple in Hawaii for the canned market because of the low cost of production in Asia and elsewhere.

The fresh-whole and fresh-chilled pineapple are marketed primarily on the U.S. mainland.^[7] Nearly two-thirds of it is shipped by air and arrives at market within 48

hours of the time it leaves the fields, with the remainder being shipped in refrigerated cargo ships which arrive at west coast markets 6 to 10 days after harvesting. Juice concentrate and frozen pineapple are marketed on the mainland and in Asia, and are transported by cargo ship.

Fresh-pineapple production remains economically viable on Oahu because of the excellent air transportation to the mainland, thanks largely to Hawaii's visitor industry.^[7] Flights to a number of major cities are frequent and reliable, and "back-haul" rates are favorable. In contrast, it is not practical to deliver a large volume of fresh pineapple within 48 hours to many U.S. markets from Maui, Mexico, Central America, the Caribbean, or Asia.

In 1993, Del Monte's Hawaii operation harvested nearly 100,000 tons of pineapple, and generated sales exceeding \$54 million.^[8] Del Monte has been only marginally profitable in recent years, but the company anticipates profitable operations based on its ability to produce high-value fresh-whole and fresh-chilled pineapple, and the potential with regard to production of other crops.

Del Monte is field testing potatoes, dry-land taro, onions, tomatoes, melons, green peppers, sweet corn, and eggplant. It is also field testing pineapple cultivation in lower Kunia on former OSCo lands.^[8]

Del Monte's employment ranges from a low of about 630 workers during the winter months when planting is curtailed due to weather, to a high of about 690 workers in the summer at peak harvest, with an average over the year of about 650 jobs.^[8] Current employment totals 690 workers including: 338 field workers; 313 workers in the packing plants; and 39 workers in engineering, operations, research, and sales.

The skills required vary from highly skilled workers (managers, agronomists, engineers, researchers), to skilled (supervisors, technicians, mechanics, equipment operators, journeymen, secretaries, etc.), to semi-skilled (field workers, fruit packers, clerical help, etc.). Hourly wage rates for laborers range from about \$6 to over \$11, depending on grade level. Salaries are higher for the skilled jobs.

In addition to the direct employment provided by Del Monte, the company indirectly supports about 750 jobs because Del Monte and its employees purchase goods and services.^[9] Thus, total employment supported by the company amounts to about 1,400 direct and indirect jobs.

Proposed Poamoho Development

In 1993, a residential community was proposed on nearly 900 acres of Poamoho land.^[7] This project would have required Del Monte to secure replacement fields, most likely on lands in Kunia which are being released from sugarcane cultivation by OSCo.

Assuming replacement lands in this location, Del Monte would have had to expend about \$700,000 to convert the Kunia lands from sugarcane to pineapple.^[7] The fields would have had to have been laid out with proper spacing for Del Monte's harvesting equipment, and the existing drip irrigation system would have had to have been modified.

In addition, the planting schedule of fields throughout the Del Monte plantation would have had to have been modified, since Poamoho fields produce summer fruit while Kunia lands produce winter fruit.

Impact of the Proposed Project on Pineapple Operations

The proposed Project, and the underlying Ewa/Poamoho land exchange between the State of Hawaii and the George Galbraith Trust, avoids the adverse impact that would have occurred had the original development proceeded at Poamoho. Del Monte will be able to continue to grow pineapple on the excellent Poamoho fields, thereby avoiding the cost and disruption of relocating a major portion of its farm operation from Poamoho to Kunia.

INTERIM DIVERSIFIED-AGRICULTURE USE

Short-Term Agricultural Plans for the Project Lands

Current plans call for Phase I of the Project to be developed in seven sections, with home sales starting as early as 1997 and continuing to about 2004. As mentioned previously, Phase I consists of 500 acres of land which was obtained from the State. Until construction begins on a given section, the State will make the land available to farmers under short-term leases to grow seed corn and other diversified crops. An additional 800 acres of State land planned for a new University of Hawaii campus and other projects will also be made available to farmers under short-term leases.

Although discussions have taken place with potential farmers, land rents, water rates and other lease terms have yet to be negotiated. Also, water delivery and other infrastructure problems are not resolved. Finally, the demand for the subject land has yet to be determined,

Impact of the Short-Term Agricultural Plans on Agriculture.

Regarding the potential demand for this land, it should be noted that, because of the very substantial contraction of plantation agriculture in Hawaii, the supply of agricultural land available for diversified crops, both Statewide and on Oahu, *far* exceeds projected demand (see next section). Consequently, the temporary availability of the Project land for diversified crops will result in a comparatively small and temporary increase in what is already an excess supply of land for diversified agriculture, both Statewide and on Oahu.

In view of this excess supply, the temporary availability of the Project land for diversified crops is not expected to significantly affect the amount of agricultural activity Statewide or on Oahu. However, it may temporarily affect the location of some operations,

IMPACT ON THE GROWTH OF DIVERSIFIED AGRICULTURE

The development of the Project area constitutes a commitment of 1,022 acres of agricultural land to a non-agricultural use. This land commitment raises the question of whether the Project area will affect adversely the growth of diversified agriculture—either immediately or over the long term. Before addressing this question, *potential crops, land requirements, and the availability of land* for diversified agriculture are discussed below.

Potential Crops

Depending on lease rents and water costs, crops which could be grown profitably in the area for the Honolulu market include bananas, green beans, bittermelon, mustard cabbage, pak choy cabbage, sweet corn, cucumbers, daikon, dasheen, long eggplant, round eggplant, Manoa lettuce, lotus root, luau leaf, lychee, mango, dry onions,

green onions, parsley, Chinese peas, green peppers, pomelos, pumpkins, hechima squash, hyotan squash, Italian squash, sweet potatoes, tomatoes, watercress, watermelons, feed corn for green chop, flowers, potted foliage, and plants for landscaping.

Potential export crops would include flowers, potted foliage, seed crops, ginger root, and a few other crops.

A great many additional crops can be grown in Hawaii's year-round subtropical climate, but few can be grown profitably on a commercial scale. The primary reasons for this unprofitability are:

- Hawaii's subtropical climate is not well-suited to the commercial production of certain crops which grow better in the temperate mainland climates;
- for certain crops, special hybrids have not been developed that are adapted to Hawaii's subtropical climate;
- crop pests are more prevalent and more expensive to control in Hawaii than they are on the mainland, where the cold winters kill many pests;
- fruit-fly infestations prevent exports of many crops;
- Hawaii suffers from high farm-labor costs, largely because agriculture must compete for its labor against the visitor and related industries;
- high overseas transportation costs increase the cost of importing agricultural supplies and equipment;
- Hawaii's soils generally have low nutrient levels and therefore require high expenditures for fertilizer;
- Hawaii markets are easily glutted due to the comparatively small population (if just a few farmers grow the same crop, an oversupply to the market causes prices to fall, resulting in all of these farmers losing money);
- consumption volumes are too small to support large, efficient farms (i.e., Hawaii's population is too small to support farms that require economies of scale); and
- Hawaii farmers must compete against large mainland farms that can deliver produce to Hawaii more cheaply than it costs to produce the crop locally because these mainland farms (1) incur lower costs for land, labor, supplies, fertilizer, equipment, etc., and (2) produce high volumes that allow economies of scale.

Land Requirements for Diversified Agriculture

Based on projections made in 1991 by the State Department of Agriculture (DOA), additional Statewide land requirements to accommodate the growth of diversified agriculture to the year 2010 will amount to approximately 41,000 acres.^[10] The projections suggest that about 83% of this new acreage will be required for macadamia nut and coffee orchards, while about 7,000 acres will be required to accommodate the growth of other diversified-agriculture crops.

The projections indicate that most of this growth in diversified agriculture will occur on the Neighbor Islands, while Oahu will require only about 1,000 acres, of which about half would be for bananas.

Supply of Land for Diversified Agriculture—Statewide

With regard to the Statewide supply of agricultural land, an enormous and growing supply of this land is available for diversified agriculture. Since 1968, about 190,000 acres of Hawaii's higher-quality agricultural land have been or will soon be released from sugar and pineapple production, including land that is being released from sugar plantations which are closing.^[11-13] Including the acreage being released by OSCo, this is over five times the amount of sugar and pineapple land on Oahu—about 35,000 acres of plantation land which covers most of the Ewa Plain, Central Oahu, and the North Shore.

The amount of land released from sugar production will probably increase given that additional sugar plantations are struggling. Although a collapse of the sugar industry is not anticipated, further contraction of the industry will occur.

In addition, a portion of the existing sugarcane land is on hold awaiting the discovery of profitable replacement activities. This land also forms part of the supply of agricultural land available for profitable diversified-agriculture crops. Moreover, the greater the success of diversified agriculture, the greater the amount of land that will be released for diversified agriculture. Examples of sugarcane land being released for other crops include: macadamia nut orchards on land released from Mauna Kea Agribusiness Co., Inc.; macadamia nut and citrus orchards on land released from Ka'u Agribusiness Co., Inc.; macadamia nut orchards and pineapple operations on land re-

leased from Wailuku Agribusiness Co., Inc.; coffee orchards on land released by McBryde; seed corn and nursery operations on land released from HC&S; and seed corn operations on land released from Kekaha Sugar Co., Ltd.

Some of the land that has been—or soon will be—freed from plantation agriculture has been or is scheduled to be converted to urban, diversified-agriculture, and other uses. After making allowances for these conversions, uncommitted acreage which remains available for diversified agriculture amounts to over 150,000 acres.^[14] Much of this land is or will soon be fallow, or used for grazing, or is in some other low-value land-holding operation. For perspective, this is over four times the amount of sugar and pineapple land on Oahu. Also, this acreage figure is expected to increase as more land is released from sugar production.

Many of the lands freed, to be freed, or which can be freed from sugar and pineapple production have excellent agricultural qualities and climatic conditions, and are well-suited for a variety of crops. Also, water is available for most of these lands, particularly those which have been freed from sugar production.

Additional lands which have been made available for diversified agriculture are in government-sponsored agricultural parks throughout the State. Lands for agricultural activities which do not require prime agricultural land include pasture land, land for livestock operations, and "unique" lands as classified by ALISH (see page 3). Unique lands are not prime agricultural lands, but are important lands for certain crops, the principal examples are the coffee lands in Kona, and certain lava lands in Puna which are particularly well-suited for growing papaya. The supply of unique lands is quite large and is distinct from the supply of prime agricultural lands.

Supply of Land for Diversified Agriculture—Oahu

Lands Available for Diversified Agriculture

Truck farms on Oahu are located in Waimanalo (on former Waimanalo Sugar Co. lands), Waiahole and Waikane Valleys, Kahuku (on former Kahuku Plantation Co. lands), Waianae (some of which are on former Waianae Co. lands), and various other areas. These agricultural lands have yet to be fully utilized.

Existing and planned State agricultural parks located on Oahu include three existing projects and three planned ones:

	<u>Acres</u>	<u>Lots</u>	<u>Lot Size (Acres)</u>	<u>Use</u>
Existing Ag Parks:				
Waimanalo	196	20	5 to 10	Diversified crops
Waianae	150	17	5 to 10	Livestock, shade crops
Kahuku	220 233	24	5 to 10	Diversified crops, dairy
Planned Ag Parks:				
Kunia	150	20	5 to 15	Truck crops
Waiahole	379	45	—	Diversified crops
Kahuku	750 to 900	—	—	Livestock

Lands Being Released by OSCo

Because of the closure of OSCo, a dramatic increase in the supply of land available on Oahu for diversified agriculture is scheduled to occur. Approximately 10,500 acres will be released from sugar production over the 2 years from 1993 to 1995. However, over the next 20 years, as many as 3,500 acres of the OSCo lands may be urbanized, including the subject lands as well as lands to the west of Kapolei, to the south of Ewa Villages, and to the north of Royal Kunia up to the high-voltage power lines which cross Central Oahu.

This will leave approximately 7,000 acres available for agriculture. About 4,800 acres in Kunia and central Ewa are among the best agricultural lands in the State: agronomic conditions are excellent, water is inexpensive, and the location is excellent. The Navy lands in Ewa and on Waipio Peninsula, which total about 2,200 acres, share many of these same characteristics, although the soils are not as good.

In addition to the above, over 1,000 acres of fallowed land are in the foothills west of Kunia Road. OSCo stopped farming these fields in the early 1980s because of the high cost of pumping water to them.

Nearly all of the privately-owned Kunia and central Ewa lands are likely to remain available for agriculture far into the future because:

- landowners intend to keep this land in agriculture;
- development plans, for the most part, favor urbanizing lower-quality agricultural lands rather than the remaining Kunia and central Ewa lands;
- housing needs can be accommodated far into the future by the existing, planned and potential developments (assuming continued and new development approvals for the East Kapolei Project, Kapolei, West Loch, Ewa Gentry, Waiawa Gentry, Ewa Marina, Laulani/Fairways, Ko Olina, Makakilo, Makaiwa, Royal Kunia Phases I and II, Waikele, Mililani Mauka, etc.); and
- use of Waiahole Ditch water on crops in Kunia would enable valuable water systems to be maintained, and a portion of the water would continue to seep down and recharge the groundwater supply.

Potential Release of Additional Land for Diversified Agriculture

Waialua Sugar Co., Inc. (WSCo), which has been unprofitable for a number of years, has also announced that it may close. Such a closure would release additional land for diversified agriculture; in 1991, WSCo farmed slightly more than 12,000 acres.^[12]

Outlook for Diversified Agriculture

Based on the above assessment, ample prime agricultural land will be available to easily accommodate the Statewide and Oahu requirements of diversified agriculture. This conclusion derives from the following: (1) a vast amount of prime agricultural land and water is available, having been freed from sugar and pineapple production in recent years; (2) additional sugarcane acreage and water will be freed within the next few years; (3) some, if not most, of the sugar companies are willing to make their lands available for profitable replacement crops to the extent that such crops exist; and, in contrast, (4) land requirements for diversified agriculture are surprisingly modest.

Impact of the East Kapolei Project on the Growth of Diversified Agriculture

As the discussion above indicates, the limiting factor to the growth of diversified agriculture will *not* be the *land supply*, but rather the *size of the market* for those crops that can be grown profitably in Hawaii. The proposed East Kapolei Project involves far too little land to affect this conclusion, and will therefore not affect adversely the growth of diversified agriculture, Statewide or on Oahu.

CONSISTENCY WITH STATE AND COUNTY PLANS

The *Hawaii State Constitution*, the *Hawaii State Plan*, the *State Agriculture Functional Plan*, and the *General Plan of the City and County of Honolulu* call for preserving the economic viability of plantation agriculture and promoting the growth of diversified agriculture (see Table 2). To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to *plantation agriculture*, development of the Project will have no impact on the sugar industry since sugar operations in the area are closing for reasons unrelated to the Project. However, the Project and the underlying Ewa/Poamoho land exchange will indirectly benefit the pineapple industry. Because the original project at Poamoho will not proceed and the Poamoho lands have been transferred to the State, Del Monte will be able to continue to grow pineapple on these excellent fields, thereby avoiding the cost and disruption of relocating a major portion of its farm operation from Poamoho to Kunia.

With regard to *diversified agriculture*, there will be a temporary benefit in that the 500 acres in Phase I will be made available for diversified crops until the land is needed for development. Over the longer term, development of the Project will not limit the growth of diversified agriculture since far more agricultural land has been released from plantation agriculture than has been absorbed by other activities; growth of diversified agriculture will be limited by the size of the market, not the land supply.

In view of these findings, the Project will not conflict with the major thrust of the diversified-agriculture portion of State and County Plans.

The Project is consistent with population-growth and housing policies which call for "non-essential agricultural lands" to be made available for "low- and moderate-income and gap group housing" and "appropriate urban uses."

Regarding policies "...to preserve and protect agricultural lands," discussions in the Agriculture portion of the *State Functional Plan* recognize that redesignation of lands from Agriculture to Urban should be allowed "... upon a demonstrated change in economic or social conditions, and where the requested redesignation will provide greater benefits to the general public than its retention in ..." agriculture; that is, when an "overriding public interest exists."⁽¹⁵⁾ The enormous contraction in plantation agriculture—resulting in the supply of agricultural land, water and labor far exceeding projected demand—constitutes a major change in economic and social conditions. Furthermore, the proposed development of homes will provide significant social benefits.

Table 2.—SELECTED STATE AND COUNTY OBJECTIVES,
POLICIES, AND GUIDELINES RELATED
TO AGRICULTURAL LANDS

HAWAII STATE CONSTITUTION (Article XI, Section 3):

...to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands...

HAWAII STATE PLAN (Chapter 226, Hawaii Revised Statutes, as amended):^(16,17)

Section 226-7 Objectives and policies for the economy--agriculture.

- (a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:
 - (1) Viability in Hawaii's sugar and pineapple industries.
 - (2) Growth and development of diversified agriculture throughout the State.
 - (3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.
- (b) To achieve the agricultural objectives, it shall be the policy of the State to:
 - (2) Encourage agriculture by making best use of natural resources.
 - (10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.
 - (16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.

Table 2.—SELECTED STATE AND COUNTY OBJECTIVES,
POLICIES, AND GUIDELINES RELATED
TO AGRICULTURAL LANDS
(continued)

Section 226-103 Economic priority guidelines.

- (c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:
 - (1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.
- (d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:
 - (1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.
 - (10) Support the continuation of land currently in use for diversified agriculture.

Section 226-104 Population growth and land resources priority guidelines.

- (b) Priority guidelines for regional growth distribution and land resource utilization:
 - (2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.

Section 226-106 Affordable Housing

Priority guidelines for the provision of affordable housing:

- (1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.

Table 2.—SELECTED STATE AND COUNTY OBJECTIVES,
POLICIES, AND GUIDELINES RELATED
TO AGRICULTURAL LANDS
(continued)

AGRICULTURE STATE FUNCTIONAL PLAN (1991)⁽¹⁵⁾
(Functional plans are guidelines for implementing the State Plan. They are approved by the Governor, but not adopted by the State Legislature.)

Objective H: Achievement of Productive Agricultural Use of Lands Most Suitable and Needed for Agriculture.

Policy H(2): Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution.

Action H(2)(a): Propose enactment of standards and criteria to identify, conserve, and protect important agricultural lands and lands in agricultural use.

Action H(2)(c): Administer land use district boundary amendments, permitted land uses, infrastructure standards, and other planning and regulatory functions on important agricultural lands and lands in agricultural use, so as to ensure the availability of agriculturally suitable lands and promote diversified agriculture.

CITY AND COUNTY OF HONOLULU
GENERAL PLAN, Objectives and Policies (Resolution No. 87-211)⁽¹⁸⁾

Economic Activity

Objective C. To maintain the viability of agriculture on Oahu.

Policy 4. Provide sufficient agricultural land in Ewa, Central Oahu, and the North Shore to encourage the continuation of sugar and pineapple as viable industries.

Policy 5. Maintain agricultural land along the Windward, North Shore, and Waianae coasts for truck farming, flower growing, aquaculture, livestock production, and other types of diversified agriculture.

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Appendix H

Oahu Biological Resources Survey Report
Evangeline Funk, Ph.D., July 1994

BIOLOGICAL RESOURCES SURVEY REPORT FOR SCHULER HOMES
EAST KAPOLEI PROJECT, EAST KAPOLEI, OAHU
HAWAII

FOR
SCHULER HOMES, INC.
828 FORT STREET MALL, 4TH FLOOR
HONOLULU, HAWAII 96813

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BOTANICAL SURVEY REPORT FOR SCHULER HOMES EAST KAPOLEI PROJECT SITE

INTRODUCTION

A botanical survey of the proposed Schuler Homes East Kapolei Project Site, East Kapolei, Oahu, Hawaii was undertaken in July, 1994. The purpose for the survey of this 1000 acre site was to collect data for the preparation of a species list; to describe the vegetation of the site; and to ascertain if any proposed or listed, threatened or endangered plants are growing in the area (USFWS 1993).

METHODS

The walk-through method was used during the data collection phase of the survey. All parts of the site were examined except the interior portions of the producing sugar cane and corn fields.

BOTANICAL HISTORY

In 1971 the first environmental impact statement for a site in the Ewa District was submitted to the Planning Commission by the Hawaii Housing Authority (HHA 1971), for a project known as Ewalani Village. It appears that, at that time, information on either the flora or fauna of the study site was not required because none was included. It wasn't until 1976 that an environmental impact statement for a project in the Ewa area included the reports and observations of environmental specialists who had been engaged especially to inventory the natural resources of project sites. The pioneer work was commissioned by the U. S. Army Corps of Engineers and carried out by Derral Herbst (Herbst 1976). Dr. Herbst's report alerted the community to the presence of endangered plant species in the area. This pioneer work is still consulted by naturalists interested in the flora of the Ewa Plains.

Since 1976, more than twenty-eight environmental impact statements for projects in the area have been prepared and are on file at the Environmental Center of the University of Hawaii. In spite of this large body of biological information, nothing has been published on either the botany or the avifauna of the area considered herein.

ENDANGERED SPECIES

The endangered species found by Herbst in 1976 were *Achyranthes splendens* var. *rotundata* HBD and *Euphorbia skottsbergii* var. *kalaekoana* Sherff (USFWS 1989). These are listed endangered species. They have been reported from Barber's Point Naval Air Station and near the Deep Draft Harbor (Herbst 1976, Funk 1984). During this survey no proposed or listed, threatened or endangered species were found on the proposed Schuler Homes East Kapolei Project Site (USFWS 1993).

RESULTS

Three vegetation types can be found in the study area. They are Ruderal or Wayside Vegetation, Koa Haole/Grass, and Agricultural Fields. None of these vegetation types contained endemic (native only to Hawaii), or indigenous (native to Hawaii and other places) plant species in great numbers. In fact, the only indigenous taxa found are 'Ilima (*Sida fallax* L.), Popolo (*Solanum americanum* Mill.) and 'Akulikuli (*Sesuvium portulacastrum* (L.) L.). These plants appear most commonly in the Ruderal or Wayside Vegetation along the cane haul roads and irrigation ditches.

A. Ruderal or Wayside Vegetation Community. This vegetation type is found along all the major and minor roadways and along the flumes and irrigation ditches of the site. It is composed almost entirely of introduced forbs (herbs) and grasses, except for the species mentioned above. The

plants which make up the Ruderal or Wayside Vegetation Community are almost all annuals, that is, they come up, flower, and produce seeds in a single, short growing season. The plants of this vegetation community are important because considerable time and money is spent by sugar growers in an effort to control them. In many parts of the study site the Ruderal or Wayside Community had been treated with herbicide and dead skeletons of the plants remain.

B. Koa Haole/Grass. The second vegetation type, Koa Haole/Guinea Grass is found along the western boundary of the study site where it abuts Kaloi Gulch. The berms on either side of the gulch are two to three meters above the level of the cane fields and the gulch varies from three to four meters across. Both berms are lined with small koa haole trees (*Leucaena leucocephala* (Lam.) deWit) which average three to five meters in height. The understory is a dense growth of guinea grass. In the few openings in the guinea grass, large castor bean (*Ricinus communis* L.) and cocklebur (*Xanthium saccharatum* Wallr.) bushes thrive. This vegetation type is noteworthy only because of the high number and variety of common bird species which inhabit the koa haole trees and feed on the grass seeds.

C. Sugar Cane Fields. The Sugar Cane fields are single species monocultures of *Saccharum officinarum* L. Some of the cane fields of the study site are in production and support a thriving crop. These areas are currently being watered. Other fields appear to support a volunteer crop of cane and still others are fallow. In one field near Kaloi Gulch a large, experimental crop of several varieties of sweet corn (*Zea maize* L.) is being cultivated.

At the edges of the cultivated fields, where water is available, the

grasses and weeds are thriving. Common among them are stargrass (*Chloris divaricata* R. Br.), goose grass (*Elusine indica* (L.) Gaertn., sprangletop (*Leptochloa uninervia* (K.Presl) Hitchc.), spiny amaranth (*Amaranthus spinosus* L.), balsam apple (*Momordica charantia* Crantz Urban), and ivory gourd (*Coccinia grandis* (V.) Voight).

In fallow fields and in those in which a volunteer crop has been allowed to grow up, weedy plants, the seeds of which are spread about by the bulbuls and by the wind are the most common. Balsam apple and ivory gourd vines produce fruits which are eaten by bulbuls and these plants are found in all parts of the site. The wind distributed African tulip tree (*Spathodea campanulata* Beauv.), is also thriving.

This land has been under cultivation for a long, long time and the native plant community has completely disappeared.

CONCLUSIONS

The flora of the proposed Schuler Homes East Kapolei Project site is composed almost entirely of introduced species. There are no endemic plant species in the area. The three indigenous plants, 'Ilima, Popolo, and 'Akulikuli found on the site are still very common in the coastal lowlands of most of the Hawaiian Islands. The remaining botanical resources of this site are introduced plants, most of which are considered to be weeds. Therefore, future development of the site will not have a significant impact on the flora of the area. Vegetation similar to that found on this site is common throughout the islands.

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SPECIES LIST OF ALL PLANTS

FOUND ON THE SCHULER HOMES EAST KAPOLEI PROJECT SITE

The plant families in the following species list have been alphabetically arranged within two groups, Monocotyledons, and Dicotyledons. The genera and species are arranged alphabetically within families. The taxonomy and nomenclature follow that of St. John (1973) and Wagner, Herbst and Sohmer (1990). For each taxon the following information is provided:

1. An asterisk before the plant name indicates a plant introduced to The Hawaiian Islands since Cook or by the aborigines.
2. The scientific name.
3. The Hawaiian name and or the most widely used common name.
4. Abundance ratings are for this site only and they have the following

meanings:

Uncommon = a plant that was found less than five times.

Occasional = a plant that was found between five to ten times.

Common = a plant considered an important part of the vegetation

Locally abundant = plants found in large numbers over a limited area. For example the plants found in grassy patches.

This species list is the result of an extensive survey of this site during the hot, dry summer season (July 1994) and it reflects the vegetative composition of the flora during a single season. Minor changes in the vegetation will occur due to introductions and losses and a slightly different species list would result from a survey conducted during a different growing season.

CHECKLIST

Scientific Name	Common Name	Abundance
MONOCOTYLEDONES		
AGAVACEAE - Agave Family		
* <i>Cordyline fruticosa</i> (L.) A. Chev.	Ti	Uncommon
CYPERACEAE - Sedge Family		
* <i>Cyperus rotundus</i> L.	Nut grass	Common
POACEAE - Grass Family		
* <i>Cenchrus ciliaris</i> L.	Buffel grass	Locally abundant
* <i>Cenchrus echinatus</i> L.	Sandbur grass	Locally abundant
* <i>Chloris barbata</i> Swartz	Swollen fingergrass	Locally abundant
* <i>Chloris divaricata</i> R. Br.	Occasional	Common
* <i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Common
* <i>Digitaria adscendens</i> (HBK) Henr.	Henry's crabgrass	Occasional
* <i>Digitaria insularis</i> (L.) Mez	Sourgrass	Occasional
* <i>Eleusine indica</i> (L.) Gaertn.	Wiregrass	Common
* <i>Eragrostis cilianensis</i> (All.) Link	Stinkgrass	Occasional
* <i>Eragrostis tenella</i> (L.) Beauv. R. & S.	Japanese lovegrass	Locally abundant
* <i>Leptochloa uninervia</i> (K. Presl) Hitchc.		Uncommon
* <i>Panicum maximum</i> Jacq.	Guinea grass	Common
* <i>Rhynchelytrum repens</i> C.E. Hubb	Natal redtop	Common
* <i>Saccharum officinarum</i> L.	Ko or sugar cane	Common
* <i>Setaria gracilis</i> Kunth	Yellow Foxtail	Locally abundant
* <i>Setaria verticillata</i> (L.) P. Beauv	Bristly Foxtail	Locally abundant
* <i>Sorghum halpense</i> (L.) Pers.	Johnson grass	Occasional
* <i>Zea maize</i> L.	Sweet Corn	Locally abundant

DICOTYLEDONES

ACANTHACEAE - Acanthus Family		
* <i>Asystasia gangetica</i> (L.) T. Anders	Chinese violet	Common
AIZOACEAE - Fig-marigold Family		
<i>Sesuvium portulacastrum</i> (L.) L.	'Akulikuli	Occasional
* <i>Trianthema portulacastrum</i> L.		Common

Scientific Name	Common Name	Abundance
AMARANTHACEAE - Amaranth Family		
* <i>Alternanthera pungens</i> Kunth	Khahi	Locally abundant
* <i>Amaranthus spinosus</i> L.	Spiny amaranth	Common
* <i>Amaranthus viridis</i> L.	Slender amaranth	Occasional
* <i>Gomphrena celosioides</i> Mart.	Globe amaranth	Uncommon
ANACARDIACEAE - Mango Family		
* <i>Mangifera indica</i> L.	Mango	Uncommon
* <i>Schinus terebinthifolius</i> Raddi	Christmas berry	Uncommon
APIACEAE - Parsley Family		
* <i>Daucus pusillus</i> Michx.	American carrot	Locally abundant
ASTERACEAE - Sunflower Family		
* <i>Bidens pilosa</i> L.	Spanish needle	Common
* <i>Calyptocarpus vialis</i> Less.		Occasional
* <i>Coryza canadensis</i> Cronq.	Canadian fleabane	Occasional
* <i>Echinachloa colona</i> (L.) Link	Jungle-rice	Locally abundant
* <i>Emilia sonchifolia</i> (L.) DC	Flora's paintbrush	Common
* <i>Emilia fosbergii</i> Nicolson	Pualele	Common
* <i>Lactuca scariola</i> L.	Wild lettuce	Common
* <i>Pluchea indica</i> (L.) Less.	Indian pluchea	Common
* <i>Pluchea symphytifolia</i> (L.) Cass.	Sourbush	Occasional
* <i>Sonchus olerarceus</i> L.	Pualele	Occasional
* <i>Synedrella nodiflora</i> (L.) Gaertn.	Synedrella	Locally abundant
* <i>Tridax procumbens</i> L.	Coat buttons	Locally abundant
* <i>Verbesina encelioides</i> Cav.	Golden crown-beard	Occasional
* <i>Vernonia cinerea</i> (L.) Less.	Little ironweed	Occasional
* <i>Xanthium saccharatum</i> Wallr.	Cocklebur	Uncommon
BIGNONIACEAE - Bignonia Family		
* <i>Spathodea campanulata</i> Beauv.	African tulip tree	Occasional
BORAGINACEAE - Heliotrope Family		
* <i>Heliotropium procumbens</i> Mill		Occasional
CAPPARIS - Caper Bush Family		
* <i>Cleome gynandra</i> L.	Wild spider flower	Locally abundant
CHENOPODIACEAE - Goosefoot Family		
* <i>Atriplex semibaccata</i> R. Br.	Australian saltbush	Occasional
* <i>Chenopodium ambrosioides</i> L.	Mexican tea	Occasional
* <i>Chenopodium murale</i> L.	Lambs quarters	Uncommon

Scientific Name	Common Name	Abundance
CONVOLVULACEAE - Morningglory Family		
* <i>Ipomoea obscura</i> (L.) Ker-Gawl		Occasional
* <i>Ipomoea triloba</i> L.	Little Bell	Occasional
* <i>Merremia aegyptia</i> Urban	Hairy merremia	Common
CUCURBITACEAE - Cucumber Family		
* <i>Coccinia grandis</i> (L.) Voigt	Ivory gourd	Common
* <i>Cucumis dipsaceus</i> Ehrenb. ex Spach	Hedgehog Gourd	Abundant
* <i>Momordica charantia</i> Crantz	Balsam apple	Common
EUPHORBIACEAE - Spurge Family		
* <i>Euphorbia cyathophora</i> Murr.	Mexican fire plant	Locally abundant
* <i>Chamaesyce glomerifera</i> L. Wheeler	Graceful spurge	Locally abundant
* <i>Chamaesyce hirta</i> L.	Hairy spurge	Common
* <i>Chamaesyce prostrata</i> (Ait) Millsp.	Prostrate spurge	Occasional
* <i>Ricinus communis</i> L.	Castor bean	Locally abundant
FABACEAE - Bean Family		
* <i>Chamaecrista nictitans</i> (L.) Moench	Japanese tea	Occasional
* <i>Crotalaria incana</i> L.	Fuzzy rattle-pod	Occasional
* <i>Crotalaria mucronata</i> L.	Smooth rattle-pod	Common
* <i>Desmanthus virgatus</i> Willd.	Virgate mimosa	Occasional
* <i>Indigofera spicata</i> Frosk.	Indigo	Occasional
* <i>Indigofera suffruticosa</i> Mill.	Indigo	Occasional
* <i>Leucaena leucocephala</i> Lam deWit	Koa-haole	Common
* <i>Macroptilium atropurpureum</i> (DC) Urb.		Locally abundant
* <i>Macroptilium coccineus</i> L.	Scarlet runner	Common
* <i>Pithecellobium dulce</i> Benth.	Madras thorn	Occasional
* <i>Prosopis pallida</i> HBK	Kiawe, algaroba	Occasional
* <i>Vigna sesquipedalis</i> Wight	Long beans	Uncommon
LABIATAE - Mint Family		
* <i>Leonotis nepetaefolia</i> Ait	Lion's-ear	Uncommon
MALVACEAE - Hibiscus Family		
* <i>Abutilon grandifolium</i> Sweet	Hairy abutilon	Uncommon
* <i>Malvastrum coromandelianum</i> Garcke	False marrow	Common
* <i>Sida fallax</i> Walp.	'Ilima	Common
* <i>Sida rhombifolia</i> L.	Cuba jute	Occasional
* <i>Sida spinosa</i> L.	Prickly sida	Occasional

Scientific Name	Common Name	Abundance
NYCTAGINACEAE - Four o'clock Family		
* <i>Boerhavia coccinea</i> Mill.		Common
PASSIFLORACEAE - Passion Flower Family		
* <i>Passiflora foetida</i> L.	Love-in-a-mist	Occasional
PORTULACACEAE - Portulaca Family		
* <i>Portulaca oleracea</i> L.	Pigweed	Common
SOLANACEAE - Tomato Family		
* <i>Datura stramonium</i> L.	Jimson weed	Occasional
* <i>Lycopersicon esculentum</i> Mill	Tomato	Locally abundant
* <i>Lycopersicon pimppinellifolium</i> (Jusl.) Mill	Currant tomato	Common
* <i>Nicandra physalodes</i> (L.) Gaertn.	Apple of Peru	Common
* <i>Nicotiana glauca</i> R.C. Graham	Tree tobacco	Occasional
<i>Solanum americanum</i> Mill.	Popolo	Occasional
STERCULIACEAE - Stink tree Family		
* <i>Waltheria indica</i> L.	Hi'aloa, uha-loa	Locally abundant
ZYGOPHYLLACEAE - Tribulus Family		
* <i>Tribulus terrestris</i> L.	Puncture vine	Common

FAUNA SURVEY REPORT FOR THE PROPOSED SCHULER HOMES

EAST KAPOLEI PROJECT

Introduction and Methods

This report summarizes the results of a fauna survey of the 1000 acre proposed Schuler Homes East Kapolei Project Site which was conducted in July, 1994. Since 1971 more than twenty-eight environmental impact statements have been written for projects proposed for the Ewa area. All of these reports have contained faunal reports of one sort or another, yet virtually nothing has been published on either the birds or the mammals of the region. The standard references for birds of Hawaii (Munro 1944, Berger 1981, Hawaii Audubon Society 1984) do not specify the area in their distribution of species.

Two circular plot censuses and eight fixed station observation points (20 minutes at each station) were carried out during early and late daylight hours in order to take advantage of the higher activity levels of both birds and mammals during cooler parts of the day.

Results

Mammals - Only one species of mammal was found during the survey. That was a Mongoose (*Herpestes auropunctatus*) seen at the junction of Kaloi Gulch and Farrington Highway. The mongoose was introduced to Hawaii and is not considered to be endangered or threatened in any way.

Birds - Because the entire site has been extensively modified from its original state, it has almost no value as native bird habitat. However, it does support a variety of non-native species. The two most important bird observation areas in the study site were along the flumes and water ways and in the Koa haole/Grass vegetation type found along Kaloi Gulch.

The flumes and ditches are favored because they provide a source of water

in this otherwise parched area. The Koa haole/grass vegetation type provides a rich source of food for seed eating birds. Two of the bird species reported here were only seen overflying the site, cattle egrets and pigeons.

SPECIES LIST

Fourteen species of birds were found on and around the study site. No threatened or endangered species were found. The annotated checklist follows the nomenclature of Pratt, Bruner and Berrett (1987).

Family Zosteropidae: White-eyes

Zosterops japonicus

White-eyes are one of the most widespread introduced bird species in Hawaii. Although their preferred habitats are wetter than the study area, they were found in the Bluffs vegetation in low numbers.

Family Passeridae: Old World Sparrows

Passer domesticus (House sparrow)

House sparrows are sometimes called feathered mice. These streaky brown and gray birds are a familiar commensal species and were found near the flumes and pump stations in the weedy scrub.

Family Estrildidae: Waxbills, Mannikins and Parrotfinches

Estrilda astrild (Common Waxbill)

The common waxbill is a small, red-billed finch with a prominent red streak from its bill to its eye. Waxbills have a long tail and brown rump. They feed on grass seeds. Several large coveys of waxbills were seen feeding on the grass heads.

Lonchura malacca (Chestnut Mannikin)

These are tiny, small, dark birds with large, light colored bills.

Chestnut mannikins are one of most common bird on this site. The coats of the males appear red in the early morning light. Chestnut mannikins were seen in large numbers along the cane haul roads and on grass heads near drainage ditches.

Lonchura punctilata (Nutmeg Mannikin)

These nervous, little birds have dark bills and heads. Their alternate black and white breast feathers appear gray. On the Schuler Site, Nutmeg Mannikins were often seen in company with the Waxbills feeding in grassy thickets.

Family Emberizidae: Emberizine Finches

Paroaria coronata (Brazilian or red crested cardinal)

Several adult pairs, and many juvenile brazilian cardinals were seen in the big trees of the Bluff vegetation. The bright red heads of this species make them very easy to recognize.

Cardinalis cardinalis (Northern cardinal)

A pair of northern cardinals inhabit the opiuma trees near the north east corner of the site. The bright red coloring of the male bird make him easily recognizeable. The call of these birds is very distinctive.

Family Pycnonotidae: Bulbuls

Pycnonotus cafer (Red-vented bulbul)

Many of these large, raucous birds inhabit the study site. They were common along the roads, in the sugar cane, on power lines and in the large trees. Bulbuls are conspicuous for their noisy call and the bright red feathers beneath their tails. They are fruit eaters and they may be responsible for the spread of ivory gourd (*Coccinia grandis* (L.) Voigt), the large, dark green cucurbit vine which bears bright red fruits, and is common throughout the site.

Family Ardeidae: Herons, Egrets and Bitterns

Bubulcus ibis (Cattle egret)

Several of these large, white birds were seen flying above the sugar fields.

Introduced in 1957 to help control cattle insect pests, cattle egrets have proliferated and are now pests themselves.

Family Fringillidae: Cardueline Finches

Carpodacus mexicanus (House finch)

The house finch is a small, sparrowlike bird with a streaked appearance. The head, throat and breast of male birds may vary from dull yellow to bright red. The females and the bodies of males are similar with gray to black streaks of color.

Introduced into Hawaii during the last century, the house finch has adapted and is now widespread throughout the islands. Many pairs of birds were seen around the pumping stations, in the mango tree and along Kalo Gulch.

Family Columbidae: Pigeons and Doves

Streptopelia chinensis (Spotted Dove)

The spotted dove is a large bird which is grayish brown with rosy blushed breast feathers. At the sides and back of the neck is a patch of black with white spots. The low, repetitive cooing of the spotted dove was heard throughout the site. Many pairs and individuals were seen in the young cane fields.

Geopelia striata (Zebra Dove)

This ground dwelling, seed eating dove is smaller and even more abundant than the spotted dove. Zebra doves were found in similar densities

as the spotted dove in the open weedy places, but were most common along the roads.

Columba livia (Rock Dove)

A large flock of mixed plumage rock doves over fly the study sight during the early morning hours on week-ends. They approach the site from the Honouliuli area and disappear into the same area.

Family Sturnidae: Starlings and Mynas

Acridotheres tristis (Common Myna)

The ubiquitous myna is a plump brown bird with a black head and tail. It has a white belly, tail tip and wing patches, and bright yellow legs, feet, bill, and eye liners. Only two mynas were seen near Fernandes Village.

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Appendix I

Air Quality Impact Report, East Kapolei Project
J.W. Morrow, October 1994

AIR QUALITY IMPACT REPORT

EAST KAPOLEI PROJECT

4 October 1994

PREPARED FOR:

Gray, Hong, Bills & Associates

and

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1. INTRODUCTION

Schuler Homes, Inc. is proposing to construct a primarily residential project on an approximately 1,000-acre parcel in the Ewa District of the island of Oahu (Figure 1). The property was formerly used for sugar cane cultivation (Figure 2).

The intent is to develop the project in two phases to be completed in 2005 and 2011, respectively. The proposed land uses are summarized in Table 1.

TABLE 1
PROPOSED LAND USES
(Acres)

LAND USE	PHASE 1	PHASE 2	TOTAL
Residential	458	490	948
Commercial	10	10	20
School	12	0	12
Parks	10	10	20
Circulation	10	12	22
TOTAL	500	522	1,022

The purpose of this report is to assess the impact of the proposed development on air quality on a local and regional scale. The overall project can be considered an "indirect source" of air pollution as defined in the federal Clean Air Act [1] since its primary association with air quality is its inherent attraction for mobile sources, i.e., motor vehicles. Much of the focus of this analysis, therefore, is on the project's ability to generate traffic and the resultant impact on air quality. Air quality impact was evaluated for the years 2005 and 2011 with and without the project.

A project such as this also requires electrical power and solid waste disposal, both of which involve combustion and emissions into the air at offsite locations. These have been addressed in the report.

FIGURE 1
PROJECT LOCATION

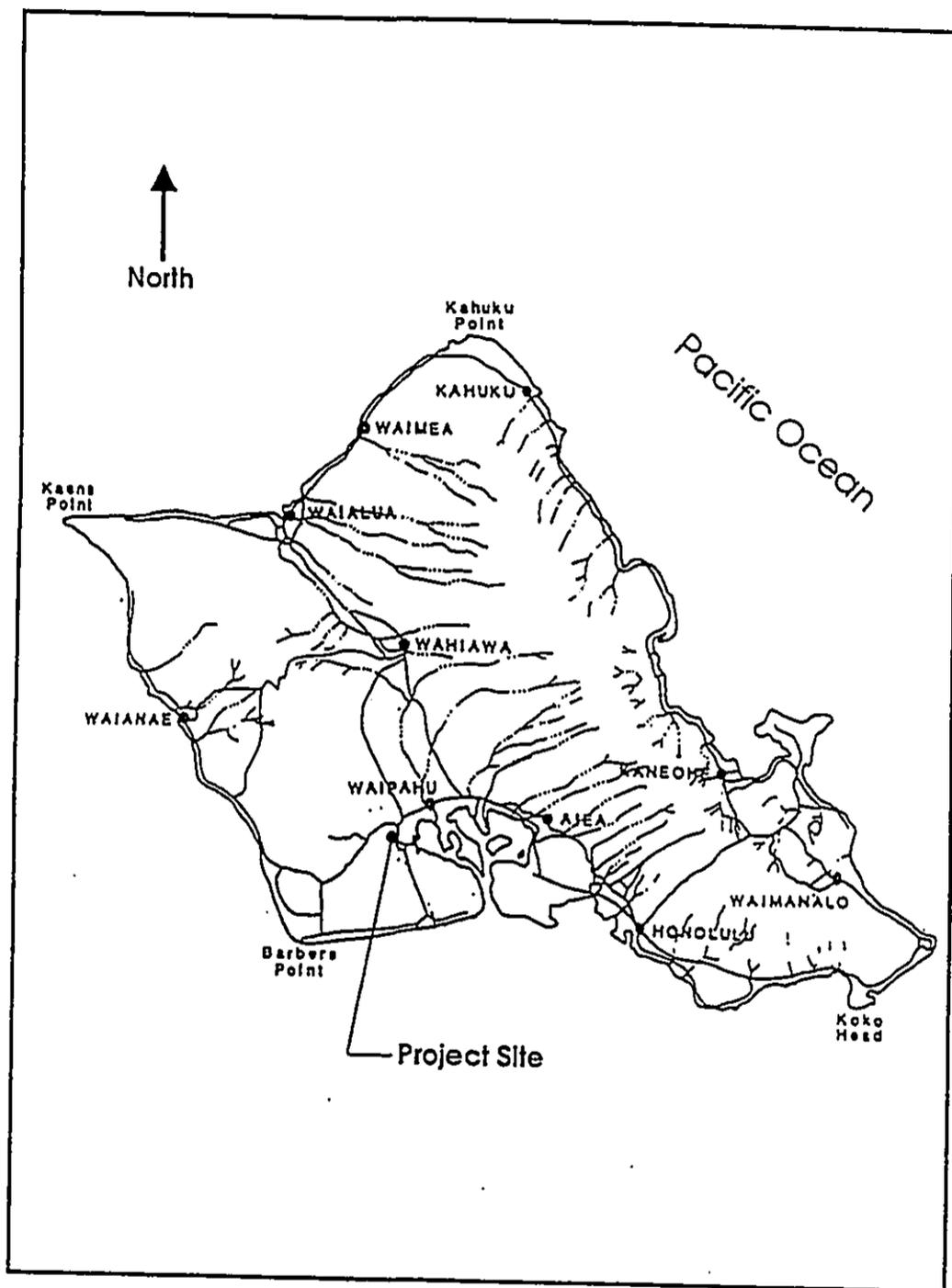


FIGURE 2
EXISTING SITE CONDITIONS
SEPTEMBER 1994

Cane Fields
(facing south)



Farrington Highway
Bordering Property
(facing southwest)

J. W. Morrow

Finally, during construction of the various buildings and facilities air pollutant emissions will be generated onsite and offsite due to vehicular movement, grading, concrete and asphalt batching, and general dust-generating construction activities. These impacts have also been addressed.

2. AIR QUALITY STANDARDS

A summary of State of Hawaii and national ambient air quality standards is presented in Table 2 [2, 3]. Note that Hawaii's standards are not divided into primary and secondary standards as are the federal standards.

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, wildlife, visibility, climate, and economic values [4].

Some of Hawaii's standards (CO, NO₂, and O₃) are clearly more stringent than their federal counterparts but, like their federal counterparts, may be exceeded once per year. It should also be noted that in November 1993, the Governor signed amendments to Chapter 59, Ambient Air Quality Standards [3], adopting the federal standard for particulate matter equal to or less than 10 microns in diameter (PM₁₀). Since measurement data in Hawaii indicate that PM₁₀ comprises about 50% of total suspended particulate matter (TSP), the adoption of that federal standard with a numerical value equal to the original state TSP standard of 150 µg/m³ represents a substantial relaxation of the standard (approximately doubling it).

In the case of the automotive pollutants [carbon monoxide (CO), oxides of nitrogen (NO_x), and photochemical oxidants (Ox)], there are only primary standards. Until 1983, there was also a hydrocarbons standard which was based on the precursor role hydrocarbons play in the formation of photochemical oxidants rather than any unique toxicological effect they had at ambient levels. The hydrocarbons standard was formally eliminated in January, 1983 [5].

The U.S. Environmental Protection Agency (EPA) is mandated by Congress to periodically review and re-evaluate the federal standards in light of new research findings [1]. The last review resulted in the relaxation of the oxidant standard from 160 to 235 micrograms/cubic meter (ug/m³) [6]. The carbon monoxide (CO), particulate matter, sulfur dioxide (SO₂), and nitrogen dioxide (NO₂) standards have been reviewed, but no new standards were proposed.

TABLE 2

SUMMARY OF STATE OF HAWAII AND FEDERAL
AMBIENT AIR QUALITY STANDARDS

POLLUTANT	SAMPLING PERIOD	NAAQS PRIMARY	NAAQS SECONDARY	STATE STANDARDS
PM ₁₀	Annual	50	50	50
	24-hr	150	150	150
SO ₂	Annual	80	---	80
	24-hr	365	---	365
	3-hr	---	1,300	1,300
NO ₂	Annual	100	---	70
CO	8-hr	10	---	5
	1-hr	40	---	10
O ₃	1-hr	235	---	100
H ₂ S	1-hr	---	---	35
Pb	Calendar Quarter	1.5	---	1.5

KEY: TSP - total suspended particulate matter
 PM₁₀ - particulate matter < 10 microns
 SO₂ - sulfur dioxide
 NO₂ - nitrogen dioxide
 CO - carbon monoxide
 O₃ - ozone
 Pb - lead

All concentrations in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)
 except CO which is in milligrams per cubic meter (mg/m^3).

Finally, the State of Hawaii also has fugitive dust regulations for particulate matter (PM) emanating from construction activities [7]. There simply can be no visible emissions from fugitive dust sources.

3. EXISTING AIR QUALITY

3.1 General. The State Department of Health (DOH) maintains a limited network of air monitoring stations around the state to gather data on the following regulated pollutants:

- o particulate matter \leq 10 microns (PM_{10})
- o total suspended particulate matter (TSP)
- o sulfur dioxide (SO_2)
- o carbon monoxide (CO)
- o ozone (O_3)

In the case of PM_{10} and SO_2 , measurements are made on a 24-hour basis to correspond with the averaging period specified in State and Federal standards. Samples are collected once every six days in accordance with U.S. Environmental Protection Agency (EPA) guidelines. Carbon monoxide and ozone, however, are measured on a continuous basis due to their short-term (1-hour) standards. Lead concentrations are determined from the TSP samples which are sent to an EPA laboratory for analysis. It should also be noted that the majority of these pollutants are monitored only in Honolulu.

3.2 Department of Health Monitoring. There are no air monitoring sites in the immediate vicinity of the project site. The nearest stations are at Pearl City and Barbers Point where PM_{10} is measured. A summary of the most recent published data from those sites are presented in Figure 3. Particulate matter levels are well below the $50 \mu g/m^3$ annual and $150 \mu g/m^3$ twenty-four hour standards.

The summary of monitoring results from the Department of Health building in downtown Honolulu presented in Table 3 also indicates compliance with standards. Air quality at the project area should be comparable or perhaps somewhat better given the site's more rural location.

FIGURE 3
MONTHLY PM₁₀ AVERAGES
PEARL CITY AND BARBERS POINT
MONITORING STATIONS
1990

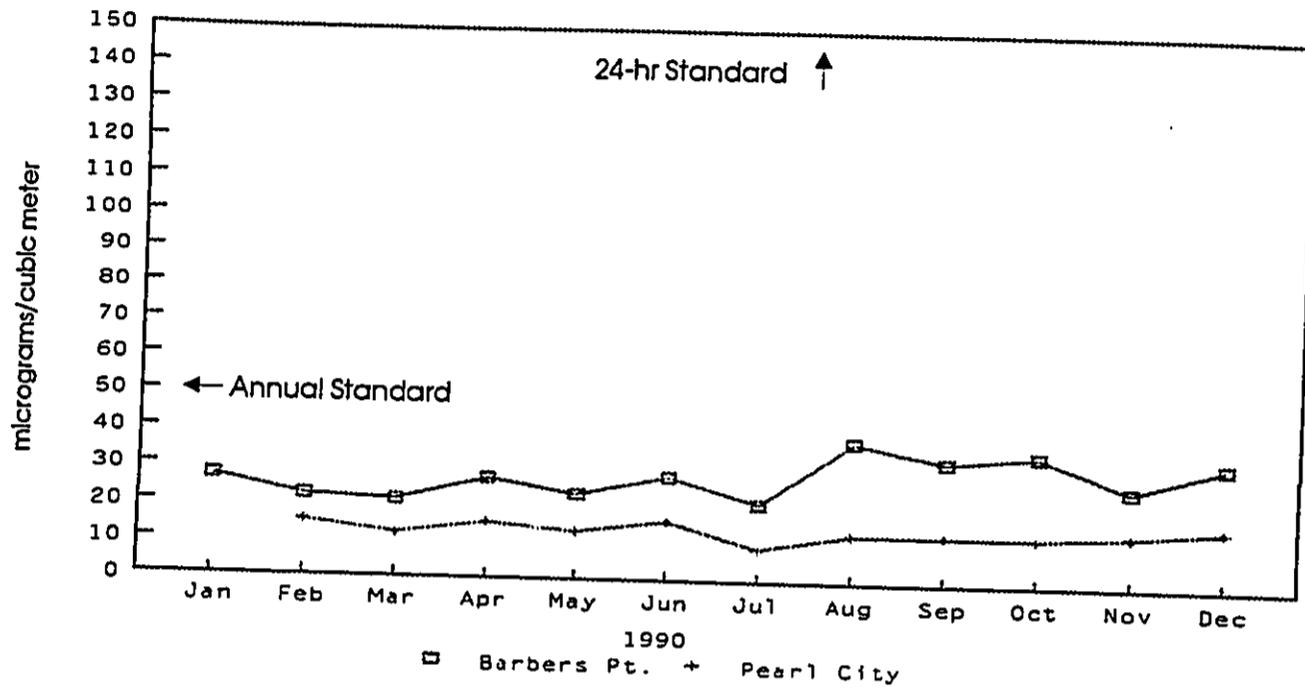


TABLE 3
 AIR MONITORING DATA
 DEPARTMENT OF HEALTH BUILDING¹
 1988 - 1990

POLLUTANT	Concentration ($\mu\text{g}/\text{m}^3$)		
	1988	1989	1990
Total suspended particulate matter (TSP)	15 - 45 26	16 - 48 29	13 - 47 30
Particulate matter < 10 microns (PM_{10})	9 - 25 17	10 - 33 16	8 - 36 15
Sulfur dioxide (SO_2)	<5 - <5 <5	<5 - 8 <5	<5 - <5 <5
Carbon monoxide (CO)	0.2 - 10.3 1.7	0.3 - 9.7 1.9	0.1 - 7.1 1.5
Ozone (O_3)	0 - 92 14	0 - 94 15	4 - 116 36
Lead (Pb)	0 - 0.1 0	0 - 0.1 0	0 - 0 0
Notes: 1. Values indicate range and annual mean. 2. CO values are mg/m^3 . 3. PM_{10} data are from the Liliha site. 4. O_3 data are from the Sand Island site.			

4. CLIMATE AND METEOROLOGY

4.1 Temperature and Rainfall. Temperatures in the project area are expected to be similar to those found elsewhere in Hawaii. The nearest long-term weather station operated by the National Weather Service is located at the Honolulu International Airport. In an annual summary for that station, the National Climatic Center has summarized Honolulu's temperature regime as follows:

Hawaii's equable temperatures are associated with the small seasonal variation in the amount of energy received from the sun and the tempering effect of the surrounding ocean. The range of temperatures averages only 7 degrees between the

warmest months (August and September) and the coolest months (January and February) and about 12 degrees between day and night. Daily maximums run from the high 70's in winter to the mid-80's in summer, and daily minimums from the mid-60's to the low 70's. However, the Honolulu Airport area has recorded as high as 93 degrees and as low as 53 [9].

Historical rainfall data from the Honolulu International Airport indicate an annual average of 23 inches. Based on this average and in accordance with Thornwaite's scheme for climatic classification, the area is considered semi-arid [10].

4.2 Surface Winds. Meteorological data records were reviewed from the nearby Honolulu International Airport and Hickam Air Force Base. The annual prevalence of northeast trade winds is clearly shown in Table 4. A closer examination of the data, however, indicates that low velocities (less than 10 mph) occur frequently and that the "normal" northeasterly trade winds tend to break down in the Fall giving way to more light, variable wind conditions through the Winter and on into early Spring. It is during these times that Honolulu generally experiences elevated pollutant levels. This seasonal difference in wind conditions can be easily contrasted by comparing August and January wind roses (Figures 4 and 5).

Of particular interest from an air pollution standpoint were the stability wind roses prepared for Hickam Air Force Base [11]. These data indicated that stable conditions, i.e., Pasquill-Gifford stability categories E and F [12], occur about 28% of the time on an annual basis and 36% of the time during the peak winter month (January). It is under such conditions that the greatest potential for air pollutant buildup from groundlevel sources, e.g., motor vehicles, exists.

5. SHORT-TERM IMPACTS

5.1 Onsite Impacts. The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the existing roadways as well as on the project site itself. The additional construction vehicle traffic should not exceed street capacities although the presence of large trucks can reduce a roadway's capacity as well as lower average travel speeds.

The site preparation and earth moving will create particulate emissions as will building and onsite road construction. Construction vehicles movement on unpaved on-site roads will also generate particulate emissions. EPA studies on fugitive dust

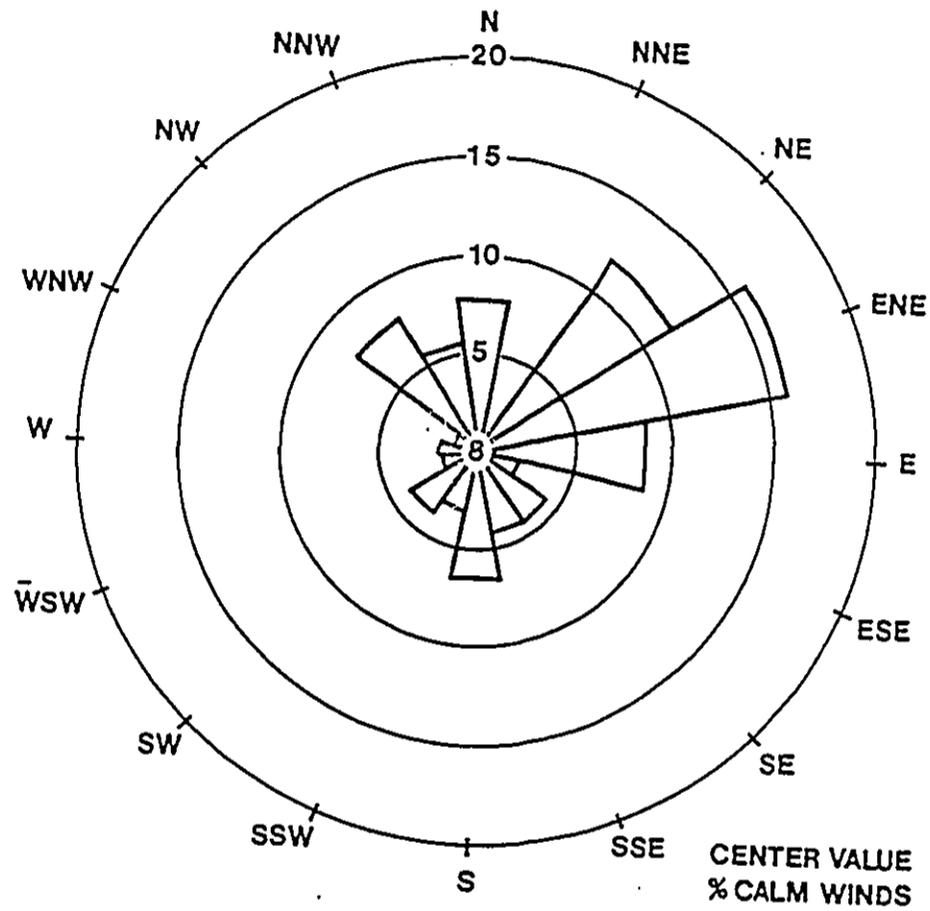
TABLE 4
 ANNUAL JOINT FREQUENCY DISTRIBUTION
 OF WIND SPEED AND DIRECTION
 HONOLULU INTERNATIONAL AIRPORT

Wind Speed (kts)

Dir	0-3	4-7	8-12	13-18	19-24	>24	Total
N	.0149	.0261	.0075	.0020	.0002	.0000	.0506
NNE	.0114	.0219	.0106	.0046	.0005	.0000	.0490
NE	.0114	.0449	.0829	.0853	.0204	.0018	.2466
ENE	.0088	.0637	.1559	.1209	.0224	.0014	.3731
E	.0039	.0179	.0329	.0210	.0023	.0001	.0782
ESE	.0021	.0056	.0050	.0015	.0003	.0001	.0146
SE	.0021	.0059	.0091	.0049	.0006	.0002	.0228
SSE	.0023	.0074	.0123	.0038	.0008	.0002	.0268
S	.0025	.0104	.0127	.0033	.0005	.0003	.0296
SSW	.0011	.0041	.0053	.0017	.0003	.0000	.0125
SW	.0007	.0031	.0058	.0022	.0003	.0001	.0122
WSW	.0006	.0017	.0031	.0022	.0005	.0001	.0082
W	.0019	.0030	.0021	.0009	.0002	.0001	.0082
WNW	.0027	.0051	.0012	.0003	.0001	.0000	.0094
NW	.0084	.0153	.0031	.0008	.0003	.0000	.0279
NNW	.0087	.0166	.0041	.0012	.0002	.0000	.0308
TOT	.0835	.2527	.3534	.2567	.0496	.0043	1.0002

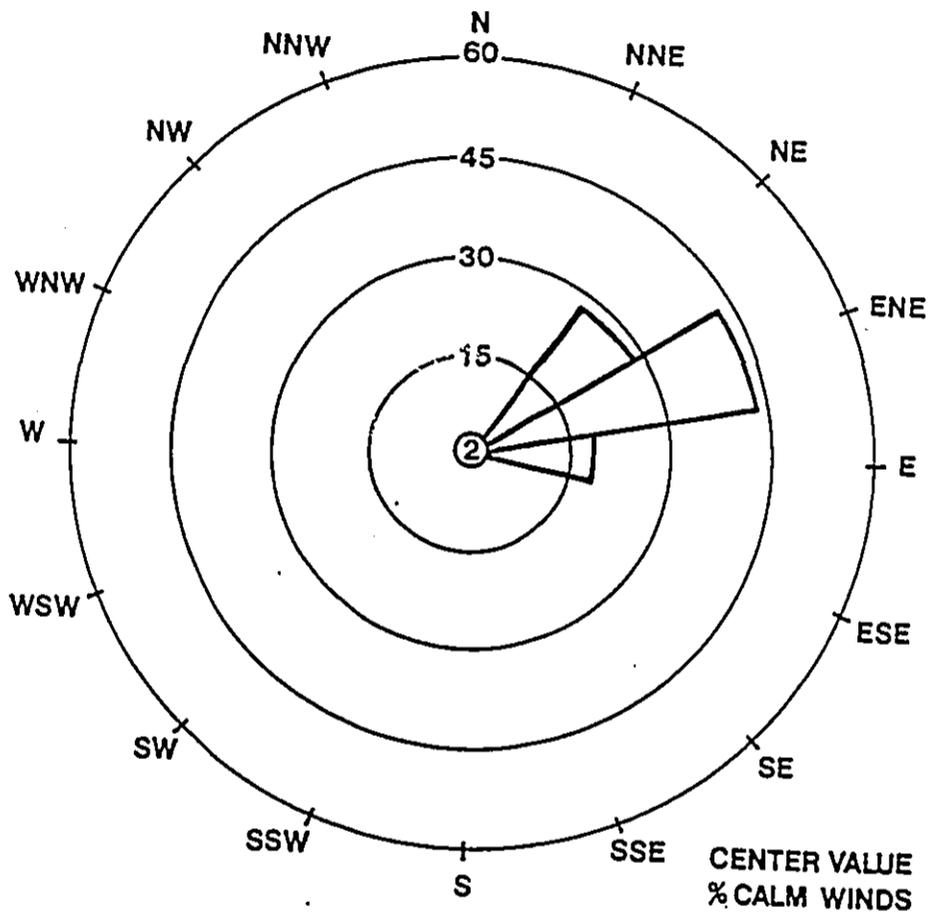
SOURCE: National Weather Service
 Historical Records, 1940-67

FIGURE 4
JANUARY WIND ROSE
HONOLULU INTERNATIONAL AIRPORT



SOURCE: National Weather Service
Historical Records, 1940-67

FIGURE 5
AUGUST WIND ROSE
HONOLULU INTERNATIONAL AIRPORT



SOURCE: National Weather Service
Historical Records, 1940-67

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emissions from construction sites indicate that about 1.2 tons/acre per month of activity may be expected under conditions of medium activity, moderate soil silt content (30%), and a precipitation/evaporation (P/E) index of 50 [10,13].

Onsite soils are high in clay content which suggests silt content of about 30% [14], the same as cited above. In conjunction with the semi-arid local climate (P/E Index 28.9), this suggests a potential for somewhat greater fugitive dust emissions than estimated by the EPA.

5.2 Offsite Impacts. In addition to the onsite impacts attributable to construction activity, there will also be offsite impacts due to the operation of concrete and asphalt batching plants needed for construction. Such plants routinely emit particulate matter and other gaseous pollutants. It is too early, however, to identify the specific facilities that will be providing these materials and thus the discussion of air quality impacts is necessarily generic. The batch plants which will be producing the concrete for foundations, curbing, etc. and the asphalt for roadways must be permitted by the Department of Health Clean Air Branch pursuant to state regulations [7]. In order to obtain these permits they must demonstrate their ability to continuously comply with both emission [7] and ambient air quality [3] standards. Under the recently promulgated federal Title V operating permit requirements [15], now incorporated in Hawaii's rules [7], air pollution sources must regularly attest to their compliance with all applicable requirements.

6. MOBILE SOURCE IMPACTS

6.1 Mobile Source Activity. The traffic assessment prepared for the proposed project served as the basis for this mobile source impact analysis [8]. Traffic projections for 2005 and 2011 with and without the project were provided for the major intersections serving the project area.

6.2 Emission Factors. Automotive emission factors for carbon monoxide (CO) were generated for calendar years 2005 and 2011 using the Mobile Source Emissions Model (MOBILE-5A) [16]. To localize the emission factors as much as possible, the September 1988 age distribution for registered vehicles in the City & County of Honolulu [17] was input in lieu of national statistics. That same age distribution was the basis for the distribution of vehicle miles travelled as well.

6.3 Modeling Methodology. Due to the present state-of-the-art in air quality modeling, analyses such as this generally focus on

estimating concentrations of non-reactive pollutants. For projects involving mobile sources as the principal source, carbon monoxide is normally selected for modeling because it has a relatively long half-life in the atmosphere (ca. 1 month)[18], and it comprises the largest fraction of automotive emissions.

Using the available traffic data, modeling was performed for the following intersections:

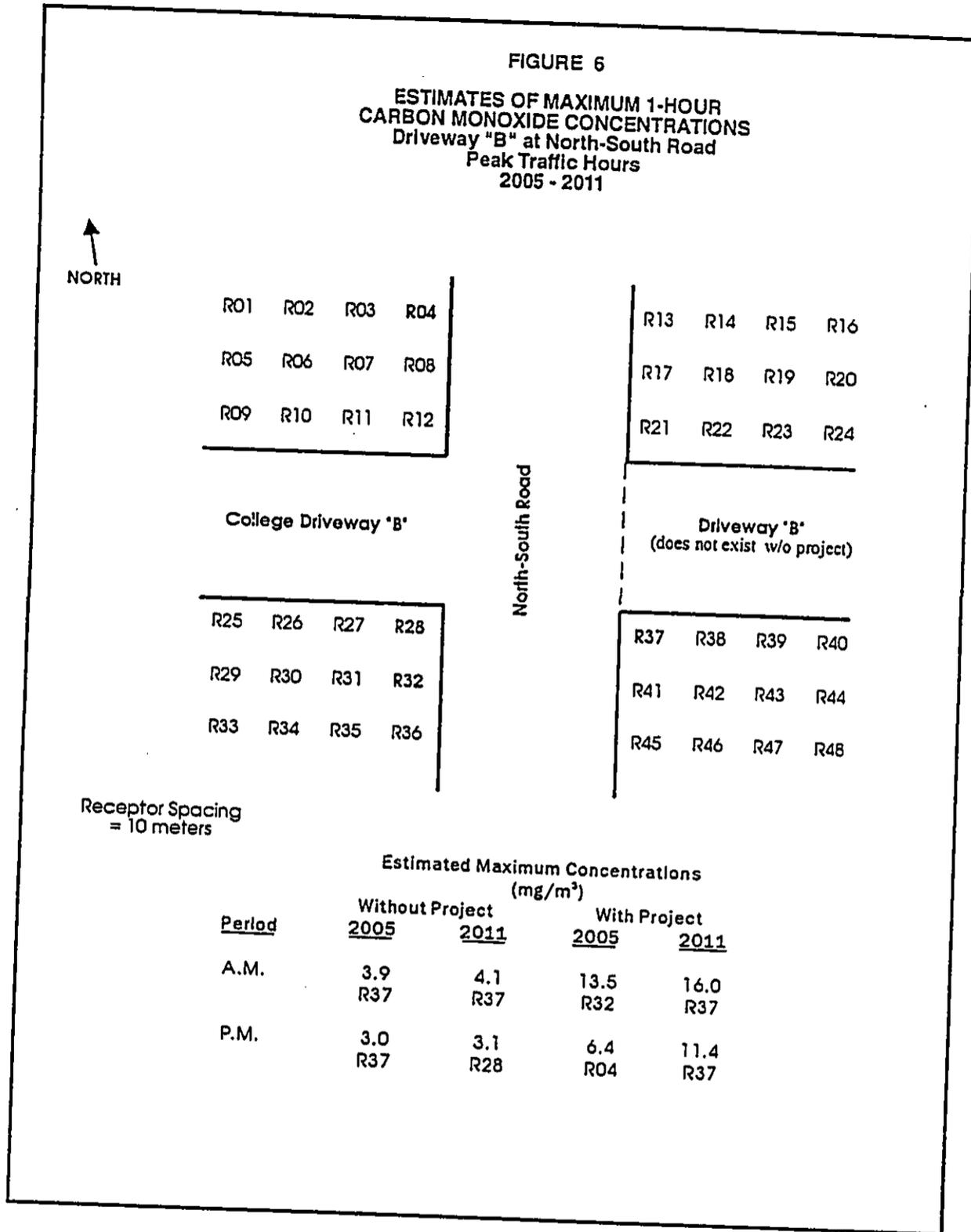
- Driveway "B" @ North-South Road
- Driveway "A" @ North-South Road
- North-South Road @ Farrington Highway
- Driveway "C" @ Farrington Highway

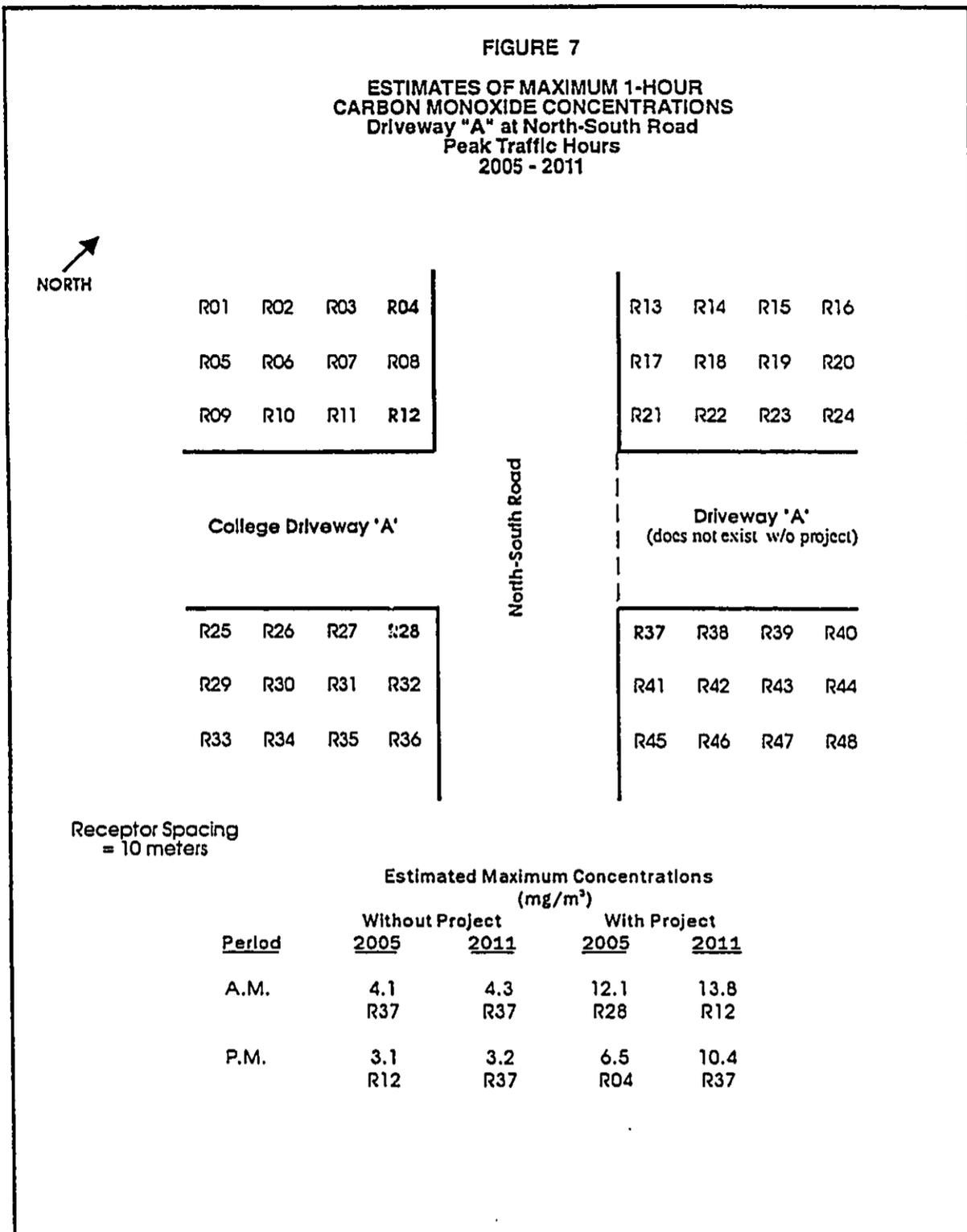
Because of the rural nature of the area, a stable atmosphere (Category "F") [19] was assumed for the morning and a neutral atmosphere (Category "D") for afternoon peak hours. A 1 meter per second (m/sec) wind speed was also assumed as worst case meteorological conditions.

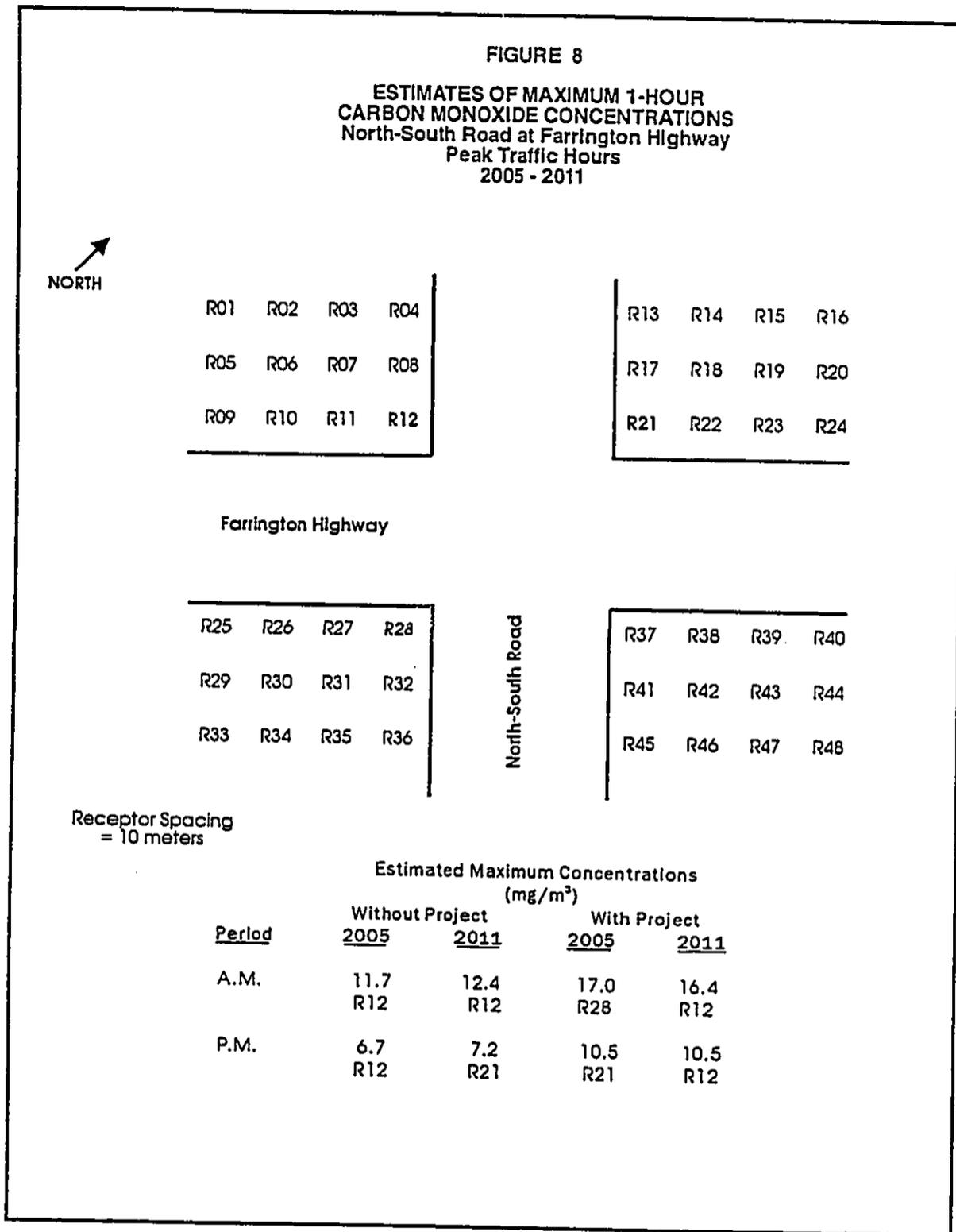
The EPA guideline model CAL3QHC [20,21] was employed to estimate near-intersection carbon monoxide concentrations. An array of 48 receptor sites at distances of 10 meters from the road edge were input to the model. Because the area is urbanizing with an increasing number of streets and traffic, a background CO concentration of 1.0 milligram per cubic meter (mg/m^3) was assumed. The model uses an iterative process to identify the wind direction producing the maximum CO concentration at each receptor location.

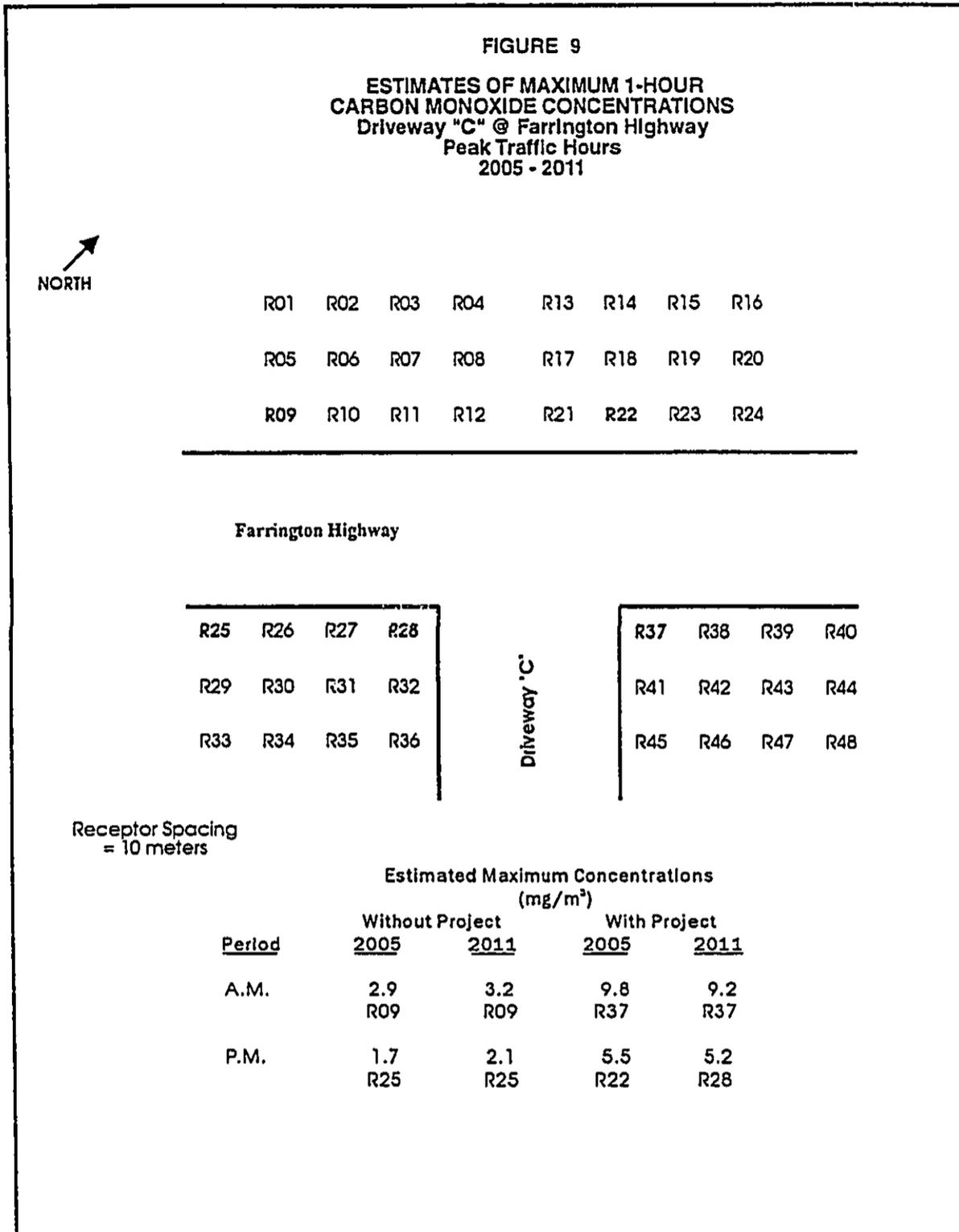
6.4 Results: 1-Hour Concentrations. The results of this modeling are presented in Figures 6 - 9. Each figure depicts the locations of the 48 receptor sites around the respective intersections. Maximum estimated concentrations in milligrams per cubic meter (mg/m^3) for each of the evaluated scenarios are also presented along with the particular receptor location at which they were predicted.

There appears to be some potential for exceedances of the state 1-hour CO standard in close proximity, i.e., within 10 meters, to the intersections along the future North-South Road during both a.m. and p.m. peak traffic hours. In fact, even without the project, exceedances are predicted during the a.m. peak hour at the intersection with Farrington Highway. No exceedances of the federal standard are predicted.









The probability of these exceedances actually occurring, however, is low since the winds (speed and direction) and atmospheric stability conditions necessary to produce them generally occur at an overall frequency less than 1%.

6.5 Results: 8-Hour Concentrations. Estimates of 8-hour concentrations can be derived by applying a "persistence" factor of 0.6 to the 1-hour concentrations. This "persistence" factor has been recommended in an EPA publication on indirect source analysis [22] and has been further corroborated by analysis of carbon monoxide monitoring data in Honolulu which yielded the same 8-hour-to-1-hour ratio [23]. Applying this factor to the maximum 1-hour estimates indicates compliance with the federal 8-hour standard but possible exceedance of the more stringent state standard in close proximity (< 10 meters) to the intersections studied.

Again, since the probability of the estimated maximum 1-hour concentrations is low, the 8-hour values derived from those concentrations would be expected to have an even lower probability given the longer averaging time and the changes in meteorological conditions which normally occur throughout the day.

7. OFFSITE IMPACTS

7.1 Electrical Generation. The estimated 59.6 and 55.9 million kilowatt hours (kwhrs) of annual electrical demand by Phases I and II of the project, respectively, will necessitate the generation of electricity by power plants. Currently, most of Oahu's electrical energy is generated by Hawaiian Electric Company's oil-fired plants at Kahe Point and Waiiau. These units fire low sulfur (0.5%) fuel oil. The estimated emissions resulting from fuel burned to provide the power needed by the project are presented in Table 5.

7.2 Solid Waste Disposal. The refuse generated by the thousands of new residents eventually inhabiting the project area will require disposal. It is expected that most of this material will be reduced in volume by combustion prior to landfilling. Combustion will be accomplished at the existing resource recovery facility (HPOWER) located at the Campbell Industrial Park southwest of the project site. Estimates of annual emissions attributable to the burning of this waste are presented in Table 6.

TABLE 5

ESTIMATES OF ANNUAL EMISSIONS
DUE TO ELECTRICAL GENERATION

Pollutant	Emissions (T/yr)			Percent of 1980 Inventory
	Phase 1	Phase 2	Total	
Sulfur oxides (SOx)	163	153	316	0.6
Nitrogen oxides (SOx)	139	130	169	0.6
Particulate matter (PM)	16.2	15.2	31.4	0.2
Carbon monoxide (CO)	10.4	9.7	20.1	0.1
Total organics (TOC)	2.2	2.0	4.2	<0.1

TABLE 6

ESTIMATES OF ANNUAL EMISSIONS
DUE TO SOLID WASTE COMBUSTION

Pollutant	Emissions (T/yr)			Percent of 1980 Inventory
	Phase 1	Phase 2	Total	
Nitrogen oxides (NOx)	30.3	34.5	64.8	0.16
Carbon monoxide (CO)	26.7	30.5	57.2	<0.1
Sulfur oxides (SOx)	6.2	7.1	13.3	<0.1
Particulate matter (PM)	2.5	2.9	5.4	<0.1
Total hydrocarbons (THC)	1.6	1.8	3.4	<0.1

8. DISCUSSION, CONCLUSIONS AND MITIGATION

8.1 Short-Term Impacts. Since as noted in Section 5, there is a potential for fugitive dust due to the dry climate and fine soils, it will be important for adequate dust control measures to be employed during the construction period. Dust control could be accomplished through frequent watering of unpaved roads and areas of exposed soil. The EPA estimates that twice daily watering can reduce fugitive dust emissions by as much as 50% [13]. The soonest possible landscaping of completed areas will also help.

8.2 Mobile Source Impacts. As noted in Section 6, possible exceedances of state carbon monoxide standards are predicted for 2005 and 2011 with the project. Factors which mitigate against this being a matter of serious concern for the proposed project are:

- the predicted exceedances were found only very close to the intersection (within 10 meters of the roadway) and at only particular receptor locations, not all close-in receptors; beyond that all standards are met.
- the probability of "worst case" conditions occurring and persisting for 1 to 8 hours is low.

8.3 Electrical Generation. The proposed project will increase electrical demand which in turn will cause more fuel to be burned and more pollutants to be emitted into Oahu's air. The estimated emissions represent relatively small increases (< 1%) over the latest available county emissions inventory. Until other nonpolluting means of generating electricity are developed or higher efficiency control technologies are applied, such increases in emissions are inevitable. Electrical demand, fuel consumption, and emissions can be reduced by energy conservation measures such as use of solar water heaters, heat pumps, proper design of buildings to reduce air conditioning needs, etc. For the present and future, the HECO facilities providing the power must demonstrate compliance with all applicable ambient air quality standards and control regulations in order to retain its operating permit.

8.4 Solid Waste Disposal. The proposed project will contribute additional solid waste which must be disposed of. Combustion of this waste to reduce its volume prior to landfilling will result in air emissions amounting to less than 0.5% of the most recent available Oahu emissions inventory. The combustion facility itself must at all times meet state and federal ambient air quality standards as well as emission limitations in its operating permit.

The proposed project can reduce solid waste generation by encouraging recycling of materials and composting of yard waste and other natural organic materials. Recycling and composting could be made an integral part of the project.

4 OCTOBER 1994

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Appendix J

Potable Water Master Plan for the East Kapolei Area
Tom Nance Water Resource Engineering
October 1994

**Potable Water Master Plan
for the
East Kapolei Area**

Prepared for

**Gray Hong Hills & Associates, Inc.
119 Merchant Street - Suite 607
Honolulu, Hawaii 96813**

Prepared by

**Tom Nance Water Resource Engineering
680 Ala Moana Boulevard - Suite 406
Honolulu, Hawaii 96813**

October 1994

THE ESTATE OF JAMES CAMPBELL

October 6, 1994

Mr. Michael G. Angotti
Director of Land Sales
Schuler Homes, Inc.
828 Fort Street Mall, 4th Floor
Honolulu, Hawaii 96813

Dear Mike:

Re: Schuler Ewa Water Master Plan

I am writing this letter to explain Campbell Estate's position regarding the identification of the Ewa Shaft (EP 15 and 16) as the water source for the proposed Schuler Homes project in Ewa. It is important that a copy of this letter be included with the submission of your Water Master Plan to the Land Use Commission and any other governmental agency involved with your project.

As we have discussed, the Estate intends to reserve all water rights with respect to the lands that Schuler intends to acquire from the Estate for this project. These rights include the ownership and operation of the Ewa Shaft which will be a water source for the Estate's activities including on-going agricultural operations upon expiration of the Oahu Sugar Company Ltd. Lease on June 30, 1995.

We have received correspondence from the Board of Water Supply indicating they are interested in owning the Ewa Shaft. Our response to them is "...that the loss of the Ewa Shaft or the water therefrom would cause significant and possible irreparable damage to the Estate. Furthermore, the Estate's loss of use of the Ewa Shaft through eminent domain or regulation, or both, would entitle the Estate to substantial compensation, not only for such loss, but also for loss of value to the Estate's surrounding lands."

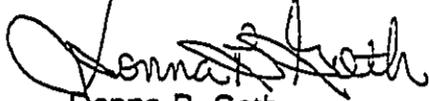
To date, the Estate has received no proposal from the Board of Water Supply which addresses any terms and conditions which would mitigate the Estate's concerns.

We would prefer that you delete any references to the Ewa Shaft as a potential water source. Inasmuch as you desire to provide as much detail as possible in your entitlement applications, your cooperation by including this explanation with your Water Master Plan submissions will help the Estate continue to defend its rights.

Mr. Michael G. Angotti
October 6, 1994
Page 2

I am available to respond to any questions.

Very truly yours,



Donna B. Goth
Director, Hawaii Development

cc: Gray, Hong, Bills & Associates
David B. Bills

Estate of James Campbell
Jan Burns
George Hiu

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- 1 Hydraulic Analysis of the 228-Foot Service Zone
- 2 Hydraulic Analysis of the 440-Foot Service Zone
- 3 Hydraulic Analysis of the 440-Foot Service Zone With Two 5,000 GPM Pumps On

Introduction

This water master plan has been created for the East Kapolei area of Ewa shown on Figure 1. Projects and lands included in the master plan are:

- The East Kapolei Project of Schuler Homes, Inc. consisting of 10,000 residential units and school, park, and commercial sites on 1,022 acres;
- The University of Hawaii's West Oahu Campus on 500 acres;
- An 85-acre high school site;
- Residential development by the Department of Hawaiian Home Lands on 170 acres; and
- Mixed use development on 1,000 acres of Campbell Estate land, generally comprising the mauka and eastern portions of the master planned area.

The master plan establishes storage, transmission, and distribution requirements for all potable system facilities. All of these facilities would be new, stand-alone improvements and are analyzed as such in this Master Plan. However, the plan does not deal directly with sources of supply. A possible source is the shaft known as EP 15 & 16 (State Well No. 2202-21). Oahu Sugar Company's (OSCO) use of the shaft is scheduled to end in June 1995. Other possible sources would be located further east toward Waipahu. The Board of Water Supply will designate the source after allocations are set by the State Commission on Water Resource Management. Although EP 15 & 16 is shown as the source in graphic presentations in this Master Plan, this does not imply that Campbell Estate supports use of EP 15 & 16 for this purpose.

The caprock underlying the makai half to two-thirds of the master plan area is comprised of alluvium and poorly permeable marine calcareous deposits. In the mauka area, it is entirely alluvium. Attempts to develop brackish wells for irrigation supply have shown that the caprock formation here does not have sufficient permeability for successful well development. Based on this, all potential non-potable irrigation sources for the master plan area are offsite. They are: Waiahole Ditch; OSCO basalt aquifer wells in lower Honouliuli (EP 3 & 4, 5 & 6, and 7 & 8, State Nos. 2102-02, -04 to -22, 2202-03 to -14, and 2202-15 to 20, respectively); and polished effluent from the City's Honouliuli Wastewater Treatment Plant. None of these prospective sources are currently available. Issues of ownership, water use allocation, present use by OSCO through June 1995, and required infrastructure development will delay their possible use for a number of years. Accordingly, this master plan assumes that all water supply requirements will be provided by the potable system.

Projected Potable Water Supply Requirements

The master plan area extends from elevations of 25 to 40 feet on its makai and east boundaries to just over 200 feet on the makai side of H-1 Freeway. These elevations span two service pressure zones which will be served from storage tanks with 228- and 440-foot tank spillway elevations. The boundary between the two service zones is shown on Figure 1. Ground elevations are typically 105 to 110 feet along the divide between the service areas.

Tables 1 and 2 provide parcel-by-parcel tabulations of the average, maximum day, and peak water demands within the 228- and 440-foot service zones, respectively. The total supply requirements are as follows:

Service Zone	Average (MGD)	Max. Day (MGD)	Peak (MGD)
228-Foot	5.0000	7.5000	15.0000
440-Foot	7.7360	11.6040	23.2080
Total	12.7360	19.1040	38.2080

Layout of the Proposed Water System

Figure 2 is a layout of proposed water system improvements. For purposes of illustration, EP 15 & 16 is shown as the source of supply. Well pumping capacity of 28.656 MGD (19,900 GPM) would ultimately be required to provide the 19.104 MGD maximum day use in 16 hours for both service zones. The initial phase of development will consist of 500 acres of the Schuler project, all in the 228-foot service zone. Its maximum day supply requirement of 3.5287 MGD would require an initial well pumping capacity of 5.293 MGD (3,675 GPM).

Storage tanks for the 228-foot system would be located on a promontory on the makai side of H-1 Freeway. Figure 3 is a schematic layout of the initial 4 MG and subsequent 3.5 MG tanks that would be located there. Both tanks would have 20-foot working heights, 228-foot spillway elevations, and 208-foot finished floor elevations. Use of this site is predicated on utilizing berms and landscaping so the tank is visually acceptable to Campbell Estate.

Table 1

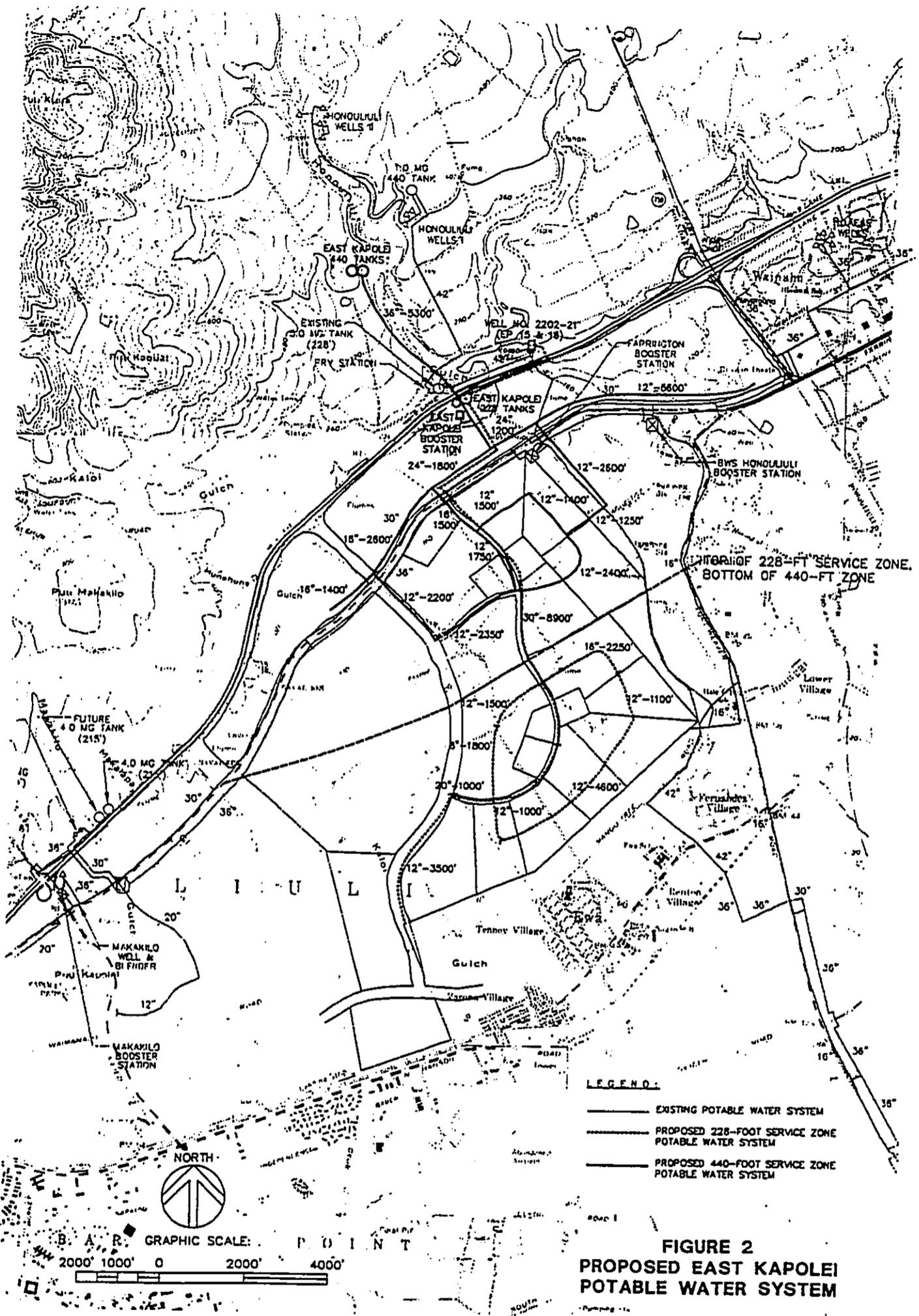
Water Demands for Projects in the 228-Foot Service Zone

Development Parcel	No. of Units	Area (Acres)	Unit Demand (GPD/Unit)	Water Demand Rates (MGD)			Location of Demand on Hydraulic Schematic (Node No. on Figure 4)
				Average Day	Maximum Day	Peak	
Schuler Res 1 - MF	345		400	0.1380	0.2070	0.4140	10
SF	230		500	0.1150	0.1725	0.3450	10
Res 2 - MF	350		400	0.1400	0.2100	0.4200	9
SF	235		500	0.1175	0.1762	0.3525	9
Res 3 - MF	360		400	0.1440	0.2160	0.4320	9
SF	240		500	0.1200	0.1800	0.3600	9
Res 4 - MF	425		400	0.1700	0.2550	0.5100	8
SF	285		500	0.1425	0.2138	0.4275	8
Res 5 - MF	355		400	0.1420	0.2130	0.4260	8
SF	235		500	0.1175	0.1762	0.3525	8
Res 6 - MF	725		400	0.2900	0.4350	0.8700	11
SF	485		500	0.2425	0.3638	0.7275	11
Res 7 - MF	470		400	0.1880	0.2820	0.5640	6
SF	315		500	0.1575	0.2362	0.4725	6
Res 8 - MF	275		400	0.1100	0.1650	0.3300	7
SF	185		500	0.0925	0.1388	0.2775	7
Commerical		10	4,000	0.0400	0.0600	0.1200	2
Park		10	4,000	0.0400	0.0600	0.1200	2
Elem. School		12	4,000	0.0480	0.0720	0.1440	2
High School		85	4,000	0.3400	0.5100	1.0200	4
University (Lower Half)		250	4,000	1.0000	1.5000	3.0000	4
DHHL		170	4,000	0.6800	1.0200	2.0400	5
Campbell Mixed Use (Portion D)		85	5,000	0.4250	0.6375	1.2750	7
Totals	5,515	622	--	5.0000	7.5000	15.0000	--

Table 2

Water Demands for Projects in the 440-Foot Service Zone

Development Parcel	No. of Units	Area (Acres)	Unit Demand (GPD/Unit)	Water Demand Rates (MGD)			Location of Demand on Hydraulic Schematic (Node No. on Figure 4)
				Average Day	Maximum Day	Peak	
Schuler Res 9 - MF	455		400	0.1820	0.2730	0.5460	5 & 6
SF	300		500	0.1500	0.2250	0.4500	5 & 6
Res 10 - MF	400		400	0.1600	0.2400	0.4800	7
SF	265		500	0.1325	0.1988	0.3975	7
Res 11 - MF	495		400	0.1980	0.2970	0.5940	7
SF	330		500	0.1650	0.2475	0.4950	7
Res 12 - MF	340		400	0.1360	0.2040	0.4080	9
SF	225		500	0.1125	0.1688	0.3375	9
Res 13 - MF	395		400	0.1580	0.2370	0.4740	9
SF	265		500	0.1325	0.1987	0.3975	9
Res 14 - MF	610		400	0.2440	0.3660	0.7320	5 & 10
SF	405		500	0.2025	0.3037	0.6075	5 & 10
Park		10	4,000	0.0400	0.0600	0.1200	6
Commercial		10	4,000	0.0400	0.0600	0.1200	6
University (Upper Hall)		250	4,000	1.0000	1.5000	3.0000	4 & 5
Campbell Est. Commercial		27	4,000	0.1080	0.1620	0.3240	2
Mixed Use		180	5,000	0.9000	1.3500	2.7000	4
Mixed Use		520	5,000	2.6000	3.9000	7.8000	2, 12, & 13
Mixed Use		215	5,000	1.0750	1.6125	3.2250	11 & 12
Totals	4,485	1,212	--	7.7360	11.6040	23.2080	--



LEGEND:

- EXISTING POTABLE WATER SYSTEM
- PROPOSED 228-FOOT SERVICE ZONE POTABLE WATER SYSTEM
- PROPOSED 440-FOOT SERVICE ZONE POTABLE WATER SYSTEM

**FIGURE 2
PROPOSED EAST KAPOLEI
POTABLE WATER SYSTEM**

NORTH

B. A. R. GRAPHIC SCALE: POINT

2000' 1000' 0 2000' 4000'

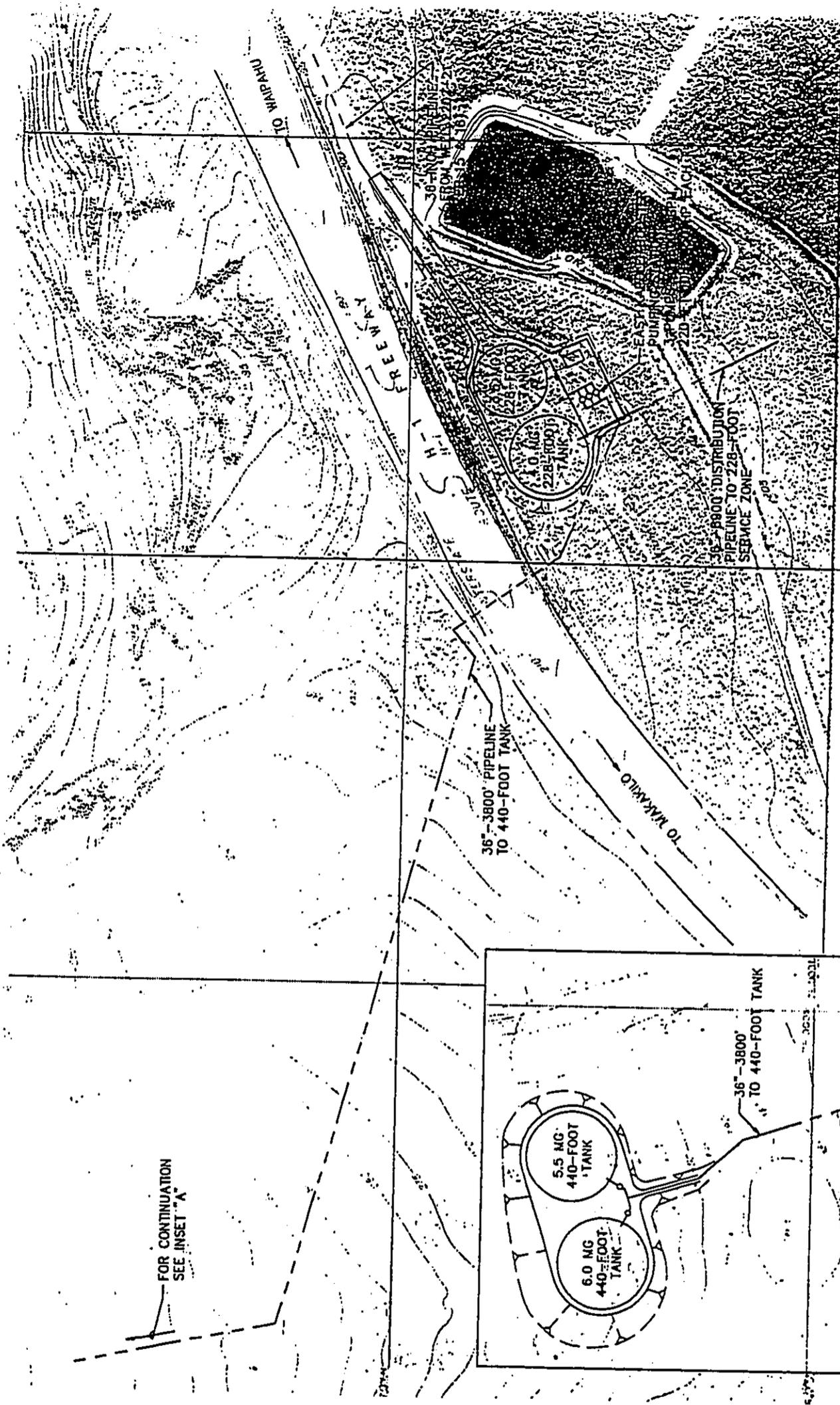
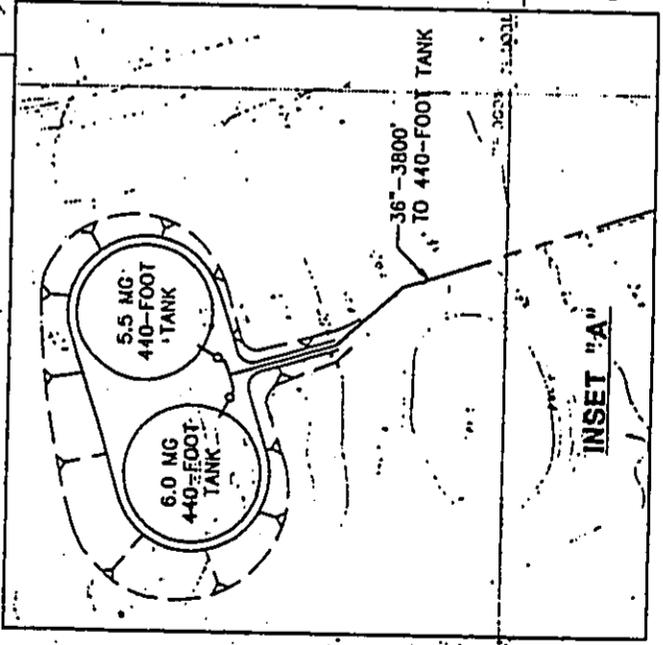
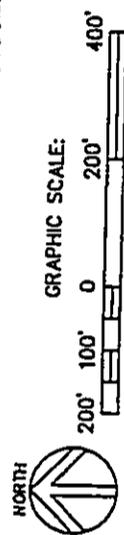


FIGURE 3
LAYOUT OF THE PROPOSED STORAGE TANKS,
TRANSMISSION PIPELINES, AND
BOOSTER PUMPING STATION



Storage for the 440-foot zone would be on the mauka side of the freeway (also shown on Figure 3). The 36-inch connecting transmission-distribution pipeline to the 440-foot tanks would be tunnelled through H-1 Freeway. The alternative to tunneling would be to route the pipeline underneath the Honouliuli Gulch bridge. The substantially greater length of this route would be more costly. Also, the remaining space through the Honouliuli Gulch opening is actually quite limited, particularly if EP 15 & 16 becomes the source of supply. The required ultimate storage capacity of 11.604 in the 440-foot zone would be provided by 6.0 and 5.5 MG tanks. A booster pumping station at the 228-tanks would lift water into the 440-foot tanks. Its ultimate capacity will have to be 17.406 MGD (12,087 GPM). This would be provided by three identical pumps with rated capacities of 6,000 GPM against 220-foot TDH and driven by 450 HP motors.

Except for the North-South Road and a major collector through the Schuler project, the roadway network through the master plan area has not yet been finalized. Portions of the layout of distribution pipelines shown on Figure 2 assume the existence of a road system which the pipelines would follow. When planning of these areas is further refined, the pipeline routes can be adjusted to match the actual roadway pattern.

Hydraulic Analysis of the 228-Foot Service Zone Distribution Pipe Network

The schematic drawing on Figure 4 identifies pipe and node numbers used for the pipe network analyses of the 228-foot service zone. Table 1 identifies the nodes to which water demands of each of the development parcels were assigned. The analysis itself was done with the Kentucky Pipe Network computer program. Exhibit 1 is a printout of its results. All BWS criteria for allowable velocities and minimum pressures during peak and fire flow conditions are met with the pipe sizes chosen. The hydraulic analysis is based on a stand-alone system without interconnections to existing facilities. However, interconnection with the 42-inch, mauka-makai pipeline installed by EPWDC would ultimately be appropriate to provide operational flexibility and backup capacity.

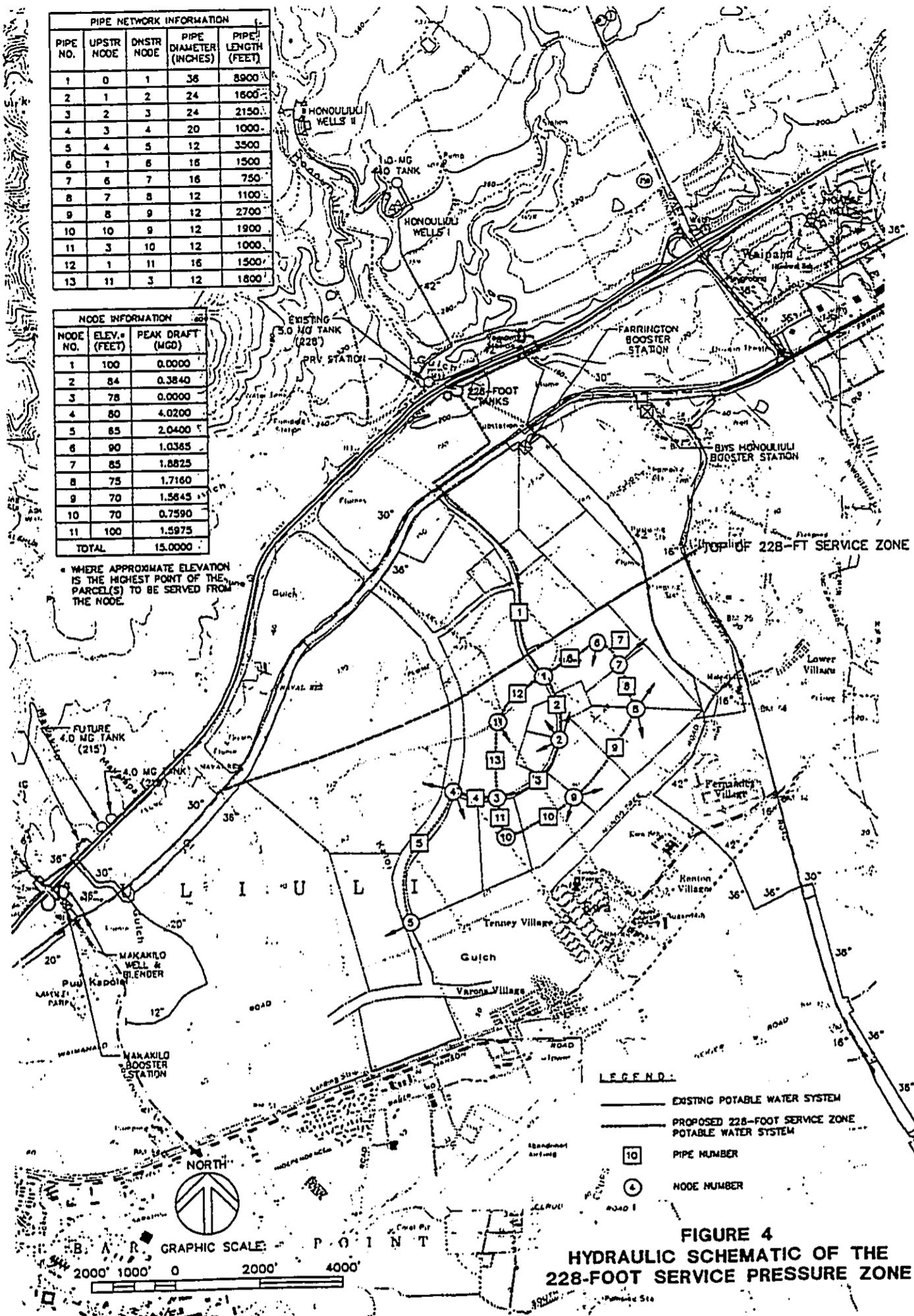
Hydraulic Analysis of the 440-Foot Service Zone Distribution Pipe Network

A schematic depiction of the distribution system for the 440-foot service zone is shown on Figure 5. Assignment of water demands to nodes in the network is indicated on the right-hand side of Table 2. Exhibit 2 is a printout of the computer analysis of the pipe network based on gravity delivery from the 440-foot tank. As with the 228-foot zone, all velocities and residual pressures meet BWS criteria for peak and fire flow conditions.

PIPE NETWORK INFORMATION				
PIPE NO.	UPSTR NOOE	DNSTR NOOE	PIPE DIAMETER (INCHES)	PIPE LENGTH (FEET)
1	0	1	36	8900
2	1	2	24	1600
3	2	3	24	2150
4	3	4	20	1000
5	4	5	12	3500
6	1	6	16	1500
7	6	7	16	750
8	7	8	12	1100
9	8	9	12	2700
10	10	9	12	1900
11	3	10	12	1000
12	1	11	16	1500
13	11	3	12	1600

NODE INFORMATION		
NODE NO.	ELEV. (FEET)	PEAK DRAFT (MGD)
1	100	0.0000
2	84	0.3840
3	78	0.0000
4	80	4.0200
5	85	2.0400
6	90	1.0365
7	85	1.8825
8	75	1.7160
9	70	1.5845
10	70	0.7590
11	100	1.5975
TOTAL		15.0000

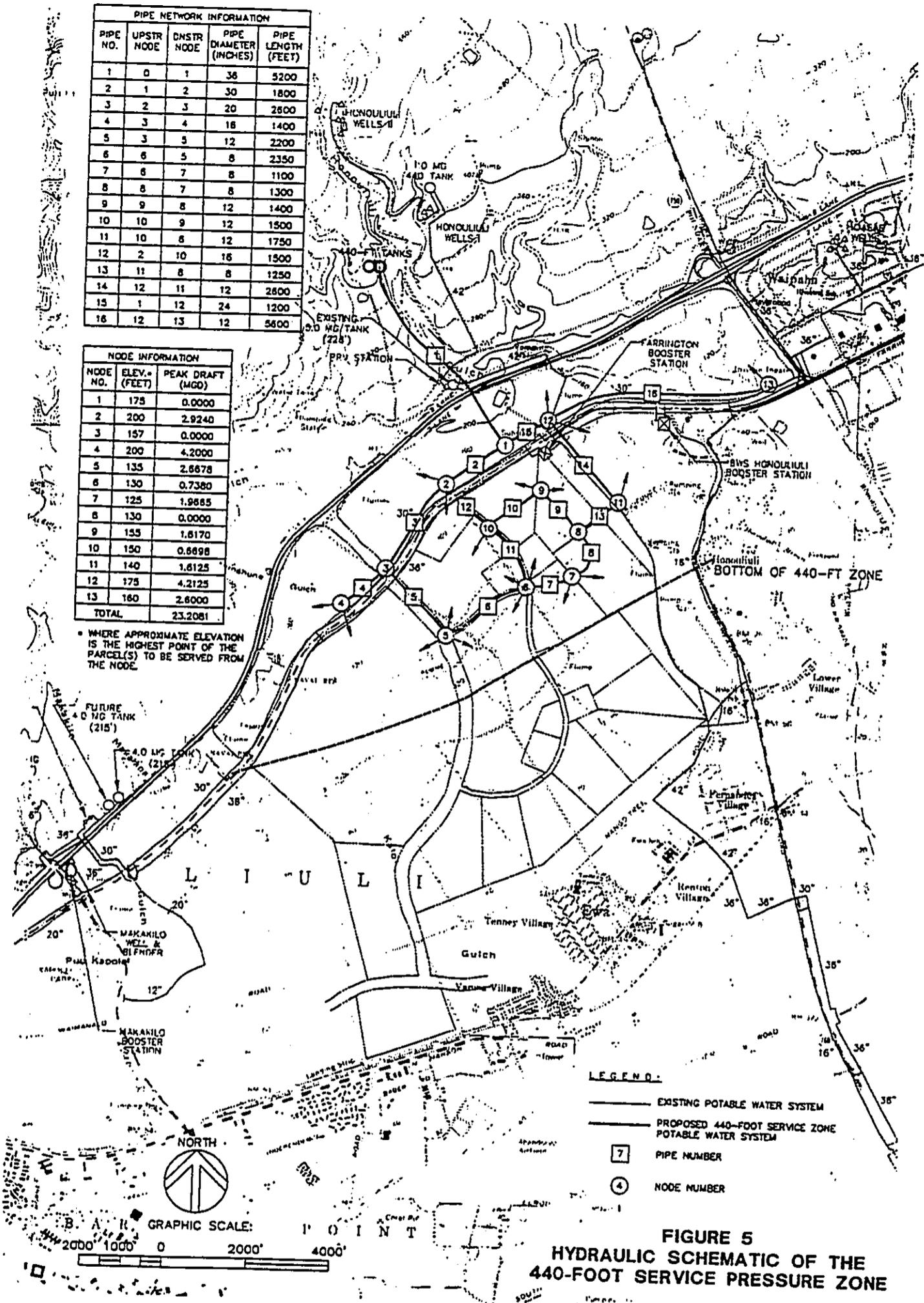
* WHERE APPROXIMATE ELEVATION IS THE HIGHEST POINT OF THE PARCEL(S) TO BE SERVED FROM THE NODE.



PIPE NETWORK INFORMATION				
PIPE NO.	UPSTR NODE	DNSTR NODE	PIPE DIAMETER (INCHES)	PIPE LENGTH (FEET)
1	0	1	36	5200
2	1	2	30	1800
3	2	3	20	2500
4	3	4	18	1400
5	3	5	12	2200
6	6	5	8	2350
7	6	7	8	1100
8	8	7	8	1300
9	9	8	12	1400
10	10	9	12	1500
11	10	8	12	1750
12	2	10	16	1500
13	11	8	8	1250
14	12	11	12	2500
15	1	12	24	1200
16	12	13	12	5600

NODE INFORMATION		
NODE NO.	ELEV. (FEET)	PEAK DRAFT (MGD)
1	175	0.0000
2	200	2.9240
3	157	0.0000
4	200	4.2000
5	135	2.6678
6	130	0.7380
7	125	1.9685
8	130	0.0000
9	155	1.6170
10	150	0.6698
11	140	1.6125
12	175	4.2125
13	160	2.6000
TOTAL		23.2081

* WHERE APPROXIMATE ELEVATION IS THE HIGHEST POINT OF THE PARCEL(S) TO BE SERVED FROM THE NODE.



LEGEND:
 — EXISTING POTABLE WATER SYSTEM
 - - - PROPOSED 440-FOOT SERVICE ZONE POTABLE WATER SYSTEM
 7 PIPE NUMBER
 4 NODE NUMBER

**FIGURE 5
 HYDRAULIC SCHEMATIC OF THE
 440-FOOT SERVICE PRESSURE ZONE**

Exhibit 3 is a hydraulic analysis of the 440-foot service zone with the booster pumps operating (two of the three proposed pumps on and producing approximately 10,000 GPM). To accommodate the booster pumps for this analysis, a node was added at the booster station (node No. 14), pipe No. 1 was divided into two pipe sections (Nos. 1 and 17), and another pipe was added to connect the booster pumps and the 228-foot tanks to the 440-foot system at node No. 14 (pipe No. 18). As might be expected, most pressures throughout the system are slightly higher when the booster pumps are on than during gravity delivery from the 440-foot tank.

Exhibit 1
Hydraulic Analysis of the
228-Foot Service Zone

*** UNIVERSITY OF KENTUCKY PIPE NETWORK ANALYSIS PROGRAM - 1985 VERSION ***
RESULTS TO OUTPUT FILE

INPUT DATA FILE NAME FOR THIS SIMULATION = EKLR.DAT
OUTPUT DATA FILE NAME FOR THIS SIMULATION = EKLR.OUT

NUMBER OF PIPES = 13
NUMBER OF JUNCTION NODES = 11
FLOW UNITS = MILLION GALLONS / DAY
PRESSURE UNITS = PSI

**** SUMMARY OF INPUT DATA ****

PIPE NO.	NODE #1	NODE #2	LENGTH (FT.)	DIAM. (IN.)	HW-C VALUE	SUM-M FACT.	PUMP TYPE	FGN GRADE
1	0	1	8900.0	36.0	130.0	0.0	0.0	223.0
2	1	2	1600.0	24.0	130.0	0.0	0.0	
3	2	3	2150.0	24.0	130.0	0.0	0.0	
4	3	4	1000.0	20.0	120.0	0.0	0.0	
5	4	5	3500.0	12.0	110.0	0.0	0.0	
6	1	6	1500.0	16.0	120.0	0.0	0.0	
7	6	7	750.0	16.0	120.0	0.0	0.0	
8	7	8	1100.0	12.0	110.0	0.0	0.0	
9	8	9	2700.0	12.0	110.0	0.0	0.0	
10	10	9	1900.0	12.0	110.0	0.0	0.0	
11	3	10	1000.0	12.0	110.0	0.0	0.0	
12	1	11	1500.0	16.0	120.0	0.0	0.0	
13	11	3	1800.0	12.0	110.0	0.0	0.0	

JUNCT. NO.	DEMAND	ELEVATION
1	0.0	100.0
2	0.4	95.0
3	0.0	78.0
4	4.0	110.0
5	2.0	80.0
6	1.0	105.0
7	1.9	100.0
8	1.7	90.0
9	1.6	85.0
10	0.8	75.0
11	1.6	115.0

Peak Flowrate

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 5 - ACCURACY ATTAINED = .0009

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL
1	0	1	15.00	8.22	0.00	0.00	3.28	1000
2	1	2	7.56	2.99	0.00	0.00	3.72	0.92
3	2	3	7.17	3.65	0.00	0.00	3.53	1.87
4	3	4	6.06	3.50	0.00	0.00	4.30	1.70
5	4	5	2.04	23.05	0.00	0.00	4.02	3.50
6	1	6	4.82	10.17	0.00	0.00	4.02	6.59
7	6	7	3.78	3.25	0.00	0.00	5.34	6.78
8	7	8	1.90	6.33	0.00	0.00	4.19	4.33
9	8	9	0.18	0.20	0.00	0.00	3.74	5.76
							0.36	0.07

10	10	9	1.38	6.10	0.00	0.00	2.73	3.21
11	3	10	2.14	7.21	0.00	0.00	4.22	7.21
12	1	11	2.63	3.31	0.00	0.00	2.91	2.20
13	11	3	1.03	3.33	0.00	0.00	2.03	1.85

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	100.0	0.0	49.7	214.8
2	95.0	0.4	50.6	211.8
3	78.0	0.0	56.4	208.1
4	110.0	4.0	41.0	204.6
5	80.0	2.0	44.0	181.6
6	105.0	1.0	43.2	204.6
7	100.0	1.9	43.9	201.4
8	90.0	1.7	45.5	195.0
9	85.0	1.6	47.6	194.8
10	75.0	0.8	54.6	200.9
11	115.0	1.6	41.8	211.5

THE NET SYSTEM DEMAND = 15
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 15.00

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO. DEMAND
GLOBAL DEMAND FACTOR = .5
4 4.89

Max. Day Plus 2,000 GPM Fire Flow at Node 4
--

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 3 - ACCURACY ATTAINED = 0

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	10.38	4.16	0.00	0.00	2.27	0.47
2	1	2	6.05	1.98	0.00	0.00	2.98	1.24
3	2	3	5.86	2.51	0.00	0.00	2.89	1.17
4	3	4	5.91	3.34	0.00	0.00	4.19	3.34
5	4	5	1.02	6.39	0.00	0.00	2.01	1.82
6	1	6	2.57	3.18	0.00	0.00	2.85	2.12
7	6	7	2.05	1.05	0.00	0.00	2.28	1.40
8	7	8	1.11	2.36	0.00	0.00	2.19	2.15
9	8	9	0.26	0.38	0.00	0.00	0.50	0.14
10	10	9	0.53	1.02	0.00	0.00	1.04	0.54
11	3	10	0.91	1.47	0.00	0.00	1.79	1.47
12	1	11	1.76	1.57	0.00	0.00	1.95	1.05
13	11	3	0.96	2.92	0.00	0.00	1.89	1.62

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	100.0	0.0	51.5	218.8
2	95.0	0.2	52.8	216.9
3	78.0	0.0	59.1	214.4
4	110.0	4.9	43.8	211.0
5	80.0	1.0	54.0	204.6
6	105.0	0.5	48.0	215.7
7	100.0	0.9	49.7	214.6

8	90.0	0.9	53.0	212.2
9	85.0	0.8	55.0	211.9
10	75.0	0.4	59.8	212.9
11	115.0	0.8	44.3	217.3

THE NET SYSTEM DEMAND = 10.38
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 10.38

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO. DEMAND
GLOBAL DEMAND FACTOR = .5
6 3.39825
4 2.01

Max. Day Plus 2,000 GPM
Fire Flow at Node 6

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 4 - ACCURACY ATTAINED = .0016

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	10.38	4.16	0.00	0.00	2.27	0.47
2	1	2	4.17	0.99	0.00	0.00	2.05	0.62
3	2	3	3.97	1.22	0.00	0.00	1.96	0.57
4	3	4	3.03	0.97	0.00	0.00	2.15	0.97
5	4	5	1.02	6.39	0.00	0.00	2.01	1.82
6	1	6	4.82	10.20	0.00	0.00	5.35	6.80
7	6	7	1.43	0.53	0.00	0.00	1.58	0.71
8	7	8	0.48	0.51	0.00	0.00	0.95	0.46
9	8	9	-0.37	0.77	0.00	0.00	0.74	0.28
10	10	9	1.16	4.37	0.00	0.00	2.28	2.30
11	3	10	1.54	3.89	0.00	0.00	3.02	3.89
12	1	11	1.39	1.02	0.00	0.00	1.54	0.68
13	11	3	0.59	1.20	0.00	0.00	1.16	0.66

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	100.0	0.0	51.5	218.8
2	95.0	0.2	53.2	217.9
3	78.0	0.0	60.1	216.6
4	110.0	2.0	45.8	215.7
5	80.0	1.0	56.0	209.3
6	105.0	3.4	44.9	208.6
7	100.0	0.9	46.8	208.1
8	90.0	0.9	51.0	207.6
9	85.0	0.8	53.5	208.4
10	75.0	0.4	59.7	212.7
11	115.0	0.8	44.6	217.8

THE NET SYSTEM DEMAND = 10.38
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 10.38

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO. DEMAND
 GLOBAL DEMAND FACTOR = .5
 11 3.67875
 4 2.01
 6 .51825

Max. Day Plus 2,000 GPM
 Fire Flow at Node 11

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 4 - ACCURACY ATTAINED = .0001

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	10.38	4.16	0.00	0.00	2.27	0.47
2	1	2	4.86	1.32	0.00	0.00	2.39	0.82
3	2	3	4.67	1.65	0.00	0.00	2.30	0.77
4	3	4	3.03	0.97	0.00	0.00	2.15	0.97
5	4	5	1.02	6.39	0.00	0.00	2.01	1.82
6	1	6	2.48	2.97	0.00	0.00	2.75	1.98
7	6	7	1.96	0.96	0.00	0.00	2.17	1.28
8	7	8	1.02	2.01	0.00	0.00	2.01	1.82
9	8	9	0.16	0.16	0.00	0.00	0.32	0.06
10	10	9	0.62	1.38	0.00	0.00	1.22	0.73
11	3	10	1.00	1.76	0.00	0.00	1.97	1.76
12	1	11	3.04	4.34	0.00	0.00	3.37	2.89
13	11	3	-0.64	1.37	0.00	0.00	1.26	0.76

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	100.0	0.0	51.5	218.8
2	95.0	0.2	53.1	217.5
3	78.0	0.0	59.7	215.9
4	110.0	2.0	45.5	214.9
5	80.0	1.0	55.7	208.5
6	105.0	0.5	48.0	215.9
7	100.0	0.9	49.8	214.9
8	90.0	0.9	53.3	212.9
9	85.0	0.8	55.4	212.7
10	75.0	0.4	60.3	214.1
11	115.0	3.7	43.1	214.5

THE NET SYSTEM DEMAND = 10.38
 SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
 PIPE NO. FLOW
 1 10.38

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO. DEMAND
 GLOBAL DEMAND FACTOR = .5
 5 3.9
 4 2.01
 6 .51825
 11 .79875

Max. Day Plus 2,000 GPM
 Fire Flow at Node 5

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 4 - ACCURACY ATTAINED = 0

PIPE	NODE	NODE	FLOW	HEAD	MINOR	PUMP	LINE	HL
------	------	------	------	------	-------	------	------	----

NO.	#1	#2	RATE	LOSS	LOSS	HEAD	VELOCITY	1000
1	0	1	10.38	4.16	0.00	0.00	2.27	0.47
2	1	2	6.05	1.98	0.00	0.00	2.98	1.24
3	2	3	5.86	2.51	0.00	0.00	2.89	1.17
4	3	4	5.91	3.34	0.00	0.00	4.19	3.34
5	4	5	3.90	76.55	0.00	0.00	7.68	21.87
6	1	6	2.57	3.18	0.00	0.00	2.85	2.12
7	6	7	2.05	1.05	0.00	0.00	2.28	1.40
8	7	8	1.11	2.36	0.00	0.00	2.19	2.15
9	8	9	0.26	0.38	0.00	0.00	0.50	0.14
10	10	9	0.53	1.02	0.00	0.00	1.04	0.54
11	3	10	0.91	1.47	0.00	0.00	1.79	1.47
12	1	11	1.76	1.57	0.00	0.00	1.95	1.05
13	11	3	0.96	2.92	0.00	0.00	1.89	1.62

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	100.0	0.0	51.5	218.8
2	95.0	0.2	52.8	216.9
3	78.0	0.0	59.1	214.4
4	110.0	2.0	43.8	211.0
5	80.0	3.9	23.6	134.5
6	105.0	0.5	48.0	215.7
7	100.0	0.9	49.7	214.6
8	90.0	0.9	53.0	212.2
9	85.0	0.8	55.0	211.9
10	75.0	0.4	59.8	212.9
11	115.0	0.8	44.3	217.3

THE NET SYSTEM DEMAND = 10.38
SUMMARY OF INFLOWS(+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 10.38

***** END OF THIS SIMULATION *****

Exhibit 2
Hydraulic Analysis of the
440-Foot Service Zone

*** UNIVERSITY OF KENTUCKY PIPE NETWORK ANALYSIS PROGRAM - 1985 VERSION ***
 RESULTS TO OUTPUT FILE

INPUT DATA FILE NAME FOR THIS SIMULATION = EKUR.DAT
 OUTPUT DATA FILE NAME FOR THIS SIMULATION = EKUR.OUT

NUMBER OF PIPES = 16
 NUMBER OF JUNCTION NODES = 13
 FLOW UNITS = MILLION GALLONS / DAY
 PRESSURE UNITS = PSI

**** SUMMARY OF INPUT DATA ****

PIPE NO.	NODE #1	NODE #2	LENGTH (FT.)	DIAM. (IN.)	HW-C VALUE	SUM-M FACT.	PUMP TYPE	FGN GRADE
1	0	1	5300.0	36.0	130.0	0.0	0.0	435.0
2	1	2	1800.0	30.0	130.0	0.0	0.0	
3	2	3	2600.0	20.0	120.0	0.0	0.0	
4	3	4	1400.0	16.0	120.0	0.0	0.0	
5	3	5	2200.0	12.0	110.0	0.0	0.0	
6	6	5	2350.0	8.0	110.0	0.0	0.0	
7	6	7	1100.0	8.0	110.0	0.0	0.0	
8	8	7	1300.0	8.0	110.0	0.0	0.0	
9	9	8	1400.0	8.0	110.0	0.0	0.0	
10	10	9	1500.0	12.0	110.0	0.0	0.0	
11	10	6	1750.0	12.0	110.0	0.0	0.0	
12	2	10	1500.0	16.0	120.0	0.0	0.0	
13	11	8	1250.0	8.0	110.0	0.0	0.0	
14	12	11	2600.0	12.0	110.0	0.0	0.0	
15	1	12	1200.0	24.0	130.0	0.0	0.0	
16	12	13	5600.0	12.0	110.0	0.0	0.0	

JUNCT. NO.	DEMAND	ELEVATION
1	0.0	175.0
2	2.9	200.0
3	0.0	157.0
4	4.2	200.0
5	2.7	155.0
6	0.7	135.0
7	2.0	135.0
8	0.0	130.0
9	1.6	175.0
10	0.7	155.0
11	1.6	175.0
12	4.2	200.0
13	2.6	165.0

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

Peak Flowrate

NO. OF TRIALS = 3 - ACCURACY ATTAINED = .0002

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	23.21	10.98	0.00	0.00	5.08	2.07
2	1	2	14.25	3.67	0.00	0.00	4.49	2.04
3	2	3	6.48	10.30	0.00	0.00	4.60	3.96
4	3	4	4.20	7.36	0.00	0.00	4.65	5.26

5	3	5	2.28	17.83	0.00	0.00	4.49	8.10
6	6	5	0.39	5.11	0.00	0.00	1.71	2.17
7	6	7	1.03	14.74	0.00	0.00	4.57	13.40
8	8	7	0.94	14.56	0.00	0.00	4.15	11.20
9	9	8	0.40	3.26	0.00	0.00	1.78	2.33
10	10	9	2.02	9.68	0.00	0.00	3.97	6.45
11	10	6	2.15	12.76	0.00	0.00	4.24	7.29
12	2	10	4.84	10.27	0.00	0.00	5.37	6.85
13	11	8	0.54	4.97	0.00	0.00	2.37	3.98
14	12	11	2.15	18.83	0.00	0.00	4.23	7.24
15	1	12	8.96	3.07	0.00	0.00	4.41	2.56
16	12	13	2.60	57.80	0.00	0.00	5.12	10.32

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	107.9	424.0
2	200.0	2.9	95.5	420.3
3	157.0	0.0	109.7	410.0
4	200.0	4.2	87.8	402.7
5	155.0	2.7	102.8	392.2
6	135.0	0.7	113.7	397.3
7	135.0	2.0	107.3	382.6
8	130.0	0.0	115.8	397.1
9	175.0	1.6	97.7	400.4
10	155.0	0.7	110.5	410.1
11	175.0	1.6	98.4	402.1
12	200.0	4.2	95.7	420.9
13	165.0	2.6	85.9	363.1

THE NET SYSTEM DEMAND = 23.208
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 23.21

THE FOLLOWING CHANGES ARE MADE

Max. Day Plus 2,000 GPM Fire Flow at Node 4
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JUNCT. NO. DEMAND
GLOBAL DEMAND FACTOR = .5
4 4.98

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 3 - ACCURACY ATTAINED = .0023

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	14.48	4.59	0.00	0.00	3.17	0.87
2	1	2	9.95	1.89	0.00	0.00	3.14	1.05
3	2	3	5.94	8.77	0.00	0.00	4.21	3.37
4	3	4	4.98	10.10	0.00	0.00	5.52	7.21
5	3	5	0.96	3.60	0.00	0.00	1.89	1.64
6	6	5	0.37	4.78	0.00	0.00	1.65	2.03
7	6	7	0.48	3.57	0.00	0.00	2.13	3.25
8	8	7	0.50	4.62	0.00	0.00	2.23	3.56
9	9	8	0.19	0.79	0.00	0.00	0.83	0.56
10	10	9	0.99	2.61	0.00	0.00	1.96	1.74
11	10	6	1.22	4.46	0.00	0.00	2.41	2.55
12	2	10	2.55	3.13	0.00	0.00	2.83	2.09
13	11	8	0.32	1.89	0.00	0.00	1.41	1.51

14	12	11	1.12	5.67	0.00	0.00	2.21	2.18
15	1	12	4.53	0.87	0.00	0.00	2.23	0.72
16	12	13	1.30	16.01	0.00	0.00	2.56	2.86

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	110.7	430.4
2	200.0	1.5	99.0	428.5
3	157.0	0.0	113.9	419.8
4	200.0	5.0	90.9	409.7
5	155.0	1.3	113.2	416.2
6	135.0	0.4	123.9	420.9
7	135.0	1.0	122.4	417.4
8	130.0	0.0	126.5	422.0
9	175.0	0.8	107.4	422.8
10	155.0	0.3	117.2	425.4
11	175.0	0.8	107.8	423.9
12	200.0	2.1	99.5	429.5
13	165.0	1.3	107.7	413.5

THE NET SYSTEM DEMAND = 14.484
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 14.48

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO. DEMAND
GLOBAL DEMAND FACTOR = .5
2 4.342
4 2.1

Max. Day Plus 2,000 GPM Fire Flow at Node 2
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**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 3 - ACCURACY ATTAINED = .0001

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	14.48	4.59	0.00	0.00	3.17	0.87
2	1	2	9.98	1.90	0.00	0.00	3.14	1.05
3	2	3	3.24	2.85	0.00	0.00	2.30	1.10
4	3	4	2.10	2.04	0.00	0.00	2.33	1.46
5	3	5	1.14	4.91	0.00	0.00	2.24	2.23
6	6	5	0.20	1.46	0.00	0.00	0.87	0.62
7	6	7	0.51	3.97	0.00	0.00	2.25	3.61
8	8	7	0.48	4.16	0.00	0.00	2.11	3.20
9	9	8	0.18	0.74	0.00	0.00	0.80	0.53
10	10	9	0.99	2.58	0.00	0.00	1.95	1.72
11	10	6	1.07	3.51	0.00	0.00	2.11	2.00
12	2	10	2.40	2.79	0.00	0.00	2.65	1.86
13	11	8	0.30	1.66	0.00	0.00	1.31	1.33
14	12	11	1.10	5.48	0.00	0.00	2.17	2.11
15	1	12	4.51	0.86	0.00	0.00	2.22	0.72
16	12	13	1.30	16.01	0.00	0.00	2.56	2.86

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	110.7	430.4
2	200.0	4.3	99.0	428.5

3	157.0	0.0	116.4	425.7
4	200.0	2.1	96.9	423.6
5	155.0	1.3	115.2	420.8
6	135.0	0.4	124.5	422.2
7	135.0	1.0	122.7	418.2
8	130.0	0.0	126.7	422.4
9	175.0	0.8	107.5	423.1
10	155.0	0.3	117.3	425.7
11	175.0	0.8	107.9	424.1
12	200.0	2.1	99.5	429.6
13	165.0	1.3	107.7	413.5

THE NET SYSTEM DEMAND = 14.484
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)

PIPE NO.	FLOW
1	14.48

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO.	DEMAND
GLOBAL DEMAND FACTOR =	.5
12	4.98625
4	2.1
2	1.462

Max. Day Plus 2,000 GPM
Fire Flow at Node 12

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 2 - ACCURACY ATTAINED = .0019

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	14.48	4.59	0.00	0.00	3.17	0.87
2	1	2	7.17	1.03	0.00	0.00	2.26	0.57
3	2	3	3.25	2.86	0.00	0.00	2.30	1.10
4	3	4	2.10	2.04	0.00	0.00	2.33	1.46
5	3	5	1.15	4.98	0.00	0.00	2.26	2.26
6	6	5	0.19	1.34	0.00	0.00	0.83	0.57
7	6	7	0.53	4.27	0.00	0.00	2.34	3.88
8	8	7	0.46	3.84	0.00	0.00	2.02	2.95
9	9	8	0.23	1.17	0.00	0.00	1.02	0.84
10	10	9	1.04	2.83	0.00	0.00	2.05	1.89
11	10	6	1.08	3.58	0.00	0.00	2.14	2.04
12	2	10	2.46	2.93	0.00	0.00	2.72	1.95
13	11	8	0.23	1.00	0.00	0.00	1.00	0.80
14	12	11	1.03	4.84	0.00	0.00	2.03	1.86
15	1	12	7.32	2.11	0.00	0.00	3.60	1.76
16	12	13	1.30	16.01	0.00	0.00	2.56	2.86

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	110.7	430.4
2	200.0	1.5	99.4	429.4
3	157.0	0.0	116.8	426.5
4	200.0	2.1	97.3	424.5
5	155.0	1.3	115.5	421.5
6	135.0	0.4	124.7	422.9
7	135.0	1.0	122.9	418.6
8	130.0	0.0	126.7	422.5
9	175.0	0.8	107.7	423.6

10	155.0	0.3	117.6	426.5
11	175.0	0.8	107.7	423.5
12	200.0	5.0	98.9	428.3
13	165.0	1.3	107.2	412.3

THE NET SYSTEM DEMAND = 14.484
SUMMARY OF INFLOWS(+) AND OUTFLOWS(-)

PIPE NO.	FLOW
1	14.48

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO.	DEMAND
GLOBAL DEMAND FACTOR =	.5
13	4.18
4	2.1
2	1.462
12	2.10625

Max. Day Plus 2,000 GPM Fire Flow at Node 13

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 1 - ACCURACY ATTAINED = 0

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	14.48	4.59	0.00	0.00	3.17	0.87
2	1	2	7.17	1.03	0.00	0.00	2.26	0.57
3	2	3	3.25	2.86	0.00	0.00	2.30	1.10
4	3	4	2.10	2.04	0.00	0.00	2.33	1.46
5	3	5	1.15	4.98	0.00	0.00	2.26	2.26
6	6	5	0.19	1.34	0.00	0.00	0.83	0.57
7	6	7	0.53	4.27	0.00	0.00	2.34	3.88
8	8	7	0.46	3.84	0.00	0.00	2.02	2.95
9	9	8	0.23	1.17	0.00	0.00	1.02	0.84
10	10	9	1.04	2.83	0.00	0.00	2.05	1.89
11	10	6	1.08	3.58	0.00	0.00	2.14	2.04
12	2	10	2.46	2.93	0.00	0.00	2.72	1.95
13	11	8	0.23	1.00	0.00	0.00	1.00	0.80
14	12	11	1.03	4.84	0.00	0.00	2.03	1.86
15	1	12	7.32	2.11	0.00	0.00	3.60	1.76
16	12	13	4.18	139.25	0.00	0.00	8.23	24.87

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	110.7	430.4
2	200.0	1.5	99.4	429.4
3	157.0	0.0	116.8	426.5
4	200.0	2.1	97.3	424.5
5	155.0	1.3	115.5	421.5
6	135.0	0.4	124.7	422.9
7	135.0	1.0	122.9	418.6
8	130.0	0.0	126.7	422.5
9	175.0	0.8	107.7	423.6
10	155.0	0.3	117.6	426.5
11	175.0	0.8	107.7	423.5
12	200.0	2.1	98.9	428.3
13	165.0	4.2	53.8	289.0

THE NET SYSTEM DEMAND = 14.484

SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 14.48

***** END OF THIS SIMULATION *****

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Exhibit 3
Hydraulic Analysis of the
440-Foot Service Zone
With Two 6,000 GPM Pumps On

*** UNIVERSITY OF KENTUCKY PIPE NETWORK ANALYSIS PROGRAM - 1985 VERSION ***
 RESULTS TO OUTPUT FILE

INPUT DATA FILE NAME FOR THIS SIMULATION = EKUPR.DAT
 OUTPUT DATA FILE NAME FOR THIS SIMULATION = EKUPR.OUT

NUMBER OF PIPES = 18
 NUMBER OF JUNCTION NODES = 14
 FLOW UNITS = MILLION GALLONS / DAY
 PRESSURE UNITS = PSI

**** SUMMARY OF INPUT DATA ****

PIPE NO.	NODE #1	NODE #2	LENGTH (FT.)	DIAM. (IN.)	HW-C VALUE	SUM-M FACT.	PUMP TYPE	FGN GRADE
1	0	1	3800.0	36.0	130.0	0.0	0.0	435.0
2	1	2	1800.0	30.0	130.0	0.0	0.0	
3	2	3	2600.0	20.0	120.0	0.0	0.0	
4	3	4	1400.0	16.0	120.0	0.0	0.0	
5	3	5	2200.0	12.0	110.0	0.0	0.0	
6	6	5	2350.0	8.0	110.0	0.0	0.0	
7	6	7	1100.0	8.0	110.0	0.0	0.0	
8	8	7	1300.0	8.0	110.0	0.0	0.0	
9	9	8	1400.0	8.0	110.0	0.0	0.0	
10	10	9	1500.0	12.0	110.0	0.0	0.0	
11	10	6	1750.0	12.0	110.0	0.0	0.0	
12	2	10	1500.0	16.0	120.0	0.0	0.0	
13	11	8	1250.0	8.0	110.0	0.0	0.0	
14	12	11	2600.0	12.0	110.0	0.0	0.0	
15	1	12	1200.0	24.0	130.0	0.0	0.0	
16	12	13	5600.0	12.0	110.0	0.0	0.0	
17	14	1	1500.0	36.0	130.0	0.0	0.0	
18	0	14	100.0	30.0	130.0	0.0	1.0	223.0

*** DATA FOR PUMPS FOR THIS SYSTEM ***

PUMP TYPE # 1 IS DESCRIBED BY THE FOLLOWING DATA:

HEAD	DISCHARGE
250	0
220	17.28
200	24.56

JUNCT. NO.	DEMAND	ELEVATION
1	0.0	175.0
2	2.9	200.0
3	0.0	157.0
4	4.2	200.0
5	2.7	155.0
6	0.7	135.0
7	2.0	135.0
8	0.0	130.0
9	1.6	175.0
10	0.7	155.0
11	1.6	175.0
12	4.2	200.0
13	2.6	165.0
14	0.0	208.0

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

Peak Flowrate

NO. OF TRIALS = 3 - ACCURACY ATTAINED = .0011

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	3.74	0.27	0.00	0.00	0.82	0.07
2	1	2	14.25	3.67	0.00	0.00	4.49	2.04
3	2	3	6.48	10.30	0.00	0.00	4.60	3.96
4	3	4	4.20	7.36	0.00	0.00	4.65	5.26
5	3	5	2.28	17.83	0.00	0.00	4.49	8.10
6	6	5	0.39	5.11	0.00	0.00	1.71	2.17
7	6	7	1.03	14.74	0.00	0.00	4.57	13.40
8	8	7	0.94	14.56	0.00	0.00	4.15	11.20
9	9	8	0.40	3.26	0.00	0.00	1.78	2.33
10	10	9	2.02	9.68	0.00	0.00	3.97	6.45
11	10	6	2.15	12.76	0.00	0.00	4.24	7.29
12	2	10	4.84	10.27	0.00	0.00	5.37	6.85
13	11	8	0.54	4.97	0.00	0.00	2.37	3.98
14	12	11	2.15	18.83	0.00	0.00	4.23	7.24
15	1	12	8.96	3.07	0.00	0.00	4.41	2.56
16	12	13	2.60	57.80	0.00	0.00	5.12	10.32
17	14	1	19.46	2.24	0.00	0.00	4.26	1.50
18	0	14	19.46	0.36	0.00	214.34	6.13	3.63

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	112.5	434.7
2	200.0	2.9	100.1	431.1
3	157.0	0.0	114.3	420.8
4	200.0	4.2	92.5	413.4
5	155.0	2.7	107.4	402.9
6	135.0	0.7	118.3	408.0
7	135.0	2.0	111.9	393.3
8	130.0	0.0	120.4	407.8
9	175.0	1.6	102.3	411.1
10	155.0	0.7	115.2	420.8
11	175.0	1.6	103.1	412.8
12	200.0	4.2	100.4	431.7
13	165.0	2.6	90.5	373.9
14	208.0	0.0	99.2	437.0

THE NET SYSTEM DEMAND = 23.208
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)

PIPE NO.	FLOW
1	3.74
18	19.46

SUMMARY OF PUMP OPERATION

PIPE NO.	PUMP TYPE	PUMP FLOW	PUMP HEAD	USEFUL POWER	EFFICIENCY	TOTAL KWH
18	1	19.46	214.34	732.26	0.80	682.83

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO.	DEMAND
------------	--------

GLOBAL DEMAND FACTOR = .5
 4 4.98

Max. Day Plus 2,000 GPM
 Fire Flow at Node 4

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 3 - ACCURACY ATTAINED = .0012

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	-4.74	0.42	0.00	0.00	1.04	0.11
2	1	2	9.95	1.89	0.00	0.00	3.14	1.05
3	2	3	5.94	8.77	0.00	0.00	4.21	3.37
4	3	4	4.98	10.10	0.00	0.00	5.52	7.21
5	3	5	0.96	3.60	0.00	0.00	1.89	1.64
6	6	5	0.37	4.78	0.00	0.00	1.65	2.03
7	6	7	0.48	3.57	0.00	0.00	2.13	3.25
8	8	7	0.50	4.62	0.00	0.00	2.23	3.56
9	9	8	0.19	0.79	0.00	0.00	0.83	0.56
10	10	9	0.99	2.61	0.00	0.00	1.96	1.74
11	10	6	1.22	4.46	0.00	0.00	2.41	2.55
12	2	10	2.55	3.13	0.00	0.00	2.83	2.09
13	11	8	0.32	1.89	0.00	0.00	1.41	1.51
14	12	11	1.12	5.67	0.00	0.00	2.21	2.18
15	1	12	4.53	0.87	0.00	0.00	2.23	0.72
16	12	13	1.30	16.01	0.00	0.00	2.56	2.86
17	14	1	19.23	2.19	0.00	0.00	4.21	1.46
18	0	14	19.23	0.36	0.00	214.97	6.06	3.55

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	112.8	435.4
2	200.0	1.5	101.2	433.5
3	157.0	0.0	116.0	424.8
4	200.0	5.0	93.0	414.7
5	155.0	1.3	115.3	421.2
6	135.0	0.4	126.1	425.9
7	135.0	1.0	124.5	422.4
8	130.0	0.0	128.7	427.0
9	175.0	0.8	109.5	427.8
10	155.0	0.3	119.3	430.4
11	175.0	0.8	110.0	428.9
12	200.0	2.1	101.6	434.5
13	165.0	1.3	109.9	418.5
14	208.0	0.0	99.5	437.6

THE NET SYSTEM DEMAND = 14.484
 SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)

PIPE NO.	FLOW
1	-4.74
18	19.23

SUMMARY OF PUMP OPERATION

PIPE NO.	PUMP TYPE	PUMP FLOW	PUMP HEAD	USEFUL POWER	EFFICIENCY	TOTAL KWH
18	1	19.23	214.97	725.50	0.80	676.53

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO. DEMAND
 GLOBAL DEMAND FACTOR = .5
 2 4.342
 4 2.1

Max. Day Plus 2,000 GPM
 Fire Flow at Node 2

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 2 - ACCURACY ATTAINED = .0033

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	-4.74	0.42	0.00	0.00	1.04	0.11
2	1	2	9.98	1.90	0.00	0.00	3.14	1.05
3	2	3	3.24	2.85	0.00	0.00	2.30	1.10
4	3	4	2.10	2.04	0.00	0.00	2.33	1.46
5	3	5	1.14	4.91	0.00	0.00	2.24	2.23
6	6	5	0.20	1.47	0.00	0.00	0.87	0.63
7	6	7	0.51	3.97	0.00	0.00	2.25	3.61
8	8	7	0.48	4.16	0.00	0.00	2.11	3.20
9	9	8	0.18	0.74	0.00	0.00	0.80	0.53
10	10	9	0.99	2.58	0.00	0.00	1.95	1.72
11	10	6	1.07	3.51	0.00	0.00	2.11	2.01
12	2	10	2.40	2.79	0.00	0.00	2.66	1.86
13	11	8	0.30	1.67	0.00	0.00	1.31	1.33
14	12	11	1.10	5.48	0.00	0.00	2.17	2.11
15	1	12	4.51	0.86	0.00	0.00	2.22	0.72
16	12	13	1.30	16.01	0.00	0.00	2.56	2.86
17	14	1	19.23	2.19	0.00	0.00	4.21	1.46
18	0	14	19.23	0.36	0.00	214.97	6.06	3.55

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	112.8	435.4
2	200.0	4.3	101.2	433.5
3	157.0	0.0	118.6	430.7
4	200.0	2.1	99.1	428.6
5	155.0	1.3	117.3	425.8
6	135.0	0.4	126.6	427.2
7	135.0	1.0	124.9	423.3
8	130.0	0.0	128.9	427.4
9	175.0	0.8	109.7	428.1
10	155.0	0.3	119.5	430.7
11	175.0	0.8	110.1	429.1
12	200.0	2.1	101.6	434.6
13	165.0	1.3	109.9	418.5
14	208.0	0.0	99.5	437.6

THE NET SYSTEM DEMAND = 14.484
 SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)

PIPE NO.	FLOW
1	-4.74
18	19.23

SUMMARY OF PUMP OPERATION

PIPE NO.	PUMP TYPE	PUMP FLOW	PUMP HEAD	USEFUL POWER	EFFIC- IENCY	TOTAL KWH
18	1	19.23	214.97	725.50	0.80	676.53

THE FOLLOWING CHANGES ARE MADE

JUNCT. NO. DEMAND
 GLOBAL DEMAND FACTOR = .5
 12 4.98625
 4 2.1
 2 1.462

Max. Day Plus 2,000 GPM
 Fire Flow at Node 12

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 2 - ACCURACY ATTAINED = .001

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	-4.74	0.42	0.00	0.00	1.04	0.11
2	1	2	7.17	1.03	0.00	0.00	2.26	0.57
3	2	3	3.25	2.86	0.00	0.00	2.30	1.10
4	3	4	2.10	2.04	0.00	0.00	2.33	1.46
5	3	5	1.15	4.98	0.00	0.00	2.26	2.26
6	6	5	0.19	1.34	0.00	0.00	0.83	0.57
7	6	7	0.53	4.27	0.00	0.00	2.34	3.88
8	8	7	0.46	3.84	0.00	0.00	2.02	2.95
9	9	8	0.23	1.17	0.00	0.00	1.02	0.84
10	10	9	1.04	2.83	0.00	0.00	2.05	1.89
11	10	6	1.08	3.58	0.00	0.00	2.14	2.04
12	2	10	2.46	2.93	0.00	0.00	2.72	1.95
13	11	8	0.23	1.00	0.00	0.00	1.00	0.80
14	12	11	1.03	4.84	0.00	0.00	2.03	1.86
15	1	12	7.32	2.11	0.00	0.00	3.60	1.76
16	12	13	1.30	16.01	0.00	0.00	2.56	2.86
17	14	1	19.23	2.19	0.00	0.00	4.21	1.46
18	0	14	19.23	0.36	0.00	214.97	6.06	3.55

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	112.8	435.4
2	200.0	1.5	101.6	434.4
3	157.0	0.0	119.0	431.5
4	200.0	2.1	99.4	429.5
5	155.0	1.3	117.7	426.5
6	135.0	0.4	126.9	427.9
7	135.0	1.0	125.1	423.6
8	130.0	0.0	128.9	427.5
9	175.0	0.8	109.9	428.6
10	155.0	0.3	119.8	431.5
11	175.0	0.8	109.8	428.5
12	200.0	5.0	101.1	433.3
13	165.0	1.3	109.3	417.3
14	208.0	0.0	99.5	437.6

THE NET SYSTEM DEMAND = 14.484
 SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)

PIPE NO.	FLOW
1	-4.74
18	19.23

SUMMARY OF PUMP OPERATION

PIPE NO.	PUMP TYPE	PUMP FLOW	PUMP HEAD	USEFUL POWER	EFFICIENCY	TOTAL KWH
18	1	19.23	214.97	725.50	0.80	676.53

THE FOLLOWING CHANGES ARE MADE

Max. Day Plus 2,000 GPM
Fire Flow at Node 13

JUNCT. NO. DEMAND
GLOBAL DEMAND FACTOR = .5
13 4.18
4 2.1
2 1.462
12 2.10625

**** THE RESULTS FOR THIS SIMULATION FOLLOW ****

NO. OF TRIALS = 1 - ACCURACY ATTAINED = 0

PIPE NO.	NODE #1	NODE #2	FLOW RATE	HEAD LOSS	MINOR LOSS	PUMP HEAD	LINE VELOCITY	HL 1000
1	0	1	-4.74	0.42	0.00	0.00	1.04	0.11
2	1	2	7.17	1.03	0.00	0.00	2.26	0.57
3	2	3	3.25	2.86	0.00	0.00	2.30	1.10
4	3	4	2.10	2.04	0.00	0.00	2.33	1.46
5	3	5	1.15	4.98	0.00	0.00	2.26	2.26
6	6	5	0.19	1.34	0.00	0.00	0.83	0.57
7	6	7	0.53	4.27	0.00	0.00	2.34	3.88
8	8	7	0.46	3.84	0.00	0.00	2.02	2.95
9	9	8	0.23	1.17	0.00	0.00	1.02	0.84
10	10	9	1.04	2.83	0.00	0.00	2.05	1.89
11	10	6	1.08	3.58	0.00	0.00	2.14	2.04
12	2	10	2.46	2.93	0.00	0.00	2.72	1.95
13	11	8	0.23	1.00	0.00	0.00	1.00	0.80
14	12	11	1.03	4.84	0.00	0.00	2.03	1.86
15	1	12	7.32	2.11	0.00	0.00	3.60	1.76
16	12	13	4.18	139.25	0.00	0.00	8.23	24.87
17	14	1	19.23	2.19	0.00	0.00	4.21	1.46
18	0	14	19.23	0.36	0.00	214.97	6.06	3.55

JUNCTION NO.	ELEVATION (FT.)	DEMAND	PRESSURE (PSI)	HYDRAULIC GRADE
1	175.0	0.0	112.8	435.4
2	200.0	1.5	101.6	434.4
3	157.0	0.0	119.0	431.5
4	200.0	2.1	99.4	429.5
5	155.0	1.3	117.7	426.5
6	135.0	0.4	126.9	427.9
7	135.0	1.0	125.1	423.6
8	130.0	0.0	128.9	427.5
9	175.0	0.8	109.9	428.6
10	155.0	0.3	119.8	431.5
11	175.0	0.8	109.8	428.5
12	200.0	2.1	101.1	433.3
13	165.0	4.2	55.9	294.0
14	208.0	0.0	99.5	437.6

THE NET SYSTEM DEMAND = 14.484
SUMMARY OF INFLOWS (+) AND OUTFLOWS (-)
PIPE NO. FLOW
1 -4.74
18 19.23

SUMMARY OF PUMP OPERATION

PIPE NO.	PUMP TYPE	PUMP FLOW	PUMP HEAD	USEFUL POWER	EFFIC- IENCY	TOTAL KWH
18	1	19.23	214.97	725.50	0.80	676.53

***** END OF THIS SIMULATION *****

Appendix K

Traffic Impact Assessment Report for East Kapolei Project
Pacific Planning & Engineering, October 1994

TRAFFIC IMPACT ASSESSMENT REPORT

FOR

EAST KAPOLEI PROJECT

17 October 1994

Honolulu, Oahu, Hawaii

Prepared for:

Schuler Homes, Inc. and Hawaiian Trust Co., Ltd.

Prepared By:

**Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 6D
Honolulu, Hawaii 96814**

FOREWORD

The traffic forecasts shown within this report's figures and tables are the direct result of Pacific Planning & Engineering, Inc.'s proprietary analytical tools. For report editing and review purposes, the forecast values have been rounded to the nearest five vehicles from our mathematical results, although we do not imply this level of accuracy can exist in any forecast method. The rounded values, however, reasonably quantify the forecasted traffic volumes for the purposes of this study.

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EXECUTIVE SUMMARY

Pacific Planning & Engineering, Inc. (PPE) was engaged to undertake a study to identify and assess future traffic impacts caused by the proposed East Kapolei Project.

This report describes the methodology and guidelines used to address the above concerns and presents the findings and recommendations from the study.

Project Description

Schuler Homes, Inc. and Hawaiian Trust Co., Ltd. are proposing to construct the East Kapolei Project in Honolulu, Oahu, Hawaii.

The project is divided into two phases. The first phase includes development of 500 acres by year 2005, and the second phase 522 acres by year 2011. The project is located west of Fort Weaver Road in Ewa, south of existing Farrington Highway, and just east of the proposed North-South Road. The area is currently agricultural, with no existing traffic. The table below summarizes the proposed land uses by phase.

Vehicular access to the Project will be provided by three intersections. The first intersection will be located on Farrington Highway when a major spine road is constructed. Two other intersections will be connected to the proposed North-South Road at points serving the proposed University site forming four-legged intersections. Direct connection to Fort Weaver Road was discouraged by the State Highways Division due to the traffic conditions on that roadway.

Table 1. Land Use Summary (Acres)			
Land Use	Phase 1	Phase 2	Total
Residential	458	490	948
Commercial	10	10	20
School	12	0	12
Parks	10	10	20
Circulation	10	12	22
Total	500	522	1,022

Study Methodology

This Report identifies and describes the probable impact of the traffic generated by the proposed development in the year 2005 and 2011 when the project is expected to be completed in two phases. The analysis primarily focuses on the following intersections:

- Farrington Highway and Project Spine Road
- Proposed North-South Road at Secondary Project Road
- Proposed North-South Road at Project Spine Road
- Ramps at H-1 Interchange with Proposed North-South Road

Traffic was forecasted for the years 2005 and 2011 at the study intersections and ramps by:

- adjusting trips for current development absorption rates as calculated based on the City Planning Department preliminary population estimates¹ for areas within the Ewa region,
- updating land uses and roadway plans for 2005 and 2010 prepared for

¹ Draft values for possible adoption in the OMPO planning process. The process is undergoing updating of models and plans. This study and results are intended solely for assessing the traffic impact on relevant roadways by the East Kapolei Project. Forecast values are not intended as a substitute for the formal OMPO planning results.

- the Ewa Region Highway Master Plan,
- preparing aggregated zonal trip tables for the years 2005 and 2011 for the morning and afternoon peak hours,
 - estimating traffic assignments to study roadways and balancing volumes for capacity restraints,
 - forecast traffic generated by the proposed commercial project, University, High School and housing development of the Department of Hawaiian Home Lands,
 - estimating traffic generated by the project and assigning traffic to the study roadways, and
 - adding the traffic forecasts for the project and other developments.

The Report describes the impacts on each study roadway segment by the *level-of-service* (LOS) and *capacity levels* for years 2005 and 2011 traffic conditions "without project" and years 2005 and 2011 traffic conditions "with" Project.

Conclusions & Recommendations

The results of the traffic operations analysis indicate that the proposed East Kapolei Project will significantly change the traffic flow quality at the study intersections when the project is completed in two phases. Major road improvements have already been identified in the Ewa Region Highway Master Plan and adopted by the Oahu Metropolitan Planning Organization (OMPO). These improvements are assumed as part of the roadway network in 2005 and 2011 in the assessment of the traffic impacts.

For the year 2005 (Phase 1), in order to minimize the impact of the project and provide for smoother traffic operating conditions, we recommend the following:

- Two left-turn lanes northbound exiting the project driveway onto Farrington Highway.
- Two left-turn lanes westbound at the intersection of Farrington Highway and the North-South Road.
- Addition of an extra through lane from about 1000' west of the intersection of Farrington Highway and the North-South Road to Project Driveway C, east of the intersection.
- A project connection to the North-South Road would relieve traffic at other intersections. If a connection is made, the two-left-turn lanes at the intersections of Farrington Highway with the North-South Road and Project Driveway C may not be required to handle makai-bound traffic volumes. However, makai-bound traffic would shift to the North-South Road connection and thus this intersection would require two left turn lanes exiting the project.

For the year 2011 (Phase 2), mitigative measures to the study intersections would be more involved because of the level of traffic volumes during the peak hours.

The possibility of a grade separation at the intersection of Farrington Highway and the North-South Road would increase capacity through the area. However, alternate methods of transportation actions should be investigated. A comprehensive plan that includes both Transportation System Management and Transportation Demand Management concepts should be developed for the area which would include the Project. The future traffic levels have regional sources that are undergoing current development. Integrated transit services, roadway plans and construction schedules, computer controlled traffic lights, remote parking areas, shuttle services, paratransit, bicycle and pedestrian ways, and some form of exclusive way transit should be considered in a comprehensive plan. Beyond transportation actions, the need for integrated land use planning

EXECUTIVE SUMMARY

for all the major parcels will aid in reducing the need for vehicle trips.

From a planning perspective, OMPO's current efforts to update its Long Range Plan will institute new population and traffic forecast values for the Ewa Region. The results reported herein pertain specifically to the East Kapolei Project in addition to current preliminary population estimates. This assessment approach is conservative in that the impact is greater than would be expected, as population exceeds what is set forth in preliminary figures. The OMPO's new region-wide forecasts will likely result in less impacts and roadway needs than indicated herein due to smaller values of population. A major roadway needs study is needed to update the previous study for the Ewa Region.

An example of a potentially major change that should be included in the update study is the final version of the BPNAS Reuse Plan. This and other major land use proposals in the Ewa Region should be evaluated for traffic impact on a region-wide basis, and their mitigating actions included in the afore-mentioned comprehensive transportation plan. Thus, 2011 (Phase 2) impacts should be re-evaluated when those forecasts are available, and a plan be developed that not only addresses highway projects but land use planning (to obviate the need for vehicle trips) transit, and other modes and services as well.

PROJECT DESCRIPTION

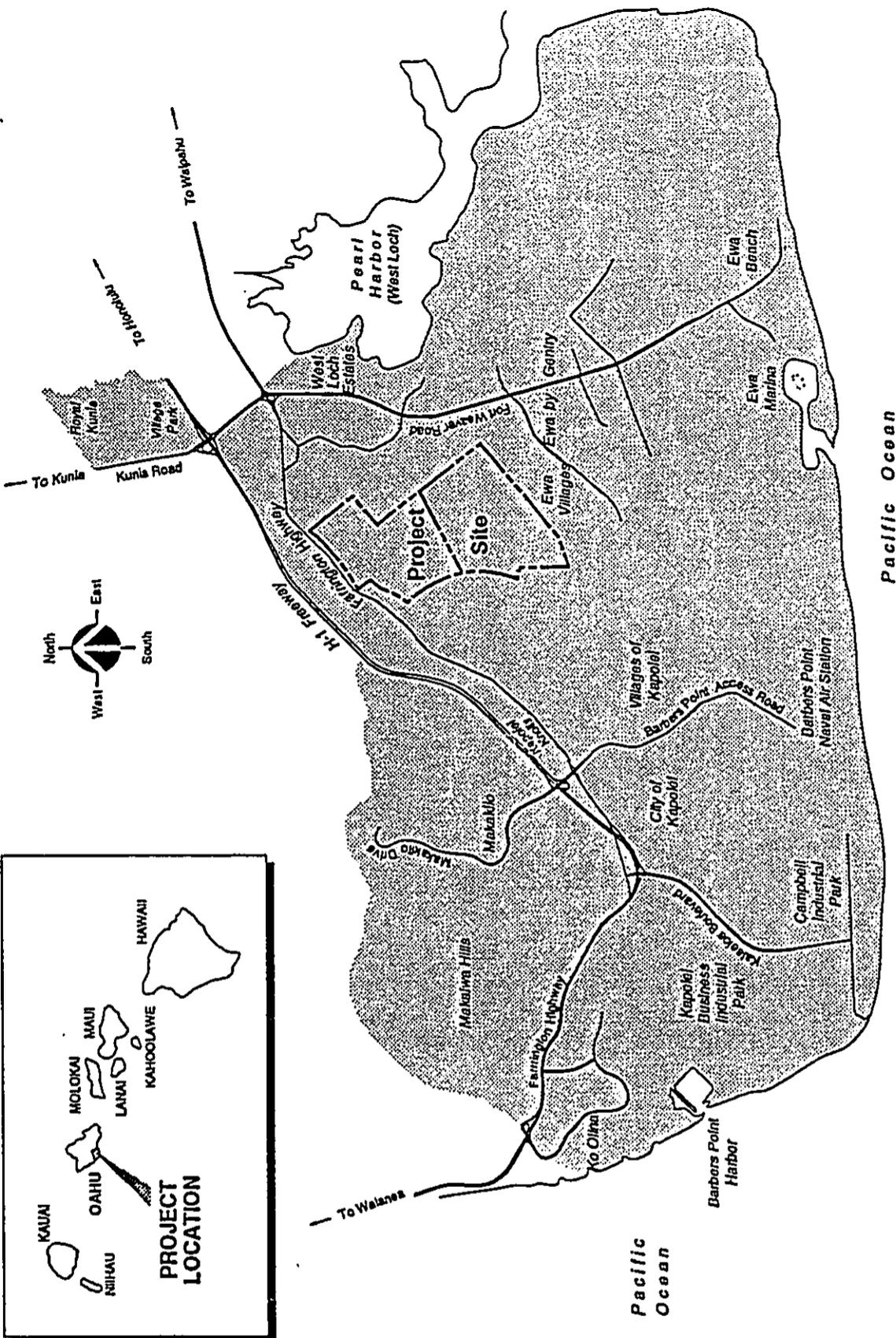
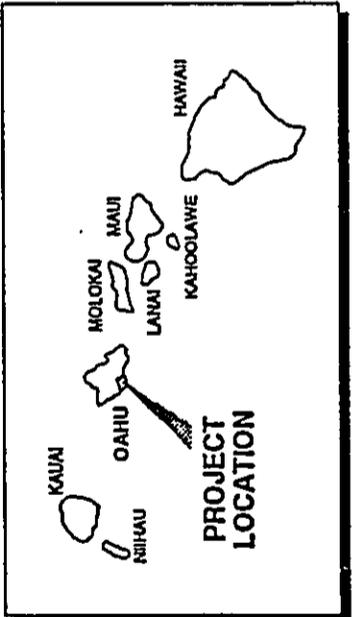
Schuler Homes, Inc. and Hawaiian Trust Co., Ltd. are proposing to construct the East Kapolei Project in Ewa, Oahu. Figure 1 shows the project location and roadway network in the vicinity.

Project Land Uses

The project is divided into two phases. The first phase includes development of 500 acres by year 2005, and the second phase 522 acres by year 2011. The project is located west of Fort Weaver Road in Ewa, south of existing Farrington Highway, and just east of the proposed North-South Road. The area is currently agricultural, with no existing traffic. Table 2 below summarizes the proposed land uses by phase. Figure 2 shows the Project Site Plan.

Table 2. Land Use Summary (Acres)			
Land Use	Phase 1	Phase 2	Total
Residential	458	490	948
Commercial	10	10	20
School	12	0	12
Parks	10	10	20
Circulation	10	12	22
Total	500	522	1,022

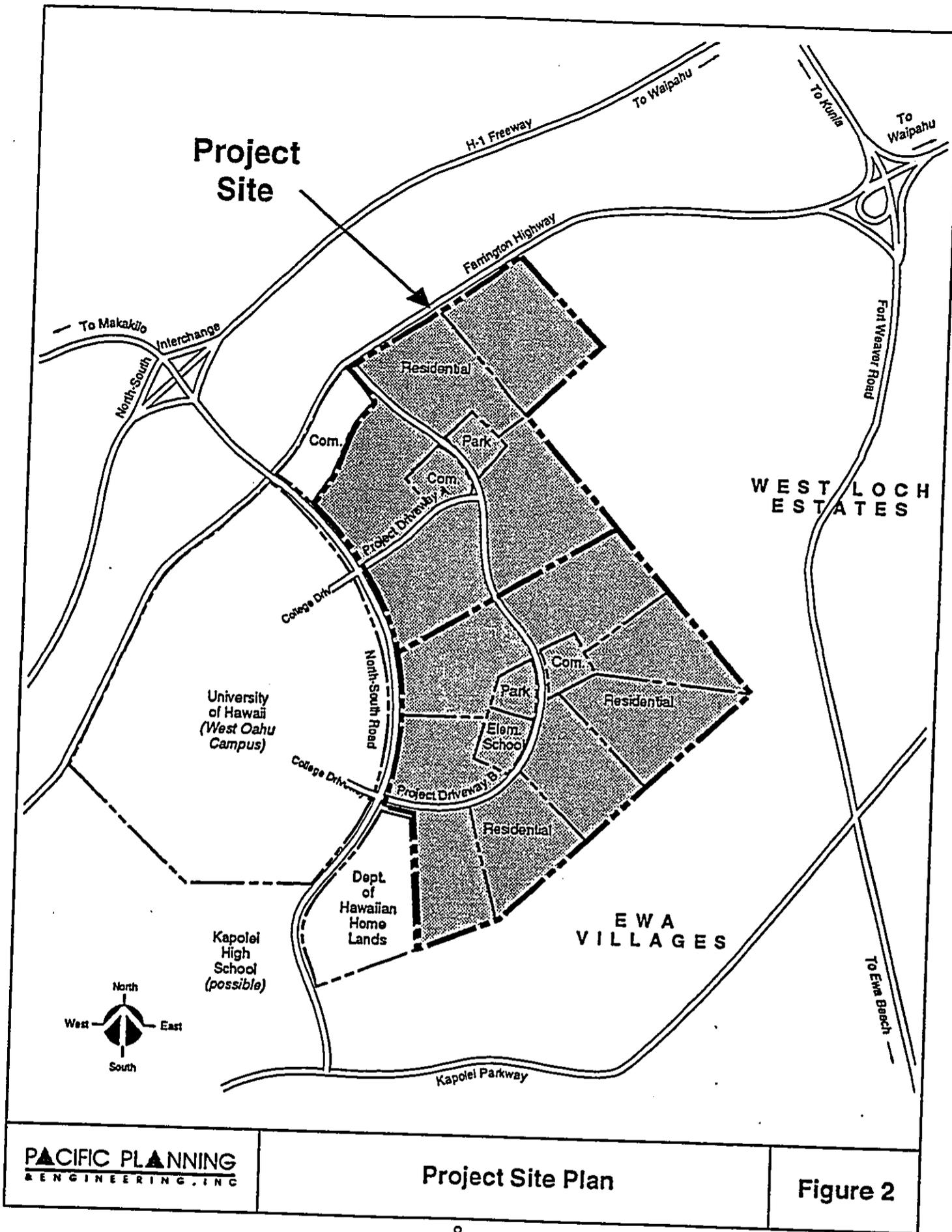
Vehicular access to the Project will be provided by three intersections. The first intersection will be located on Farrington Highway when a major spine road is constructed. The other two intersections will be connected to the proposed North-South Road at points serving the proposed University site forming four-legged intersections.



PACIFIC PLANNING
ENGINEERING, INC.

Project Location Map

Figure 1



Project Site Plan

Figure 2

EXISTING CONDITIONS

Land Uses

The existing land is in agriculture. There are no vehicle trips generated in the project site.

Roadway Facilities

The site is currently served by Farrington Highway, a two-lane highway connecting Waipahu and Kapolei. Just north of Farrington Highway, H-1 freeway serves major east-west traffic demand.

Traffic Conditions

Existing conditions are not relevant for estimating the potential traffic impact of the proposed project since the Ewa region itself is planned for major growth in population and infrastructure. These changes by Years 2005 and 2011 will form the bases of the analysis for the "without project" scenario.

FUTURE CONDITIONS

The future conditions were based on the current schedule of proposed developments in the Ewa Region. Research of planned developments and improvements to transportation facilities was conducted to estimate future traffic conditions at the study road segments. Adjustments were made to previously calculated trip tables for the Ewa Region highway study to update the vehicle trips during the morning and afternoon peak hours in the years 2005 and 2011.

Year 2011 trips were derived by interpolation of most current Planning Department estimates for year 2010 and 2020. These population forecasts are preliminary and are used to reflect the current planning approach to include recent historical trends in absorption rates. While these estimates are used in this study, the forecasts are intended solely for deriving traffic impacts for the East Kapolei project and are not meant to be used for other regional forecast analysis.

Land Uses

In deriving the 2005 trip table, the Ewa region land uses (i.e. housing and employment) for the projects included in the Ewa Region highway study were based on the individual developer projections of land uses and completion schedules and adjusted for the planning department estimates. Estimates of *existing* land uses were based on available data. These land uses were updated for this traffic study.

The Planning Department land use forecasts and HALI 2005 traffic forecasts include construction employment and work trips. To maintain consistency with these forecasts, construction jobs are added to employment

estimates of the Ewa developers for the Master Plan area.

The land use data for existing areas, such as Barbers Point Naval Air Station (BPNAS), Honokai Hale, Nanakai Gardens, Ewa Beach and Iroquois Point, were based on various sources, including planning department estimates, tax maps and other research. However, the land use information obtained for these areas, especially the military bases, was difficult to confirm and could not be as detailed as the developer land use projections. Current plans for the reuse of BPNAS are still in development and no special adjustment was made to existing forecasts.

Projects which are handled separately are:

- commercial development of about 27 acres,
- University of Hawaii, located directly across of the Project and on the west side of the proposed North-South Road,
- Kapolei High School² (originally sited at Kapolei Villages), and
- Department of Hawaiian Home Lands (DHHL) project.

The commercial development was not included in the Ewa Region highway study. Traffic from this development is assumed to occur by 2005. The University is currently in initial planning stages and traffic forecasts are very preliminary in nature. The high school might not be located in the immediate area, since DOE is also in its early stages of reviewing the project. Similarly, the DHHL project is still in its earliest stages of planning. It is unclear as to when and how much of the above project's will actually be developed. However, for the purposes of this impact study, they are all included as being developed and operating.

² While the State Department of Education has not made an official decision to site the high school in this specific area, current proposals include this location. For analysis purposes, the high school is included to ensure a conservative estimate of traffic volumes on the study roadways.

Roadway Facilities

The road network for the years 2005 and 2011 in the immediate area are shown in Figure 3 and 4, respectively. The major road changes planned in the Project area will include the following.

North-South Road

The four-lane North-South Road provides an alternative route to/from the H-1 Freeway for the projects along the Fort Weaver Road corridor. With its link to Farrington Highway and Kapolei Parkway, the North-South Road would also serve to connect Ewa Beach and new residential projects in this vicinity with the employment in the Kapolei area.

North-South Interchange

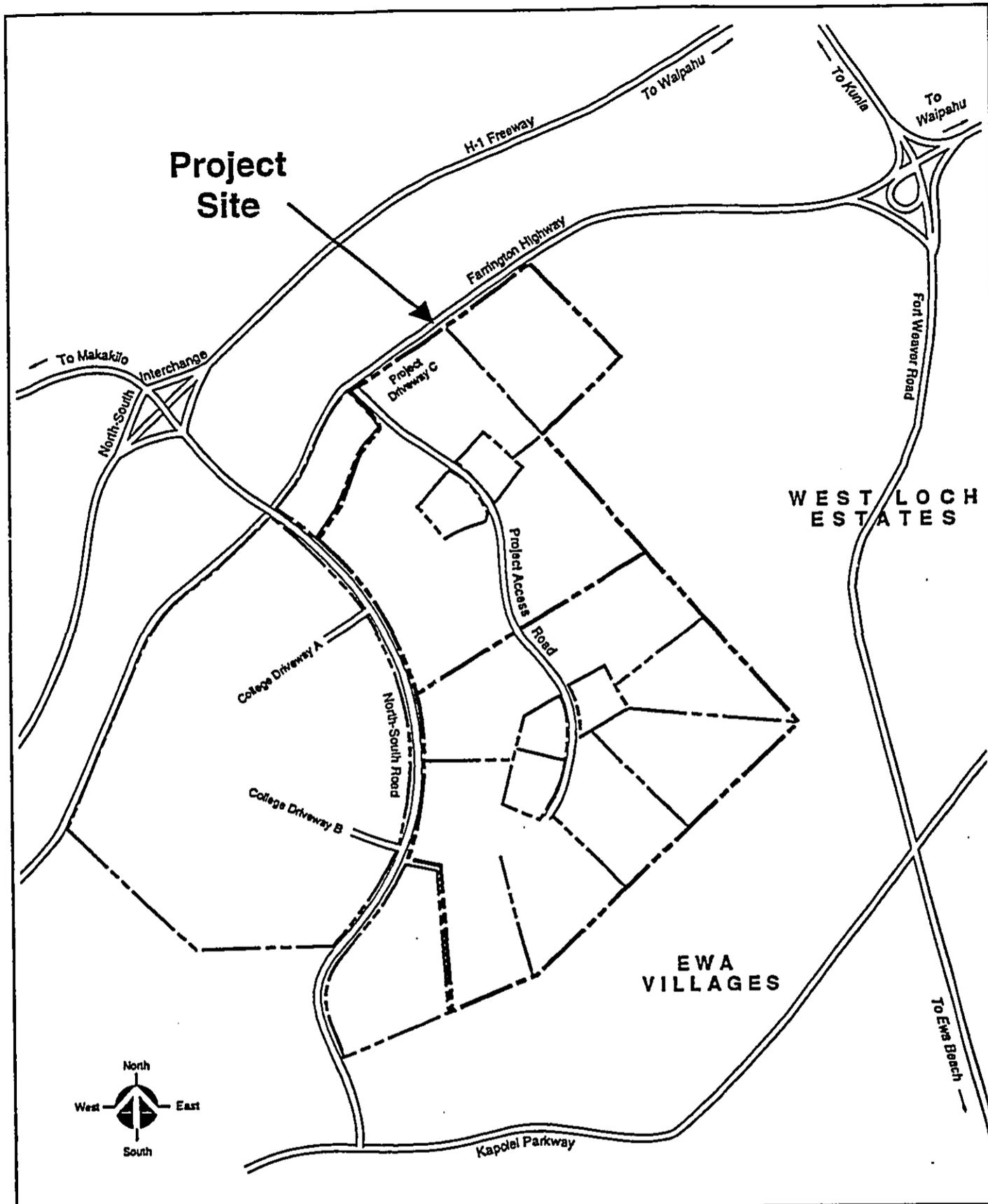
Along with the North-South Road, the new North-South Interchange with H-1 freeway will improve access to several areas within the Ewa region. The North-South Road will provide an alternative route to the Fort Weaver Road corridor and the H-1 Freeway. The North-South Interchange will also serve as a secondary access to the Makakilo development, the Villages of Kapolei, and the City of Kapolei.

Farrington Highway

Farrington Highway, between Barbers Point Access Road and the access to Kapolei Knolls and the Villages of Kapolei, would be widened to provide two travel lanes in each direction with a median turning lane. The widening would increase the capacity of this roadway to accommodate the new developments in this area.

Kapolei Parkway

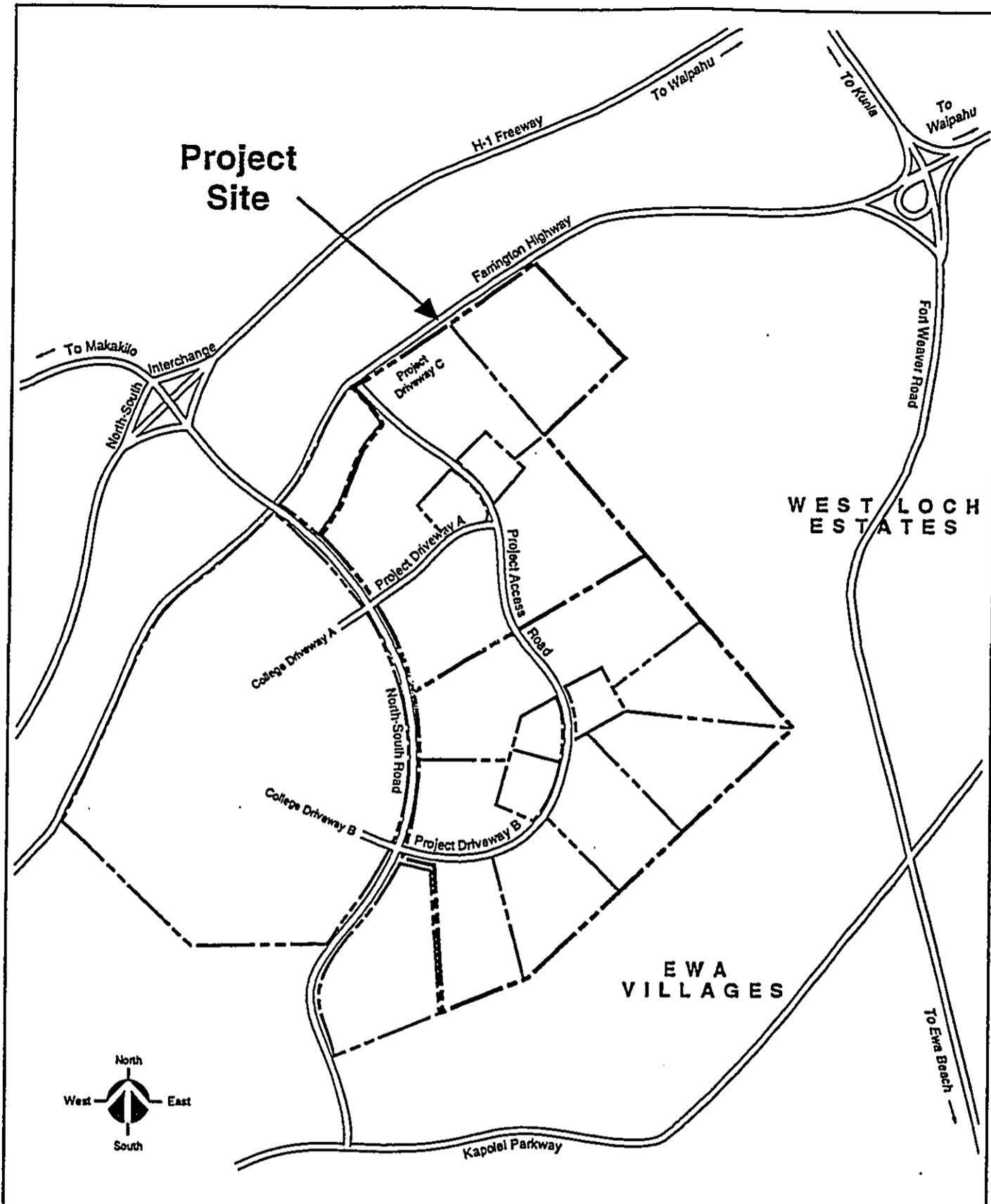
The proposed four- and six-lane Kapolei Parkway provides a new east-west link in the Ewa region between Kalaeloa Boulevard and the North-South Road; this roadway provides additional capacity for vehicles travelling between the residential areas in the east and the employment areas in the west. The provision of Kapolei Parkway will divert traffic that would otherwise need to travel on Farrington Highway or the H-1 Freeway. While this roadway is not a study segment, it is described here since it will be a new facility that will carry a significant amount of regional traffic.



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2005 Roadway Network

Figure 3



PACIFIC PLANNING
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2011 Roadway Network

Figure 4

PROJECTED TRAFFIC CONDITIONS

Future traffic was forecasted for the "without project" and "with project" conditions. Traffic forecasts were developed for the years 2005 and 2011 when the project is expected to be completed in two phases. As can be seen, the roads and therefore, the traffic volume distribution throughout the area will bear little relationship to existing patterns.

Future Traffic Without Project

This component of the future traffic might be considered as the ambient traffic volumes. Future traffic is estimated by identifying all other land uses and forecasting traffic from those land uses.

In total, traffic was forecasted for the years 2005 and 2011 at the study intersections and ramps by:

- updating land uses and roadway plans for 2005 and 2010 prepared for the Ewa Region Highway Master Plan,
- adjusting trips forecasted by the Ewa Region Highway study for current development absorption rates as calculated based on the City Planning Department preliminary population estimates³ for areas within the Ewa region,
- preparing aggregated zonal trip tables for the years 2005 and 2011 for the morning and afternoon peak hours,
- estimating traffic assignments to study roadways and balancing volumes for capacity restraints,

³ Draft values for possible adoption in the OMPO planning process. The process is undergoing updating of models and plans. This study and results are intended solely for assessing the traffic impact on relevant roadways by the East Kapolei Project. Forecast values are not intended as a substitute for the formal OMPO planning results.

PROJECTED TRAFFIC CONDITIONS

- forecast traffic generated by the commercial development, proposed University, High School and housing development the Department of Hawaiian Home Lands,
- estimating traffic generated by the project and assigning traffic to the study roadways, and
- adding the traffic forecasts for the project and other developments.

These values are used to calculate the impacts on each study roadway segment by determining the *level-of-service* (LOS) and *capacity levels* for years 2005 and 2011 traffic conditions without project, and years 2005 and 2011 traffic conditions with the Project.

Traffic forecasts are needed in the analysis to determine the LOS for each road segment of interest by specific time periods. The forecasts for the study roadways are shown in the following figures.

Traffic From Other Developments

In addition to the trips from the major project developments in the Ewa and Kunia areas, three major parcel developments adjacent to the East Kapolei Project will occur in the study time frame. For analysis purposes only, these are :

- commercial development of about 27 acres,
- University of Hawaii, located directly across from the Project and on the west side of the proposed North-South Road,
- Kapolei High School⁴ (originally sited at Kapolei Villages), and
- Department of Hawaiian Home Lands (DHHL) project.

⁴ While the State Department of Education has not made an official decision to site the high school in this specific area, current proposals include this location. For analysis purposes, the high school is included to ensure a conservative estimate of traffic volumes on the study roadways.

PROJECTED TRAFFIC CONDITIONS

The Ewa Region highway study did not include the commercial development and DHHL development. The high school was included in Kapolei Villages. In this analysis, all of the high school traffic and DHHL development are assumed to be directly accessing the study roadways. Trips were deleted from the trip table and manually added on to the roadways for more direct analysis of its effect.

The three-step procedure of trip generation, trip distribution, and traffic assignment was used to estimate peak hour traffic for 2005 and 2011 for these four major parcel uses.

The trip generation step estimates the number of trips which would be generated by the proposed project. The number of trips generated by the projects was estimated based upon trip generation rates, which were obtained from the manual on Trip Generation, by the Institute of Transportation Engineers. Table 3 shows the estimated number of trips generated by the three projects when they are completed.

Table 3. Trip Generation For Other Adjacent Projects				
Land Use	Morning		Afternoon	
	Enter	Exit	Enter	Exit
University	437	96	189	462
High School	470	253	28	47
DHHL Project	125	445	479	260
Commercial	149	88	494	494

The trip distribution step assigns trips to their expected origins and destinations. Trip distribution for the project was estimated based on development of the Ewa Region as the Second City of Oahu.

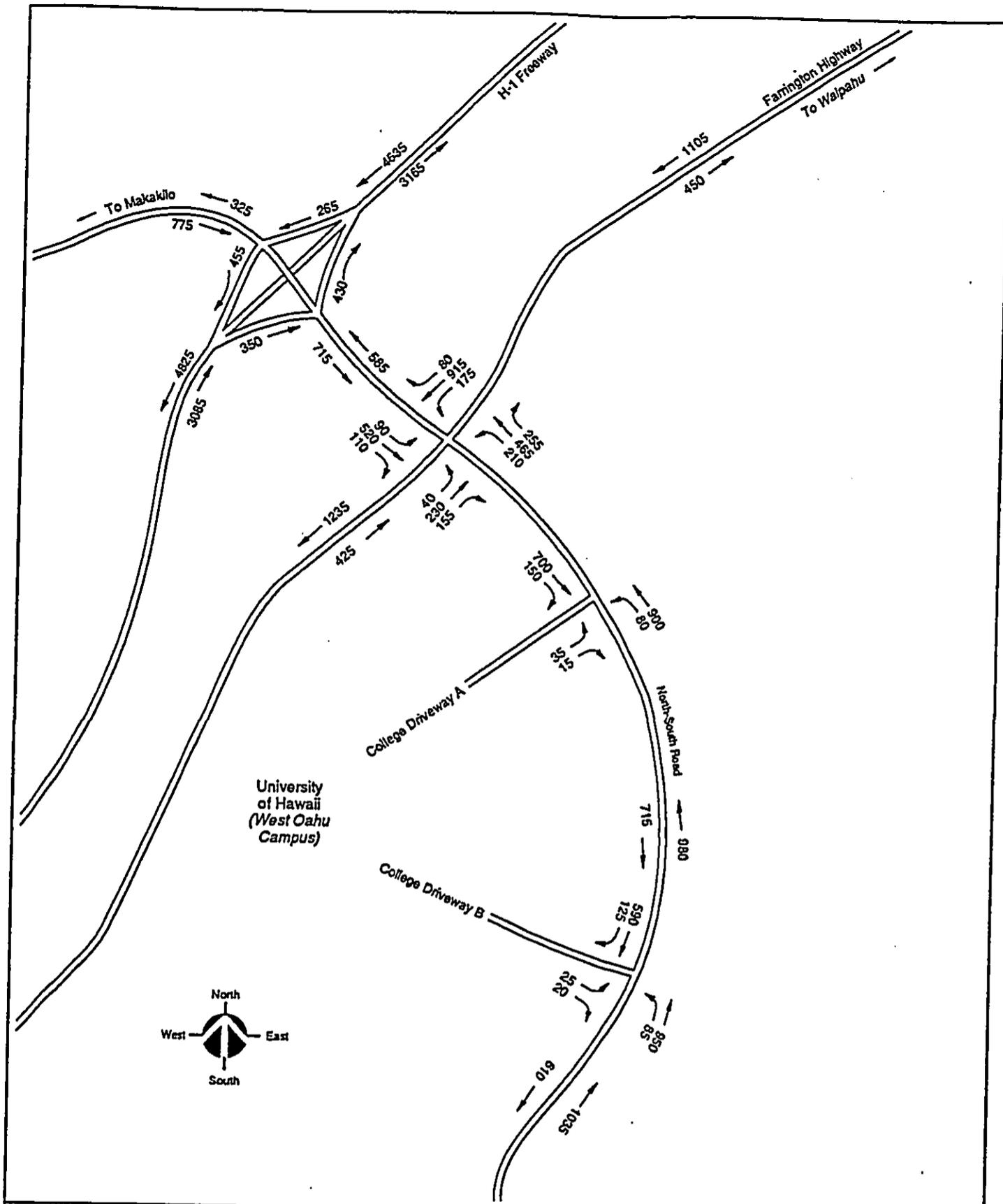
The traffic assignment step assign trips to a specific route on the roadway network that will take the driver from origin to destination.

PROJECTED TRAFFIC CONDITIONS

Traffic was assigned based on the estimated shortest path or travel time from origins to destinations.

For Phase I of the Project, Figure 5 displays the forecasts for the morning peak hour in 2005 without the Project. Figure 6 displays the forecasts for the afternoon peak hour in 2005 without the Project.

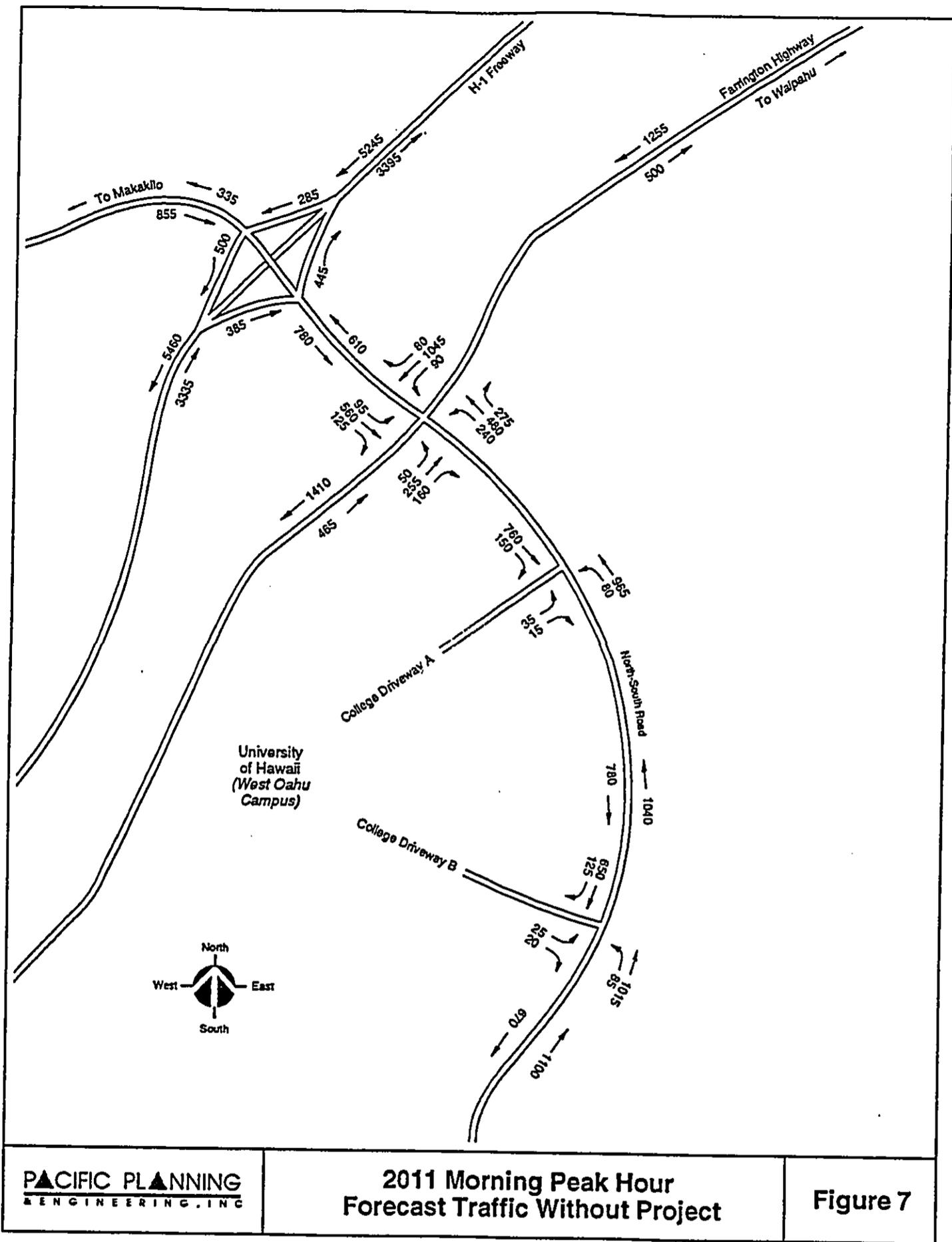
For Phase II of the Project, Figure 7 displays the forecasts for the morning peak hour in 2011 without the Project. Figure 8 displays the forecasts for the afternoon peak hour in 2011 without the Project.



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2005 Morning Peak Hour
Forecast Traffic Without Project

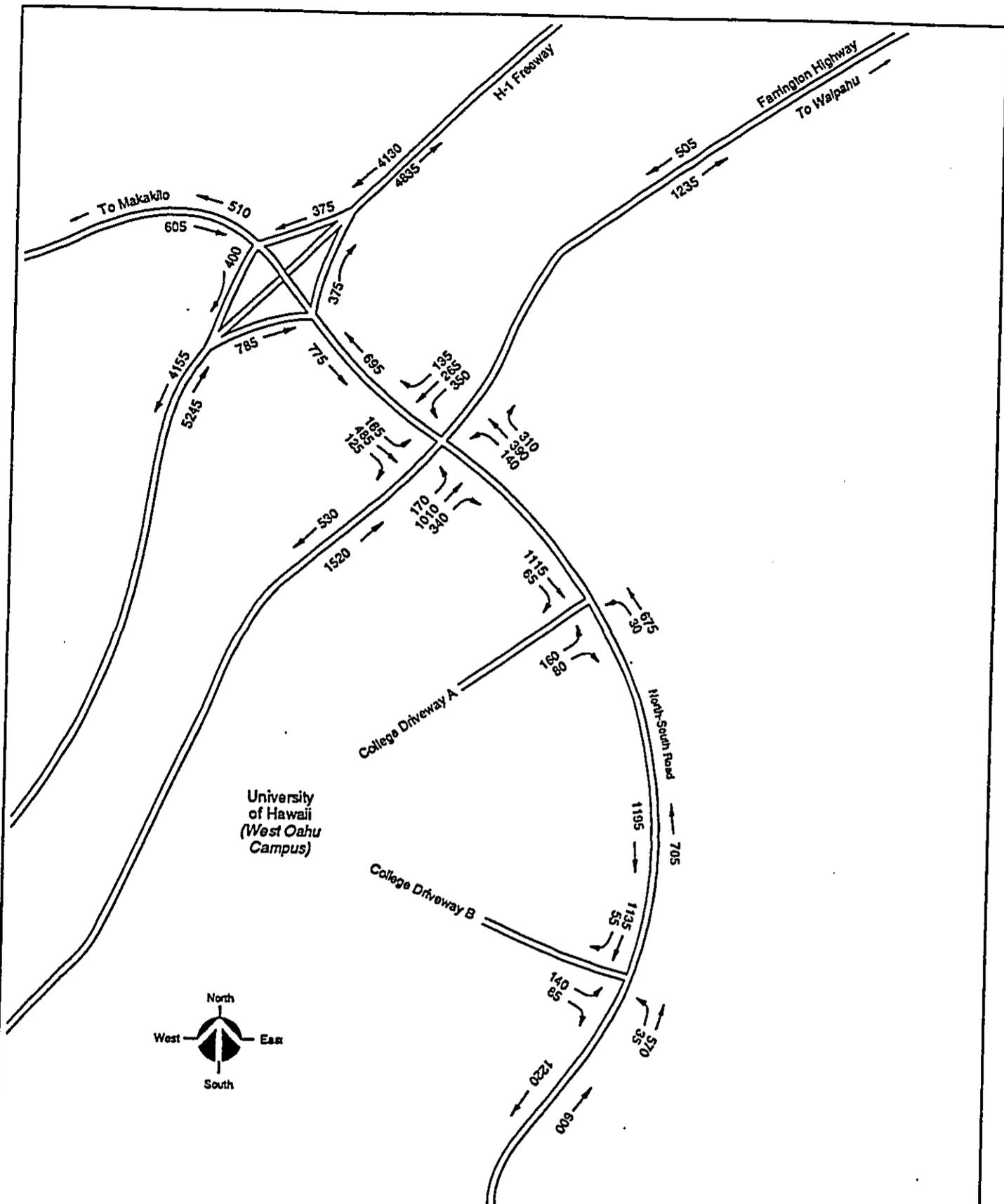
Figure 5



PACIFIC PLANNING
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**2011 Morning Peak Hour
Forecast Traffic Without Project**

Figure 7



PACIFIC PLANNING
ENGINEERING, INC

**2011 Afternoon Peak Hour
Forecast Traffic Without Project**

Figure 8

PROJECTED TRAFFIC CONDITIONS

Future Traffic With Project

Future traffic with the East Kapolei Project included in the land uses is calculated by adding the without project traffic to the traffic generated by the proposed Project. The method of determining the number of vehicle trips assigned to the roadways is described in the following sections.

As in the calculation of vehicle trips from other developments, the Project trip generation step estimates the number of trips generated by the proposed project. This estimate is based on rates obtained from the manual on Trip Generation, by the Institute of Transportation Engineers. Table 4 shows the estimated number of trips generated by the Project for years 2005 and 2011.

Table 4. 2005 - Trip Generation For East Kapolei Project				
PHASE 1 (2005)				
Land Use	Morning		Afternoon	
	Enter	Exit	Enter	Exit
Single Family Homes	347	935	1076	632
Multi-Family Homes	181	956	959	472
Elementary School	110	74	8	8
Commercial	184	79	437	437
PHASE 2 (2011)				
Land Use	Morning		Afternoon	
	Enter	Exit	Enter	Exit
Single Family Homes	755	2035	2342	1375
Multi-Family Homes	394	2081	2087	1027
Elementary School	220	148	16	16
Commercial	268	158	874	874

PROJECTED TRAFFIC CONDITIONS

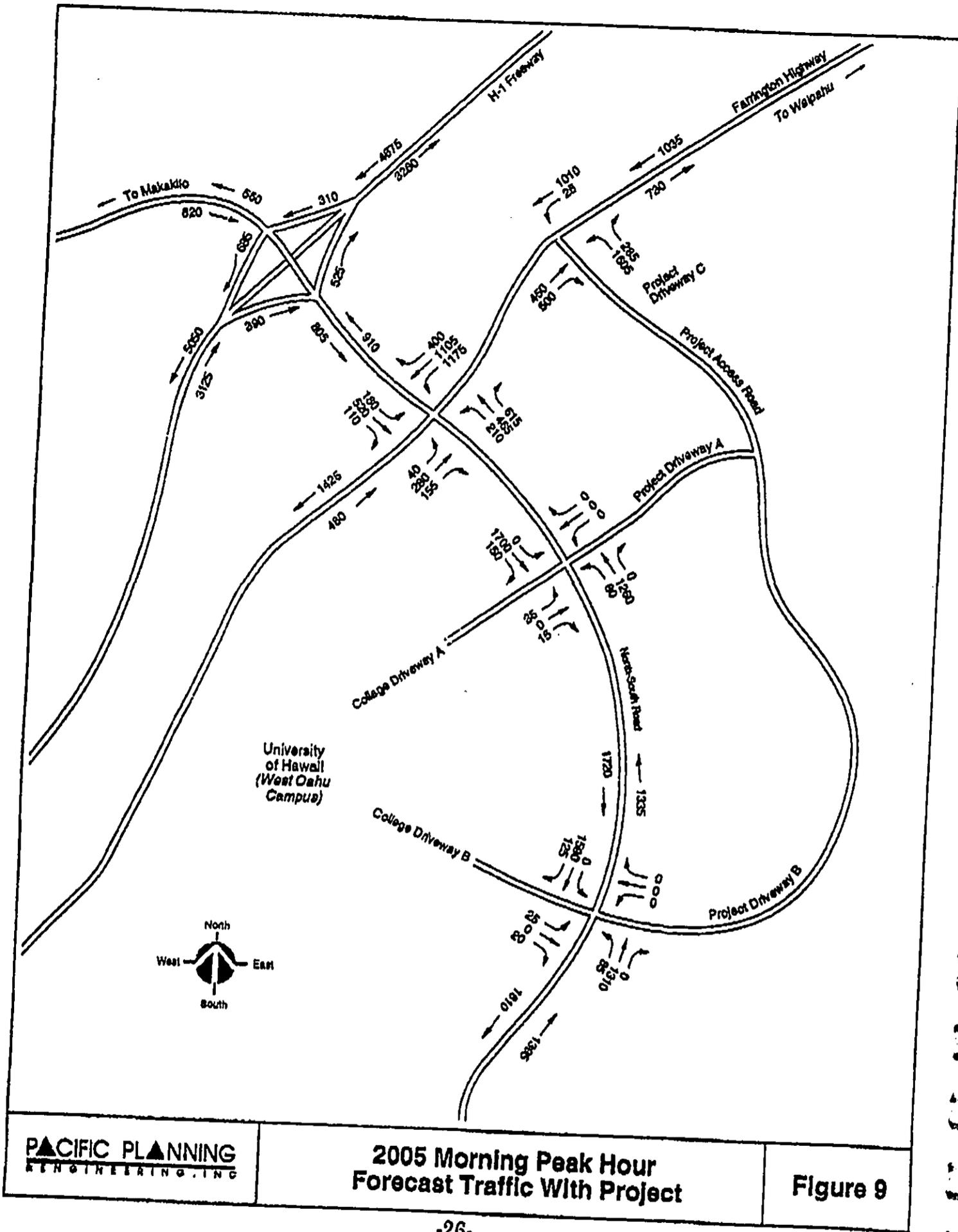
For Phase I (2005) of the Project, Figures 9 and 10 displays the "with Project" forecasts for the morning and afternoon peak hour, respectively.

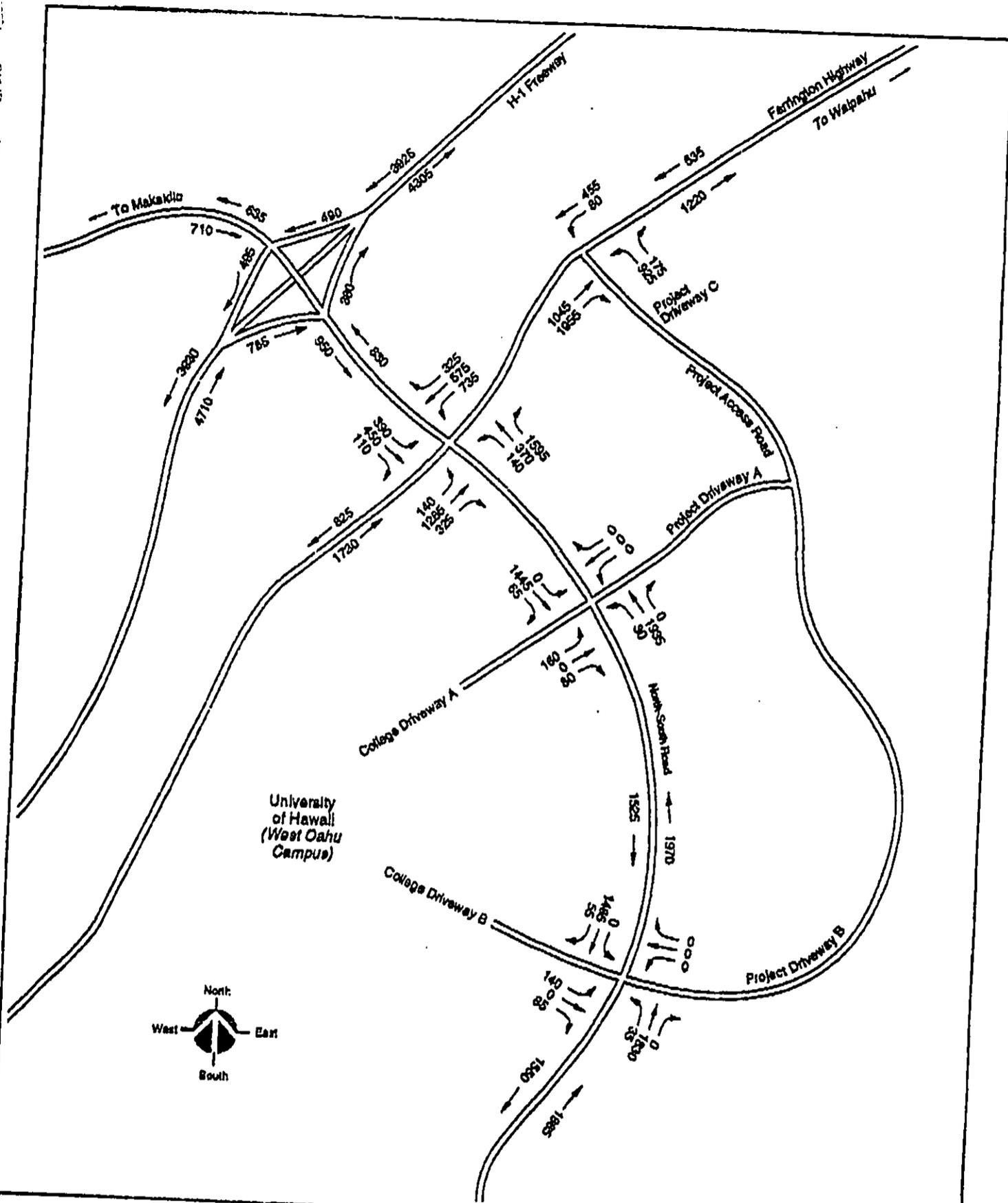
For Phase II (2011) of the Project, Figures 11 and 12 displays the "with Project" forecasts for the morning and afternoon peak hour, respectively.

The trip distribution step assigns trips to their expected origins and destinations. Trip distribution for the project was estimated based on development of the Ewa Region as the Second City of Oahu. The trips were generally distributed as shown in Table 5.

	Morning		Afternoon	
	Enter	Exit	Enter	Exit
West of Project	57	72	72	63
South of Project	30	15	18	25
East of Project	11	13	9	10
North of Project	2	0	1	2
Total	100%	100%	100%	100%

The traffic assignment step assigns trips to a specific route on the roadway network that will take the driver from origin to destination. Traffic was assigned based on the estimated shortest path or travel time from origins to destinations.

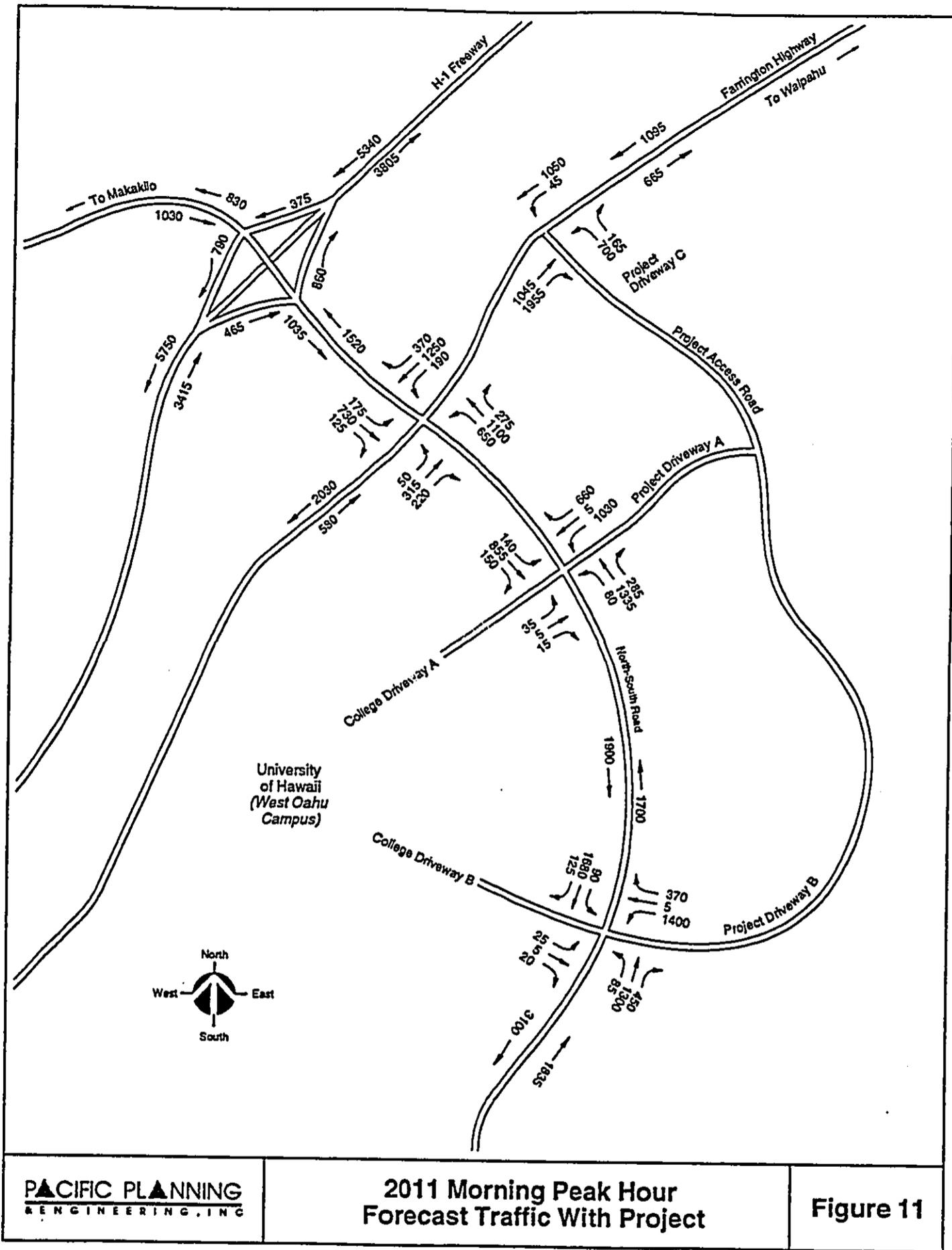




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**2005 Afternoon Peak Hour
Forecast Traffic With Project**

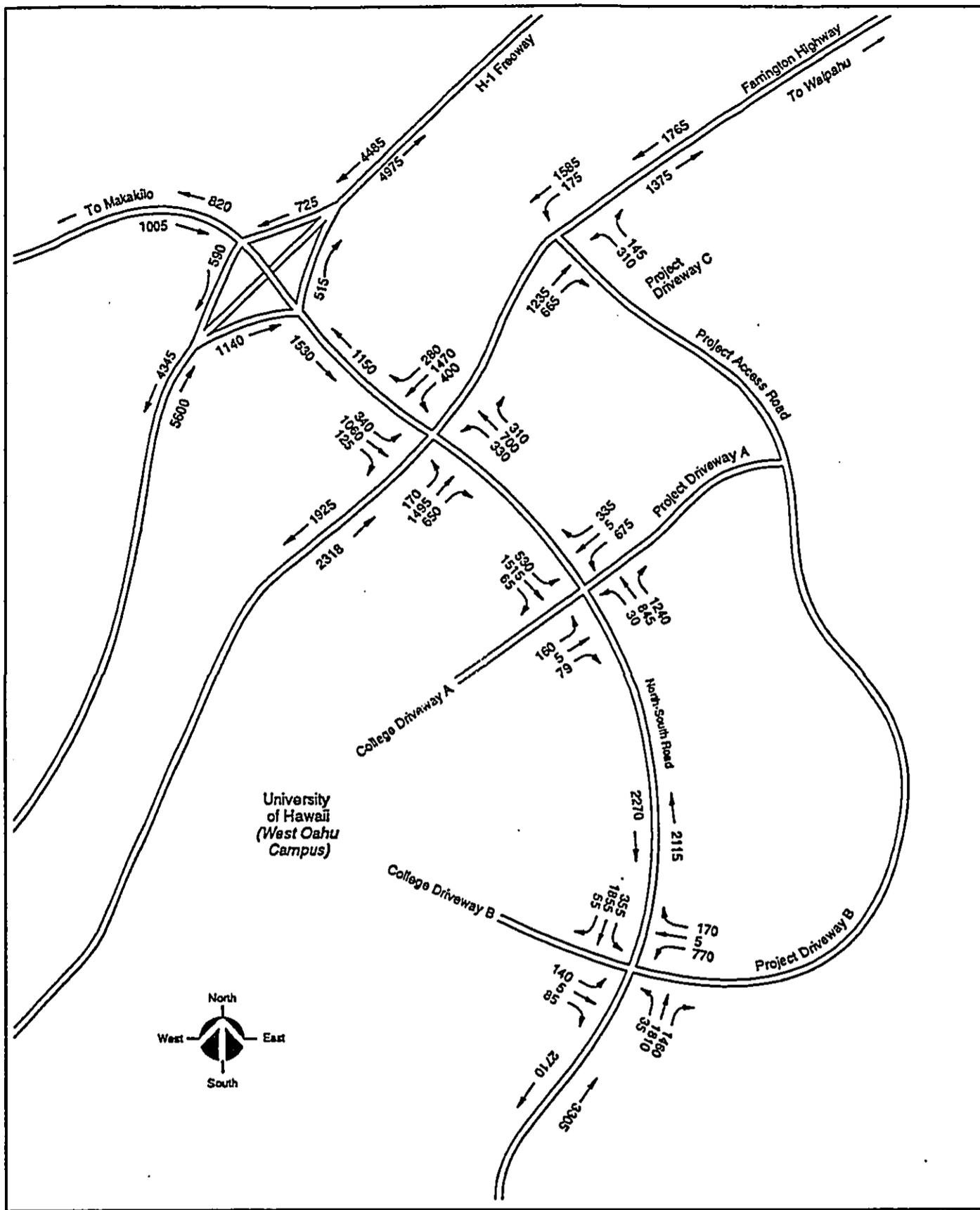
Figure 10



PACIFIC PLANNING
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**2011 Morning Peak Hour
Forecast Traffic With Project**

Figure 11



<p>PACIFIC PLANNING ENGINEERING, INC</p>	<p>2011 Afternoon Peak Hour Forecast Traffic With Project</p>	<p>Figure 12</p>
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TRAFFIC IMPACT ANALYSIS

Analyses were conducted on the study roadway facilities to determine the relative impact of the proposed project on the local roadway system and to determine improvements to mitigate the impact of the project, if necessary.

Project Impact Analysis

Analyses were conducted on the study roadway facilities to determine the relative impact of the proposed project on the roadway system. The analyses were conducted for the existing, years 2005 and 2011 forecasts "without project" and forecasts "with project" traffic conditions for the morning and afternoon peak hours.

The roadway facilities were analyzed based on the existing roadway geometrics and planned improvements. All known approved planned transportation improvements to the study facilities by the year 2005 and 2011 have been included. The major roadway additions are widening Farrington Highway to four lanes, completion of the future North-South Road, a new H-1 interchange with the future North-South Road, and addition of a lane to H-1 freeway. These major projects were identified in previous analyses conducted for the Ewa Region highway study. As noted, the current Planning Department forecasts call for lower densities than used in the aforementioned study. Thus, it is possible that not all of the above projects are needed for 2005 or 2011. A major regional study is needed to update the roadway needs for the Ewa Region.

Analysis Methods

The study roadway facilities were analyzed using methods contained in the Highway Capacity Manual (HCM). Appendix A describes in more detail the various methods of analysis used in the study.

For the study intersections, Planning Analysis was used to estimate the impact of the Project. Planning analysis is a broad evaluation of the capacity of an intersection without considering the details of signalization. It provides a basic assessment of whether or not capacity is likely to be exceeded for a given set of demand volumes and geometrics. The analysis determines whether an intersection is under, near, or over capacity.

The new H-1 interchange with the future North-South Road was analyzed using Ramp analyses methods. This method provides a Level-of-Service (LOS) which measures traffic operational conditions ranging from LOS A, good operating conditions, to LOS F, poor operating conditions.

Multilane Highway Analysis was performed on Farrington Highway east of the project site. Like Ramp analysis, a Level-of-Service (LOS) is determined.

The analyses results pertain to the following roadways:

- Farrington Highway - four lanes by year 2005.
- H-1 Freeway - eight lanes by year 2005.
- North-South Road - four lanes by year 2005

Tables 6, 7, 8, 9 and 10 summarize the results of the analysis for the "without project" and "with" project scenarios for the years 2005 and 2011.

Table 6. Planning Analysis

2005 - MORNING PEAK HOUR				
Intersection	Without Project		With Project	
	Capacity Level	Critical Volume	Capacity Level	Critical Volume
Farrington Highway / North-South Rd.	Under	971	Over	1789
North-South Rd. / Project Driveway A	Under	483	Under	963
North-South Rd. / Project Driveway B	Under	503	Under	906
North-South Rd. / Project Driveway C	n/a	n/a	Over	2112
2005 - AFTERNOON PEAK HOUR				
Intersection	Without Project		With Project	
	Capacity Level	Critical Volume	Capacity Level	Critical Volume
Farrington Highway / North-South Rd.	Under	1120	Over	1942
North-South Rd. / Project Driveway A	Under	713	Under	917
North-South Rd. / Project Driveway B	Under	703	Under	1054
North-South Rd. / Project Driveway C	n/a	n/a	Over	1530
2011 - MORNING PEAK HOUR				
Intersection	Without Project		With Project	
	Capacity Level	Critical Volume	Capacity Level	Critical Volume
Farrington Highway / North-South Rd.	Under	1092	Over	1692
North-South Rd. / Project Driveway A	Under	515	Over	1850
North-South Rd. / Project Driveway B	Under	535	Over	2340
North-South Rd. / Project Driveway C	n/a	n/a	Near	1224
2011 - AFTERNOON PEAK HOUR				
Intersection	Without Project		With Project	
	Capacity Level	Critical Volume	Capacity Level	Critical Volume
Farrington Highway / North-South Rd.	Near	1238	Over	2010
North-South Rd. / Project Driveway A	Under	751	Over	1705
North-South Rd. / Project Driveway B	Under	741	Over	2110
North-South Rd. / Project Driveway C	n/a	n/a	Under	1106

Table 7. Level of Service - 2005 Morning Peak Hour			
H-1/North-South Road Interchange			
	Study Segment	LOS without Project	LOS with Project
Eastbound	Off Ramp - Diverge Area	B	B
	Freeway Lanes Adjacent	B	B
	On Ramp - Merge Area	B	C
	Freeway Lanes Adjacent	B	B
Westbound	Off Ramp - Diverge Area	B	C
	Freeway Lanes Adjacent	C	C
	On Ramp - Merge Area	C	D
	Freeway Lanes Adjacent	C	C
Farrington Highway East of Project Driveway			
	Eastbound lanes	A	A
	Westbound lanes	B	B

Table 8. Level of Service - 2005 Afternoon Peak Hour			
H-1/North-South Road Interchange			
	Study Segment	LOS without Project	LOS with Project
Eastbound	Off Ramp - Diverge Area	C	C
	Freeway Lanes Adjacent	C	C
	On Ramp - Merge Area	B	B
	Freeway Lanes Adjacent	C	C
Westbound	Off Ramp - Diverge Area	B	B
	Freeway Lanes Adjacent	C	C
	On Ramp - Merge Area	B	C
	Freeway Lanes Adjacent	B	B
Farrington Highway East of Project Driveway			
	Eastbound lanes	B	B
	Westbound lanes	A	A

Table 9. Level of Service - 2011 Morning Peak Hour			
H-1/North-South Road Interchange			
	Study Segment	LOS without Project	LOS with Project
Eastbound	Off Ramp - Diverge Area	B	B
	Freeway Lanes Adjacent	B	C
	Freeway Lanes Adjacent	B	C
	Freeway Lanes Adjacent	B	B
Westbound	Off Ramp - Diverge Area	C	C
	Freeway Lanes Adjacent	D	D
	On Ramp - Merge Area	C	D
	Freeway Lanes Adjacent	C	C
Farrington Highway East of Project Driveway			
	Eastbound lanes	A	A
	Westbound lanes	B	B

Table 10. Level of Service - 2011 Afternoon Peak Hour			
H-1/North-South Road Interchange			
	Study Segment	LOS without Project	LOS with Project
Eastbound	Off Ramp - Diverge Area	D	D
	Freeway Lanes Adjacent	C	C
	On Ramp - Merge Area	C	C
	Freeway Lanes Adjacent	C	C
Westbound	Off Ramp - Diverge Area	B	C
	Freeway Lanes Adjacent	C	C
	On Ramp - Merge Area	B	C
	Freeway Lanes Adjacent	C	C
Farrington Highway East of Project Driveway			
	Eastbound lanes	B	B
	Westbound lanes	A	C

Analysis Results

The following is a summary based on the analysis results:

2005 Without Project

- The intersections of Farrington Highway with the North-South Road and North-South Road with College Driveways A and B all operate under capacity for the morning and afternoon peak hours.
- The planned H-1/North-South Road Interchange operates at LOS C or better during the peak hours.
- Farrington Highway east of the project operates at LOS B or better during the peak hours.

2011 Without Project

- The intersections of the North-South Road with College Driveways A and B continue to operate under capacity for the morning and afternoon peak hours. However, the intersection of Farrington Highway with the North-South Road worsens to near capacity conditions in the afternoon peak hour.
- The planned H-1/North-South Road Interchange operates at LOS D or better during the peak hours.
- Farrington Highway east of the project operates at LOS B or better during the peak hours.

2005 With Project

- The intersections of Farrington Highway with the North-South Road and Project Driveway C would be over capacity during the peak hours. The intersections of the North-South Road with Project Driveways A and B are both under capacity.
- The planned H-1/North-South Road Interchange operates at LOS D or

better during the peak hours.

- Farrington Highway east of the project operates at LOS B or better during the peak hours.

2011 With Project

- The intersections of Farrington Highway with the North-South Road and North-South Road with Project Driveways A and B would be over capacity for the morning and afternoon peak hours. The intersection of Farrington Highway with Project Driveway C would operate at near capacity conditions in the morning peak hour and under capacity during the afternoon peak hour.
- The planned H-1/North-South Road Interchange operates at LOS D or better during the peak hours.
- Farrington Highway east of the project operates at LOS C or better during the peak hours.

MITIGATION MEASURES

The intersection analyses indicate that the future traffic volumes at the study intersections will exceed planned capacity if improvements are not made. Sufficient right-of-way should be set aside to provide for future widening as development and traffic warrants. Traffic signals should be planned. Exact implementation dates depend on when traffic volumes meet established signal warrants.

Year 2005 (Phase 1)

For this scenario year, the intersections of Farrington Highway with the North-South Road and Project Driveway would need the following lanes in order to operate under or near capacity during the peak hours.

- Two left-turn lanes northbound exiting the project driveway onto Farrington Highway.
- Two left-turn lanes westbound at the intersection of Farrington Highway and the North-South Road.
- Addition of an extra through lane from about 1000' west of the intersection of Farrington Highway and the North-South Road to Project Driveway C, east of the intersection.

A road connection from the project to the planned North-South Road would mitigate traffic problems at other intersections by using all available capacity. This would relieve traffic entering and exiting the project driveway onto Farrington Highway as well as at the intersection of Farrington Highway with the North-South Road. If a connection is made, the two-left-turn lanes at the intersections of Farrington Highway with the North-South Road and Project Driveway C may not be required to handle

makai-bound traffic volumes. However, makai-bound traffic would shift to the North-South Road connection and thus this intersection would require two left turn lanes exiting the project.

Year 2011 (Phase 2)

For Phase 2, mitigative measures to the study intersections would be more involved because of the level of traffic volumes during the peak hours.

The possibility of a grade separation at the intersection of Farrington Highway and the North-South Road would increase capacity through the area. However, alternate methods of transportation should be investigated such as;

- Usage of carpools and bus service. City bus services would reduce the number of vehicles.
- Shuttle services to and from the development to areas such as Kapolei City given the relatively close proximity.
- Encouragement of other types of travel if possible (bicycles, walking, etc.) to nearby trip generators such as the college.
- Parking management strategies at major employment sites discourage use of private vehicles for commuting and encourage it for recreation, retail and service type purposes.

These type of measures would reduce the project traffic to a level that might allow for smoother traffic flow through the study intersections.

CONCLUSIONS AND RECOMMENDATIONS

The results of the traffic operations analysis indicate that the proposed East Kapolei Project will significantly change the traffic flow quality at the study intersections when the project is completed in two phases. Major road improvements have already been identified in the Ewa Region Highway Master Plan and adopted by the Oahu Metropolitan Planning Organization (OMPO). These improvements are assumed as part of the roadway network in 2005 and 2011 in the assessment of the traffic impacts.

For the year 2005 (Phase 1), in order to minimize the impact of the project and provide for smoother traffic operating conditions, we recommend the following:

- Two left-turn lanes northbound exiting the project driveway onto Farrington Highway.
- Two left-turn lanes westbound at the intersection of Farrington Highway and the North-South Road.
- Addition of an extra through lane from about 1000' west of the intersection of Farrington Highway and the North-South Road to Project Driveway C, east of the intersection.
- A project connection to the North-South Road would relieve traffic at other intersections. If a connection is made, the two-left-turn lanes at the intersections of Farrington Highway with the North-South Road and Project Driveway C may not be required to handle makai-bound traffic volumes. However, makai-bound traffic would shift to the North-South Road connection and thus this intersection would require two left turn lanes exiting the project.

CONCLUSIONS AND RECOMMENDATIONS

For the year 2011 (Phase 2), mitigative measures to the study intersections would be more involved because of the level of traffic volumes during the peak hours.

The possibility of a grade separation at the intersection of Farrington Highway and the North-South Road would increase capacity through the area. However, alternate methods of transportation actions should be investigated. A comprehensive plan that includes both Transportation System Management and Transportation Demand Management concepts should be developed for the area which would include the Project. The future traffic levels have regional sources that are undergoing current development. Integrated transit services, roadway plans and construction schedules, computer controlled traffic lights, remote parking areas, shuttle services, paratransit, bicycle and pedestrian ways, and some form of exclusive way transit should be considered in a comprehensive plan. Beyond transportation actions, the need for integrated land use planning for all the major parcels will aid in reducing the need for vehicle trips.

From a planning perspective, OMPO's current efforts to update its Long Range Plan will institute new population and traffic forecast values for the Ewa Region. The results reported herein pertain specifically to the East Kapolei Project in addition to current preliminary population estimates. This assessment approach is conservative in that the impact is greater than would be expected, as population exceeds what is set forth in preliminary figures. The OMPO's new region-wide forecasts will likely result in less impacts and roadway needs than indicated herein due to smaller values of population. A major roadway needs study is needed to update the previous study for the Ewa Region.

CONCLUSIONS AND RECOMMENDATIONS

An example of a potentially major change that should be included in the update study is the final version of the BPNAS Reuse Plan. This and other major land use proposals in the Ewa Region should be evaluated for traffic impact on a region-wide basis, and their mitigating actions included in the afore-mentioned comprehensive transportation plan. Thus, 2011 (Phase 2) impacts should be re-evaluated when those forecasts are available, and a plan be developed that not only addresses highway projects but land use planning (to obviate the need for vehicle trips) transit, and other modes and services as well.

APPENDIX A

DEFINITIONS
FOR

PLANNING ANALYSIS
MULTILANE HIGHWAY ANALYSIS
ON-RAMP AND OFF-RAMP ANALYSIS

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**DEFINITION OF PLANNING ANALYSIS
FOR
SIGNALIZED INTERSECTIONS**

Planning analysis of intersections is a broad evaluation of the capacity of an intersection without considering the details of signalization. It provides a basic assessment of whether or not capacity is likely to be exceeded for a given set of demand volumes and geometrics. At this level, only capacity is addressed because the detailed information needed to estimate delay is not available.

Planning Analysis measures a signalized intersection's capacity level using the sum of its critical movements. The total critical volume for the intersection is the sum of the critical volumes for the north-south and east-west streets. The critical volume for the intersection is compared to the criteria in the table below. The analysis determines whether an intersection is under, near, or over capacity.

Critical Volume (vehicles per hour)	Relationship to Probable Capacity
0 to 1,200	Under Capacity
1,200 to 1,400	Near Capacity
$\geq 1,400$	Over Capacity

REFERENCE: Highway Capacity Manual (Special Report 209, 1985)

DEFINITION OF LEVEL-OF-SERVICE
FOR
MULTI-LANE HIGHWAYS

Level of service for multi-lane highways is defined in terms of *density*.

Level-of-service A describes completely free-flow conditions. Maximum density is 12 passenger cars per mile per lane (pcpmpl) and the ability to maneuver within the traffic stream is high.

Level-of-service B is also indicative of free flow. The maximum density is 20 pcpmpl. Minor disruptions to flow are still easily absorbed at this level.

Level-of-service C represents a range in which the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream, and to select an operating speed, is now clearly affected by the presence of other vehicles. The maximum density is 30 pcpmpl.

Level-of-service D borders on unstable flow. Speeds and ability to maneuver are severely restricted because of traffic congestion. The maximum density is 42 pcpmpl.

Level-of-service E represents operations at or near capacity and is quite unstable. The maximum density is 67 pcpmpl. This is the minimum spacing at which uniform flow can be maintained, and effectively defined a traffic stream with no usable gaps.

Level-of-service F represents forced or breakdown flow. It occurs at a point where vehicles arrive either at a rate greater than that at which they are discharged or at a point on a planned facility where forecasted demand exceeds the computed capacity. Densities are higher than 67 pcpmpl. Queues form behind the breakdowns and are highly unstable.

REFERENCE: Highway Capacity Manual (Special Report 209, 1985)

DEFINITION OF LEVEL-OF-SERVICE
FOR
ON-RAMPS and OFF-RAMPS

Level of service for signalized intersections is defined in terms of *flow rates*.

Level-of service A: Represents unrestricted operation. Merging and diverging vehicles have little effect on other freeway flows.

Level-of-service B: Merging vehicles have to adjust their speed slightly to fill lane 1 gaps; diverging vehicles still do not experience any significant turbulence. Flow may be described generally as smooth and stable.

Level-of-service C: Both lane 1 and on-ramp vehicles must adjust their speed to accomplish smooth merging, and under heavy on-ramp flows, minor ramp queuing may occur. Some slowing may also occur in diverge areas. Overall speed and density of freeway vehicles are not expected to be seriously deteriorated.

Level-of-service D: Smooth merging becomes difficult to achieve. Both lane 1 and on-ramp vehicles must frequently adjust their speed to avoid conflicts in the merge area. Slowing in the vicinity of diverge areas is also significant. At heavily used on-ramps, ramp queues may become a disruptive factor.

Level-of-service E: Represents capacity operation. On-ramp queues may be significant. Diverge movements are significantly slowed, and some queuing may occur in the diverge area. All vehicles are affected by turbulence on freeway.

Level-of-service F: All merging is on a stop-and-go basis, and ramp queues and lane 1 breakdowns are extensive. Much turbulence is created as vehicles attempt to change lanes to avoid merge and diverge areas. Considerable delay is encountered in the vicinity of the ramp terminal, and conditions may vary widely, from minute to minute, as unstable conditions create "waves" of alternatively good and forced flow.

REFERENCE: Highway Capacity Manual (Special Report 209, 1985)

Appendix L

Proposed Revisions to Ewa DP Special Provisions

ARTICLE 3. EWA

PART I

DEVELOPMENT PLAN
SPECIAL PROVISIONS FOR EWA

SECTION 24-3.2 URBAN DESIGN PRINCIPLES AND CONTROLS FOR EWA

* * *

(b) Principles and Controls for Special Areas

* * *

(5) East Kapolei Planned Community

The East Kapolei Planned Community Special Area shall be developed with the urban uses generally identified in this subsection as an integral part of the larger growing Kapolei region. The area planned for development shall contain approximately 1,056 acres of land below Farrington Highway in East Kapolei. The area shall develop as a master planned residential community containing a mixture of residential uses; neighborhood commercial uses, public and quasi-public facilities; and park areas and facilities, all as generally shown on the Land Use Map of this Development Plan.

Development within the East Kapolei Planned Community shall be permitted in accordance with the Land Use and Public Facilities Maps of the Development Plan, and in accordance with the following development principles and standards;

(A) Residential development within the area shall be permitted to be developed as generally shown on the Land Use Map in densities ranging from single-family detached units in the 7 unit per acre net range to multi-family units in the 20 units per net acre range.

A total of about 10,000 residential units be permitted to be developed within the area.

(B) Public parks and recreation facilities within the area, shown on the Land Use Map and Public Facilities Map, as applicable, shall be developed.

(C) Supporting public facilities, infrastructure, roadways, utilities, and improvements thereto, shall be permitted to be developed in accordance with the Land Use Map and Public Facilities Map, as applicable.

(D) Permitted land uses with the area, shown on the Land Use Map, shall contain the following approximate acreages:

	<u>Acres</u>
<u>Low Density Apartment</u>	<u>902</u>
<u>Commercial</u>	<u>47</u>
<u>Public and Quasi-Public</u>	<u>16</u>
<u>Parks and Recreation</u>	<u>45</u>
<u>Major Roads (unplanned)</u>	<u>46</u>
	<u>1,056</u>

(E) Panoramic and other significant views from within and across the area shall be maintained and enhanced where possible.