PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
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DEPUTY CHIEF PLANNING OFFICER

BS

June 3, 1994

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

Gentlemen:

Final Environmental Assessment for the Proposed Laulani Commercial Center Ewa Development Plan Land Use Map Amendment from Agriculture to Commercial, TMK: 9-1-69: Por. 05, Folder No. 94/E-1

Enclosed are four (4) copies of the Final Environmental Assessment for the above project which was received by this department on May 25, 1994.

The applicant has responded to all comments received during the 30-day public review period and has included copies of the comments and responses in the Final EA.

We have determined that this project will not result in major or significant environmental impacts. However, based on the applicant's response to comments and questions related to traffic impacts, we believe that issue remains unresolved at this time.

The description of the proposed action is contained in the summary section of the attached "OEQC BULLETIN PUBLICATION FORM." Pursuant to Chapter 343, Hawaii Revised Statutes as amended, this Final EA should be published in the June 23, 1994 OEQC Bulletin.

From said 1-wtg Pec"

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

Sincerely,

ROBIN FOSTER
Chief Planning Officer

RF:ft

Attachment

1994-06-23-FEA-Lualani Commercial Center

JUN 23 1994

FILE COPY

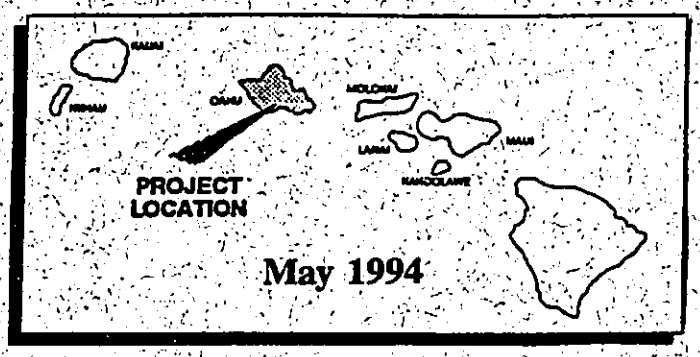
Final
Planning and Environmental Assessment

LAULANI COMMERCIAL

TMK: 9-1-69: 5 (por.)
Ewa, Oahu

Prepared for:
The Estate of James Campbell

Prepared by:
William E. Wanket, Inc.



May 1994

Final
Planning and Environmental Assessment

LAULANI COMMERCIAL

TMK: 9-1-69: 5 (por.)
Ewa, Oahu

Prepared for:
The Estate of James Campbell

Prepared by:
William E. Wanket, Inc.

May 1994

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G	Market Study *Hallstrom Group*

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LAULANI COMMERCIAL
TMK: 9-1-69: 5 (por.)

Planning and Environmental Assessment

SUMMARY

ESSENTIAL INFORMATION

Project Information

Project Name	Laulani Commercial Center
Agent	William E. Wanket, Inc. 1001 Kamokila Boulevard Kapolei Building, Suite 320 Kapolei,Hawaii 96707
Applicant	The Estate of James Campbell 1001 Kamokila Boulevard Kapolei, Hawaii 96707
Ownership	The property is owned by the Estate of James Campbell.
Location	In Ewa bounded by Fort Weaver Road on the north, Ewa by Gentry to the west, and the proposed Ewa Marina Golf Course to the south (*Figure 1, Location/Vicinity Map).*
Land Area	20 acres
TMK	9-1-69: 5 (por.)

Land Use Information

Existing State Land Use Map	Agriculture (*Figure 2*)
Existing Development Plan Land Use Map	Agriculture (*Figure 3*)
Proposed Development Plan Land Use Map	Commercial (*Figure 3*)
City Zoning	AG-2 (*Figure 4*)
Project Request	To amend the Ewa Development Plan Map from Agriculture to Commercial to develop the proposed Laulani project. The site is intended to be developed as a neighborhood shopping area, with approximately 138,000 square feet of leasable space (see Site Plan, *Figure 5*).

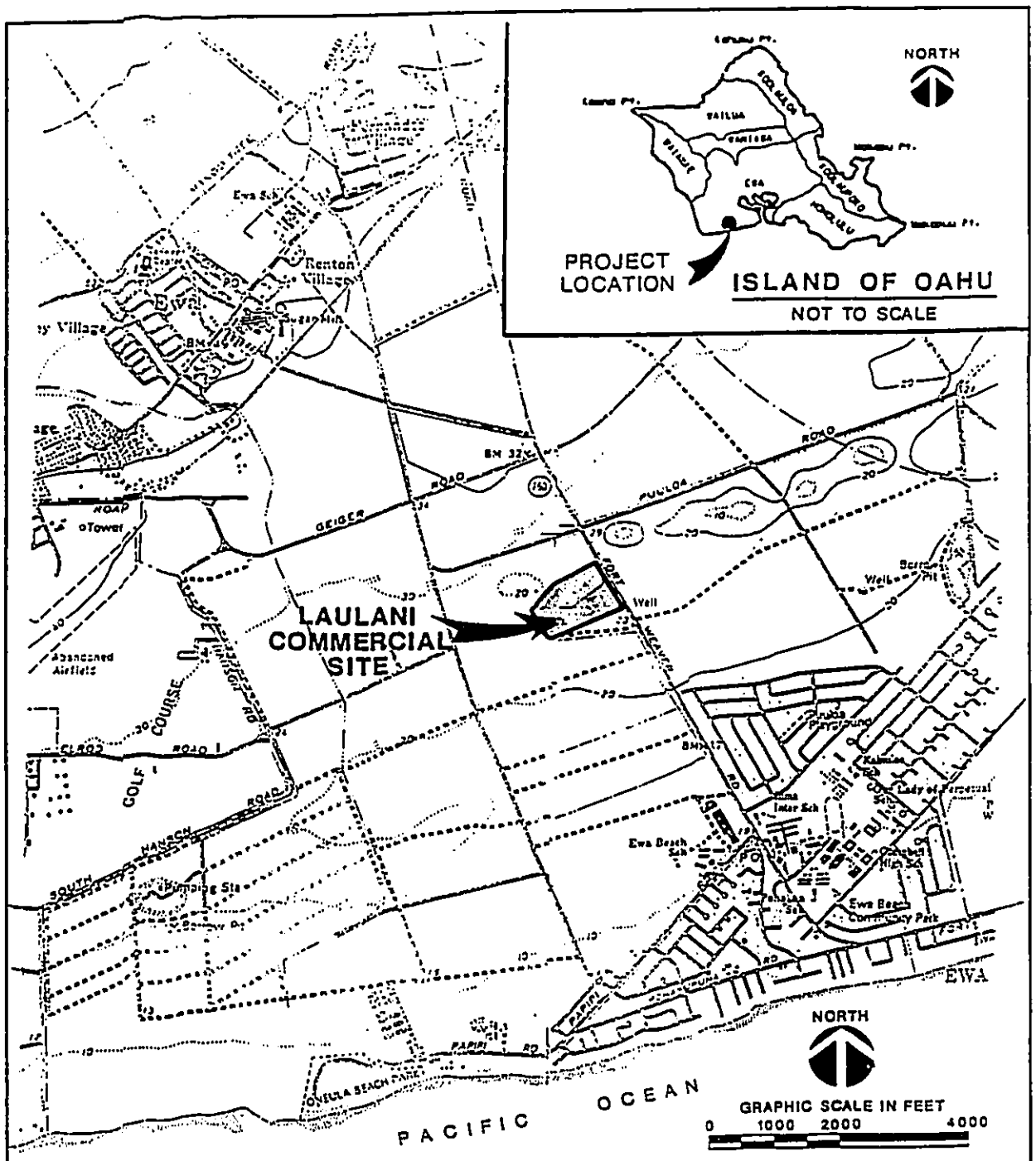


figure 1

LOCATION/VICINITY MAP
LAULANI COMMERCIAL SITE
Ewa, Oahu, Hawaii

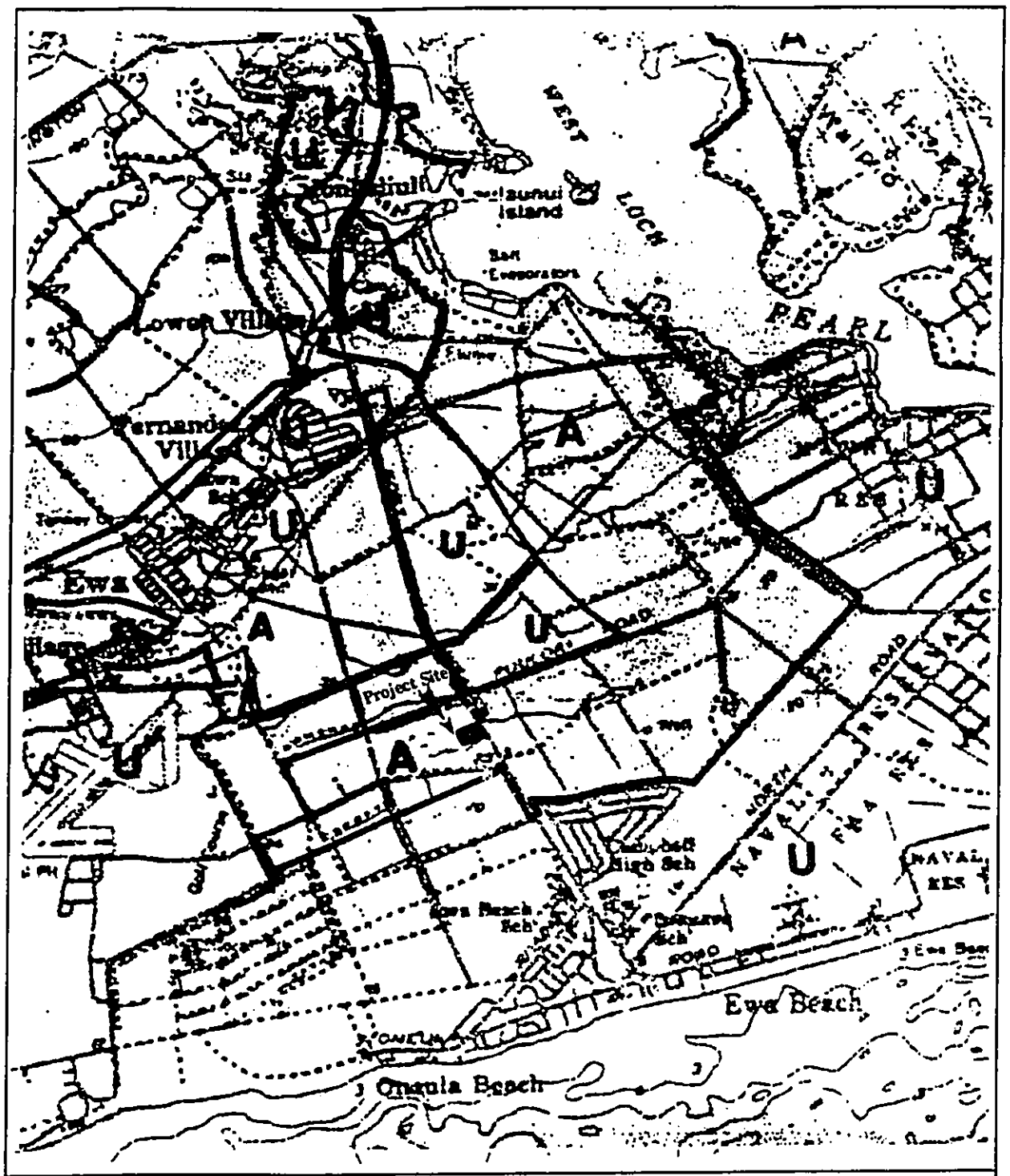
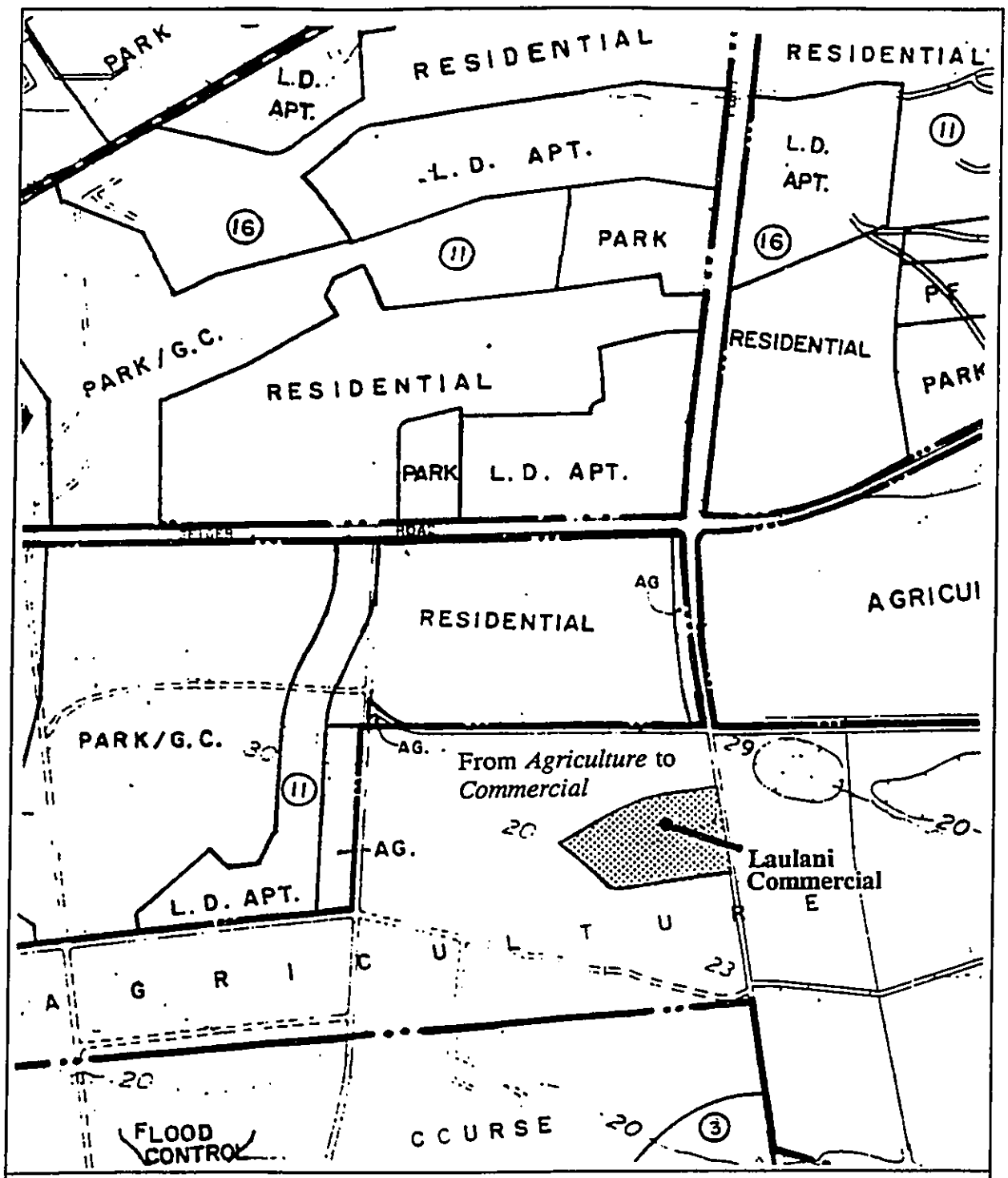


figure 2 **STATE LAND USE MAP**
LAULANI COMMERCIAL SITE
Ewa, Oahu, Hawaii



EXISTING/PROPOSED EWA DEVELOPMENT PLAN MAP
LAULANI COMMERCIAL SITE
figure 3 **Ewa, Oahu, Hawaii**

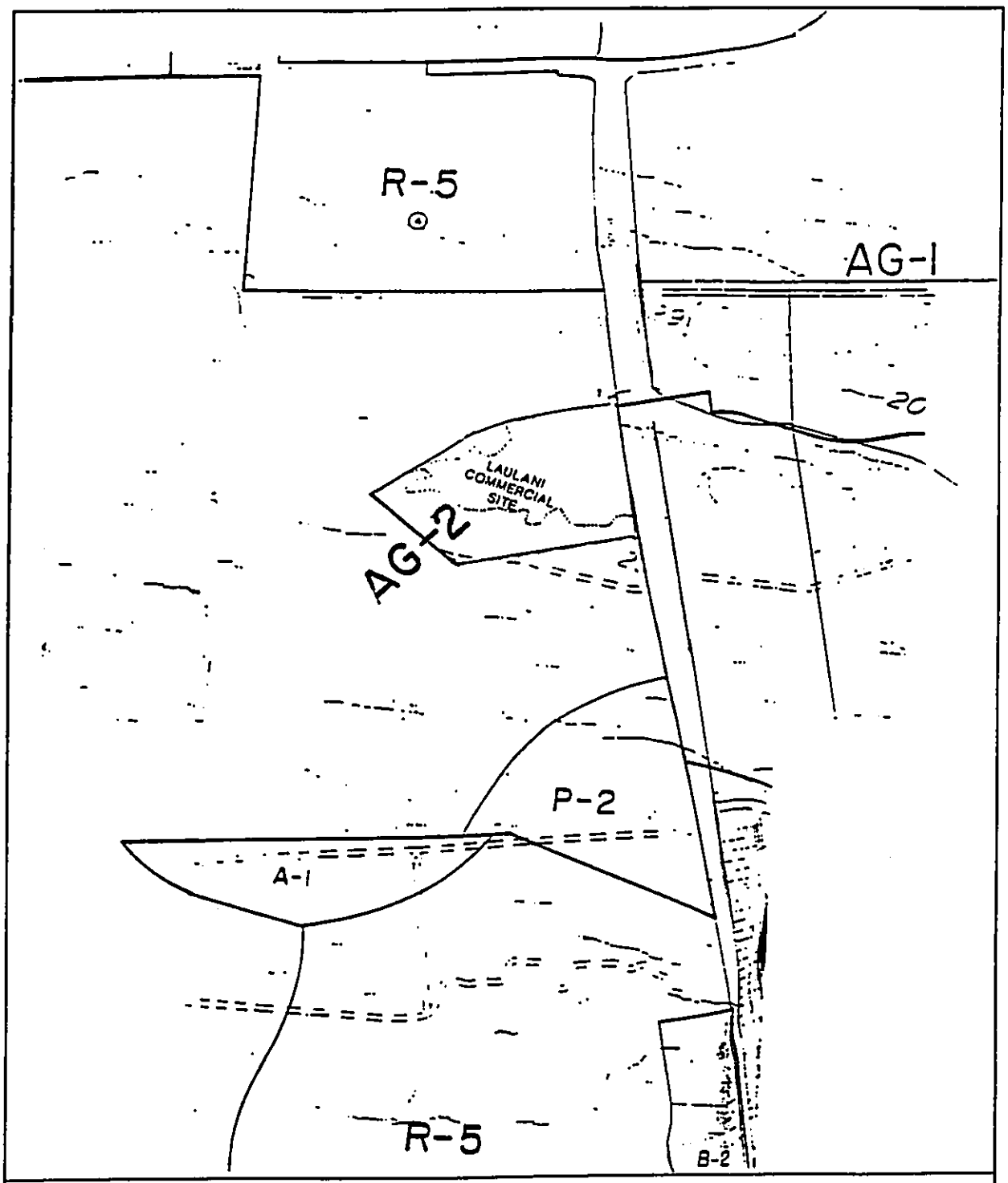


figure 4 **PORTION OF EXISTING ZONING MAP**
LAULANI COMMERCIAL SITE
Ewa, Oahu, Hawaii

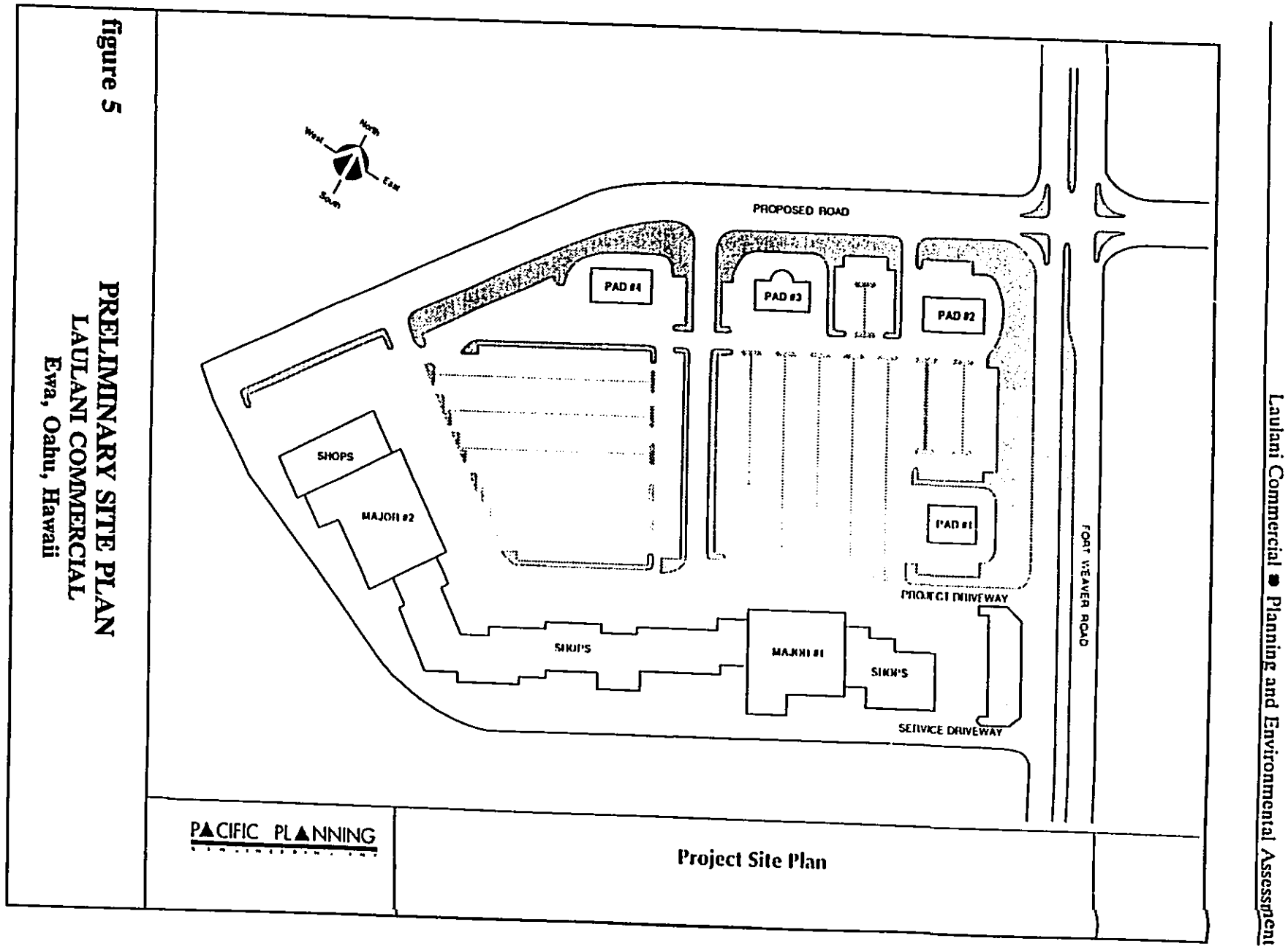


figure 5

PRELIMINARY SITE PLAN
LAULANI COMMERCIAL
Ewa, Oahu, Hawaii

LAULANI COMMERCIAL

Final Planning and Environmental Assessment

1.0. INTRODUCTION

The Estate of James Campbell is proposing to develop the Laulani neighborhood shopping center on approximately 20 acres of land in Ewa identified by Tax Map Key 9-1-69: 5 (por.), Land Court Application 1069. Implementation of the project requires redesignation of these acres from Agriculture to Commercial on the Ewa Development Plan Land Use Map, amendment of the State Land Use Boundary Map from Agriculture to Urban, and eventual rezoning from AG-2 to B-1. This document complies with the Planning Department's guidelines for preparation of a DP Amendment Environmental Assessment. The guidelines are included as *Exhibit 1*. Further, this EA is also in compliance with the procedures of Act 241, SLH 1992.

1.1. Project Background

Historic documents indicate that the entire *ahupuaa* of Honouliuli was once owned by M. Kekauonohi, the granddaughter of King Kamehameha I. Upon her death, portions of the land, including the project area, were sold to James Campbell. Ownership of the project site has been since held by the Estate of James Campbell.

In 1991, the Department of Housing and Community Development (DHCD) proposed the project, *Laulani/Fairways*, a master-planned residential project on 301.18 acres of land that included a 20-acre neighborhood shopping center. By this proposal the Estate retained ownership of the commercial acreage.

Due to subsequent plan revisions, the project was halted prior to the OEQC publication of the Draft Environmental Impact Statement (DEIS). The Estate is now proposing to develop their own stand alone commercial area in generally the same location as previously envisioned.

Several of the studies prepared for the *Laulani/Fairways* DEIS, however, remain appropriate to this project and are referenced in this report, with permission of DHCD. Other studies have been revised to reflect project-specific information and are contained in this document as Appendices.

APPENDIX	STUDY/PREPARER
A	Archaeological Reconnaissance Report *Bishop Museum, Anthropology Department*
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C	Noise Assessment Study *Darby & Associates*
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G	Market Study *Hallstrom Group*

Excerpts from studies (listed below) prepared for the Laulani/Fairways DEIS are referenced in appropriate sections of this document.

Social Impact Assessment
Earthplan

Botanical Survey, Laulani/Fairways Subdivision
Char & Associates

Avifauna and Feral Mammal Survey
Phillip L. Bruner

View Assessment
PBR/Park Engineering

As evidenced by information contained in this document, the proposed development will not adversely affect the environmental, agricultural, recreational, cultural, historical, scenic, flora and fauna or other resources of the project area.

1.2. Project Planning Perspective

The commercial project, part of the Estate's overall master plan for the region, will be providing commercial services for the residents of the surrounding area communities of Ewa Beach, Ewa Gentry, West Loch, Ewa Marina, the military housing at Iroquois Point, and future developments destined for the area. The proposed 20-acre site is planned as a low-density shopping center with approximately 138,000 square feet of leasable space. Two major tenants, along with smaller retail stores and fast food/restaurant tenants, are expected to be established in the center. Access to the project will be from Fort Weaver Road. Access improvements are provided in Section 3.5.3. and 6.6.

1.3. Pre-Assessment Consulation/Notification Letter

The following agencies and community groups were consulted in the preparation of the

EA in compliance with the requirements of Hawaii Administrative Rules, §11-200-9 (early consultation) and Ordinance 84-111 (notification requirements). An asterisk (*) indicates that a comment has been received. Comments and responses are included as *Exhibit 2.*

Federal

Department of the Navy*
U.S. Department of Agriculture, Soil Conservation*
U.S. Department of Transportation, Airports District Office*

State

Department of Agriculture
Department of Health*
Land Use Commission*
Office of State Planning*
Department of Land and Natural Resources
Department of Transportation*
Office of Environmental Quality Control*
University of Hawaii, Environmental Center

City

Board of Water Supply*
Department of Land Utilization
Department of Public Works*
Department of Wastewater Management*
Honolulu Police Department*
Department of Human Resources*
Department of Parks and Recreation*
Department of Transportation Services*
Honolulu Fire Department*
Planning Department

Public Officials/Community Groups

The Honorable John DeSoto
The Honorable Brian Kanno
Ewa Neighborhood Board No. 23
Oahu Sugar Company
Haseko (Hawaii) Inc.
American Lung Association
The Honorable Annelle C. Amaral
The Honorable Paul T. Oshiro
Ewa Beach Community Association
Gentry Development Company
The Myers Corporation*
West Oahu Employment Corporation

Public Untility Companies

Hawaiian Electric Company, Inc.
The Gas Company
Hawaiian Telephone Company

1.4. Draft Environmental Assessment Comments and Responses

The Draft EA was published in OEQC's February 8, 1994 and February 23, 1994 Bulletin. Comment letters were received from the City and County of Honolulu Planning Department and the Department of Transportation Services. These letters along with responses are included as Exhibit 3.

2.0. PROPERTY DESCRIPTION

2.1. Existing Use

Sugar cane, cultivated by Lessee Oahu Sugar Company, Ltd., occupies the site. The lease is due to expire in 1995.

2.2. Surrounding Uses

The 20-acre project site is located along Fort Weaver Road below the existing Ewa by Gentry - West development (see *Figure 1*). The Hawaii Prince Golf Course is located across Fort Weaver Road to the east, the proposed Ewa Marina development is located to the south, and the Barbers Point Naval Air Station is to the west.

2.3. Topography / Slopes

The natural topography of the project site is flat, with scattered mounds and depressions. Natural elevations range from a high of approximately 26 feet mean sea level (MSL) at the northern corner of the site to approximately 23 feet MSL at the southern corner (*Figure 6*). Natural slopes from flat to 5 percent, with an average slope across the site of about 0.2 percent in the north-south direction. The topographic features of the commercial site are characteristic of the overall features of the vicinity.

2.4. Climate

The climate in the project site area is typical of the warm, dry climate found in the Ewa Plains. Tradewinds from the northeast occur much of the time, with occasional Kona winds.

The normal temperature range for the area is from the high 60s (Fahrenheit) to the low 90s. Rainfall is light, with an average annual rainfall of approximately 20 inches.

2.5. Soils

According to the Soil Survey by the U.S. Department of Agriculture, Soil Conservation Service, the major soil types existing on the project site are as follows:

- Ewa silty clay loam (EmA), moderately shallow, 0 to 12 percent
- Mamala stony silty clay loam (MnC)

These soils are typical of the soils found in the low lying areas cultivated in sugar cane. *Figure 7* provides identification of soil types in the vicinity of the project site.

2.6. Grading and Soil Erosion

2.6.1. Grading

Due to the flat nature of the site, the proposed development will likely require embankment over the 20 acres. It is anticipated that fill, ranging in depths of 2 to 5 feet, will be needed to facilitate drainage of the site.

2.6.2. Calculation of Soil Erosion Potential

The U.S. Department of Agriculture, Soil Conservation Service utilizes the Universal Soil Loss Equation (USLE) to estimate long-term average annual soil losses from sheet and rill erosion. The equation is used to estimate erosion on forest land, farm fields, construction/development sites, and other areas. Soil loss equation considers rainfall, soil erodibility,

ground cover and management, ground slope and length of overland flow.

The existing soil erosion potential for the 20-acre project site is estimated to be 34 tons per year using the USLE. After development, the soil erosion potential from the site is estimated to be 0.38 tons per year.

2.6.3. Impacts and Mitigation

Based on the USLE, long-term soil erosion potential at the project site should decrease substantially after development. This decrease in soil erosion is attributed to the reduction of erodible surfaces (increase in buildings and pavement). The estimated long-term reduction in soil erosion potential is over 33 tons per year, or over 99 percent after development.

Short-term soil erosion potential during construction is estimated by the USLE at 198 tons for grading over a one year period. The following mitigative measures will reduce the estimated erosion potential for the project site by 43 percent to 113 tons.

- Limit grading to not more than 15 consecutive acres at a time;
- Installation of a 10,000 sq. ft. siltation basin at the onset of construction;
- Use of a combination of structural controls such as filter inlets and berms, sediment traps, chutes and flumes, containment dikes, or other suitable practices.

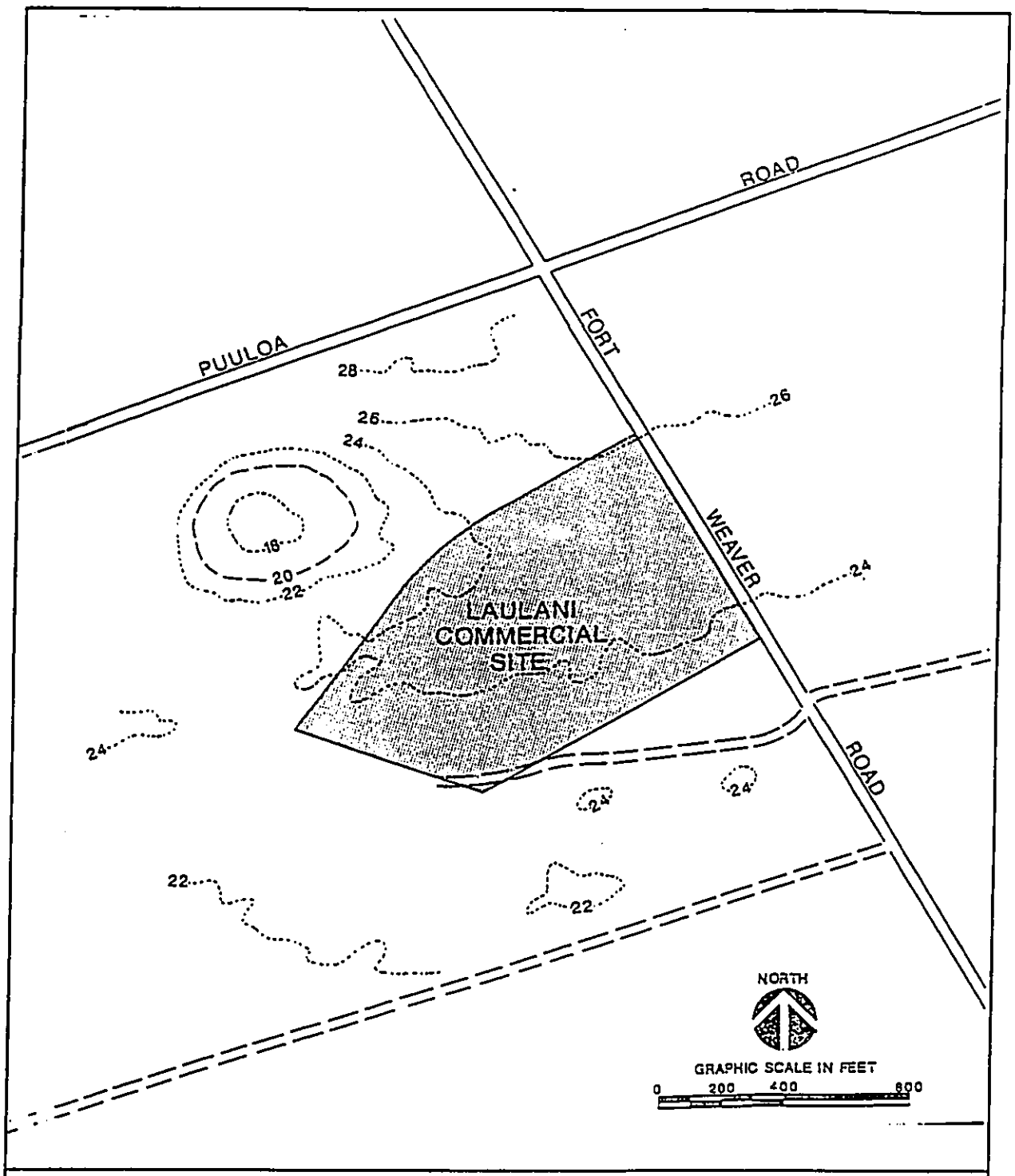

figure 6

TOPOGRAPHIC MAP
LAULANI COMMERCIAL
Ewa, Oahu, Hawaii

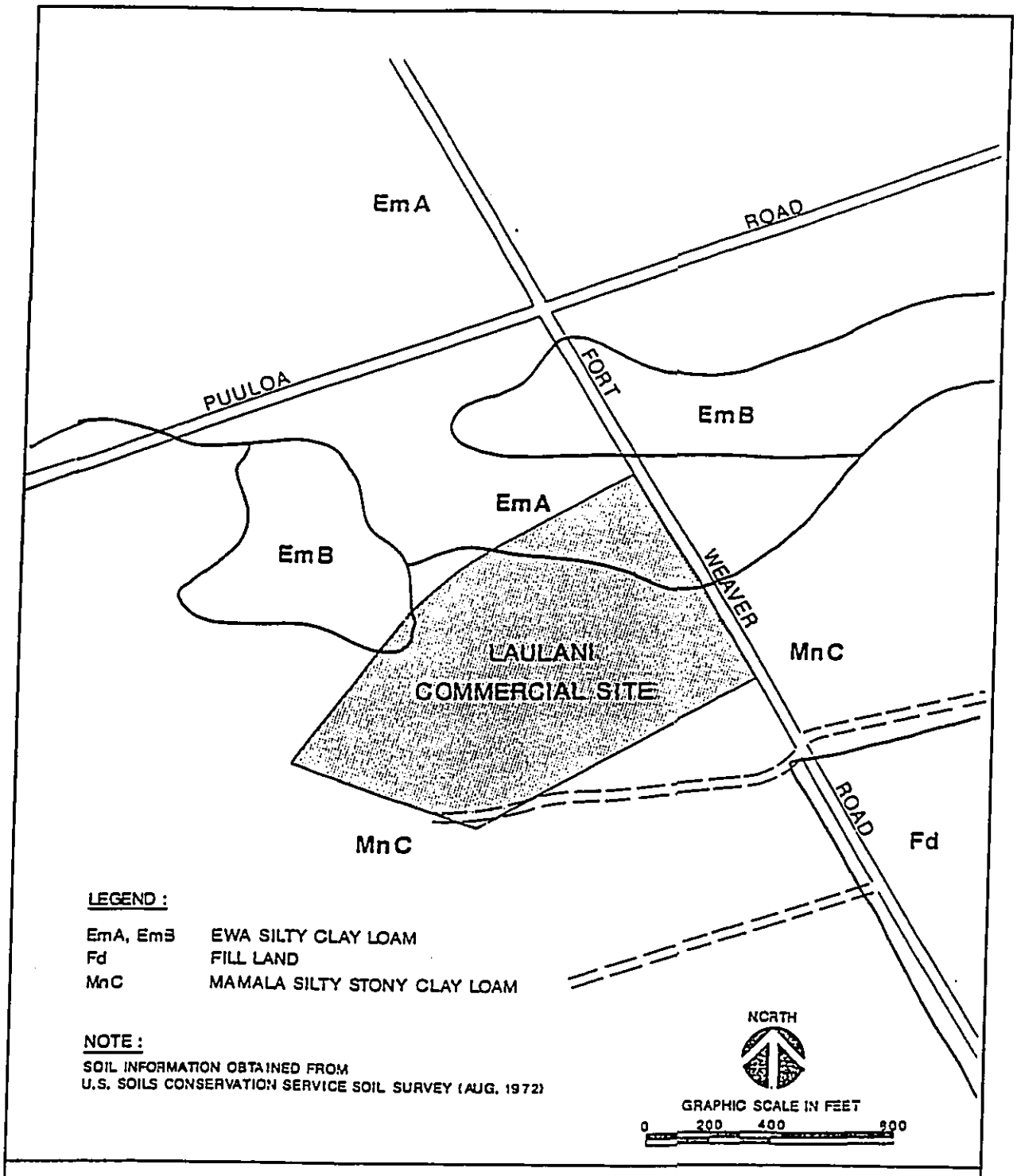

figure 7

SOILS MAP
LAULANI COMMERCIAL
Ewa, Oahu, Hawaii

Other erosion controls to further lessen the short-term erosion impacts during construction will be implemented such as: minimizing construction time; use of temporary sprinklers in nonactive construction areas; stationing water trucks onsite during construction to provide immediate sprinkling in active construction zones; use of temporary berms and cut-off ditches; thorough watering of graded areas after construction activity has ceased for the day and on weekends; sodding or planting slopes immediately after grading work has been completed. Grading and Erosion Control Plans will be prepared in compliance with Chapter 23, *Revised* Ordinances of Honolulu. A National Pollutant Discharge Elimination System permit, which includes a Best Management Practices plan to minimize impacts, will also be obtained for applicable construction activities which result in a discharge into waters of the State.

3.0. DEVELOPMENT PROPOSAL

3.1. Proposed Use

The proposed shopping facility is expected to contain approximately 138,000 square feet of leasable space, with associated parking (see Section 3.5.2.). Tenants may include such establishments as: a supermarket, drug/variety/hardware stores, specialty shops, a bookstore, ice-cream/yogurt parlors, clothing stores, hair salons, a video rental store, a veterinarian clinic, a pet store, a garden supply store, branch banks, and eating establishments etc.

The site configuration and its location were selected to mitigate potential traffic and noise issues, and to serve anticipated future residential growth in the area. The site plan incorporates substantial landscaped areas and setbacks from roadways, wide interior walkways, individual building pads, and a separate service roadway behind buildings. As a result, the site size and design of the proposed Laulani Commercial Center were based on the recently completed and successful Kapolei Shopping Center that was developed on approximately 20 acres, but with slightly less leasable building area.

The Kapolei Area Long Range Master Plan shows the project site and surrounding lands proposed for future residential and commercial development. The proposed commercial project was part of an overall residential and commercial project known as Laulani/Fairways considered for development by the City's DHCD. Thus, this project represents the commercial component situated in the general area proposed for the overall Laulani/Fairways development. Proposals for the development of surrounding lands continue to be considered as is the DHCD's housing project.

3.2. Development Schedule

It is anticipated that after various land use approvals have been obtained, construction on the shopping center could be completed in 1998.

3.3. Development Costs

The preliminary cost estimate for the project site improvements are estimated to be approximately $6,500,000, including earthwork. Offsite improvements are estimated to cost approximately $3,000,000, and includes a temporary wastewater pump station, force main, offsite access/road improvements, and temporary drainage improvements. Total buildout costs are expected to amount to approximately $24 million.

3.4. Project Need

A Market Study for the project has been prepared by the Hallstrom Group, Inc.. The study analyzes the demand for the proposed Laulani commercial development, which is intended to serve the surrounding residential communities and compliment the rapidly changing Kapolei/Ewa region by enhancing the available neighborhood shopping alternatives in the area. The study is summarized below and attached to this document as *Appendix G.*

3.4.1. Existing Commercial

The only commercially oriented property within close proximity to the subject site is the Ewa Beach commercial center anchored by the Ewa Beach Shopping Center which is over 50 years old. The center is slated for upgrading and possible expansion, but a timetable has not yet been established.

3.4.2. Commercial Expansion

The only new commercial retail space within the region is the recently completed Kapolei Shopping Center. Containing 134,387 square feet, the first tenant to open for business was a 46,000 square foot Safeway store in late 1992. The shopping center experienced rapid absorption and is nearly completely occupied with just over 10,000 square feet and one pad site vacant. Located in close proximity to the community of Makakilo, residents were overjoyed to finally have commercial support services near their community.

The Kapolei City Center will be home to many government offices. The master plan currently calls for nine state offices and a judiciary complex all to be completed on a 40-acre parcel donated by Campbell Estate. The City and County government is also receiving 40 acres within the Kapolei City Center for development of City and County offices. The James Campbell building, containing 54,000 square feet was recently completed and the Campbell Estate has moved its headquarters from Downtown Honolulu to Kapolei. The Kapolei Building, adjacent to the James Campbell Building, is completed and portions of its 67,500 square feet are ready for occupancy.

Ewa Marina has a commercial segment which is an integral component of the overall development. Construction on the marina is slated to commence in 1995, with completion 24 months hence. The developers do not envision any of the commercial facilities being developed within the next ten years at this project.

The Ewa by Gentry development recently received a development plan amendment to redesignate a 10.5 acre residentially zoned site for commercial use. If the site was utilized for commercial purposes and zoned B-1, studies show that the site would not adversely impact the feasibility of the commercial space within the subject market study, but would only alleviate some of the demonstrated shortage.

Commercial expansion in West Oahu has been fairly significant in the past year with the opening of Waikele Center, and the Hawaii Power Center. These centers feature national value retailers and factory stores and have a statewide consumer base. These centers are not considered competitive with the proposed neighborhood shopping character of the Laulani site. Although residents travel from all parts of the island (and even neighbor islands) to visit the large-scale "power centers," the immediate needs of the community surrounding the Laulani project are not being served by currently existing and proposed neighborhood retail centers.

3.4.3. Ewa/Kapolei District Commercial Supply/Demand

The demand for commercial real property uses in the Ewa/Kapolei District is substantial, currently and as projected over the next two decades. The historically under-serviced region is undergoing unparalleled development as the District becomes the focal point for islandwide development.

The current supply of available finished space is very low, and quality developable acreage holdings are scarce. While substantial inventory is proposed over the long-term, it is focused on areas not in close proximity to the subject site, which would serve the surrounding residential expansion (much of which is already in place) as well as the residents of the older Ewa Beach community. Additionally, the ability of these master-planned projects to meet all segments of market demand is unlikely, particularly as demand from elsewhere on Oahu will be directed to the District and Ko Olina visitors create pressure for tourism-oriented businesses.

The most critical period is over the short-term; servicing currently unmet demand and the additional demand over the next several years as the population/consumer base increases as more residential projects are completed and before major commercial projects proposed for the region come on-line.

The existing and proposed supply is insufficient to meet current and projected demand levels, especially over the next three to five years.

The Laulani commercial segment is located appropriately for the proposed commercial designation, physically and competitively. Having in-place infrastructure, excellent access potentials and supporting residential development, makes it a particularly favorable location for meeting existing unmet and short-term market demand. The proposed rezoning of the 20-acre Laulani site is justified by market indicators and a prudent addition to the regional land use inventory.

3.5. Development Approvals

The project requires the following major land use approvals:

Application	Approving Agency
▸ Land Use Boundary Change to Urban	State Land Use Commission
▸ Development Plan Amendment	Honolulu City Council
▸ Zone Change	Honolulu City Council

3.6. Development Standards

3.6.1. Heights

The Development Plan Special Provisions for Ewa, as amended, reflect the heights for all commercial area [other than the West Beach Special Area (§24-3.2(a)(3)] as 60 feet. The Applicant will comply with this requirement.

3.6.2. Parking

The LUO requires 1 stall per 300 square feet of shopping center space. By this calculation, approximately 460 stalls are needed at the minimum. Traffic calculations contained in this document have been based on 750 stalls, the number being proposed by the Applicant.

3.6.3. Access and Circulation

Vehicular access to the project will be provided via the addition of a fourth leg (project access road) to the existing T-intersection of Fort Weaver Road with the Prince Golf Course Access Road and two new driveways along Fort Weaver Road (see Section 6.6., *Traffic*).

3.6.4. Landscaping

The shopping area will be landscaped with trees and other plantings.

3.7. Hours of Operation

The center is expected to have operating hours similar to other shopping centers, e.g., 9:00-10:00 a.m. to 8:00-9:00 p.m. Morning shift will begin about 8:00 in the morning. About 50 to 100 employees can be expected to be working during off-business hours.

3.8. Number of Employees

The project is expected to create approximately 550 jobs, based on 4 jobs per 100 square feet for the 138,000 square foot complex. Section 5.2 (*Impact on State and County Revenues and Expenditures*) contains information on employment generated by the proposed project.

4.0. CONFORMANCE TO FEDERAL, STATE AND CITY PLANS AND PROGRAMS

This Section analyzes the relationship of the project with existing public plans, policies, and controls of the State and the City and County of Honolulu.

4.1. State

4.1.1. Hawaii State Plan

The Hawaii State Plan (Chapter 226, Hawaii Revised Statutes, as amended) consists of a series of goals, objectives, and policies which serve as a guide for the growth and development of the State. Principles or values integral to the overall theme of the Plan [Sec. 226-3 HRS] are:

- Individual and family self-sufficiency;
- social and economic mobility
- community or social well-being

The plan details objectives and policies in various areas such as population, the economy, physical environment, facility systems, and socio-cultural.

In this section the proposed project is analyzed with respect to relevant State Plan goals, objectives, and policies. The State's goals address a strong viable economy characterized by stability, diversity, and growth; a physical environment characterized by beauty, cleanliness, quiet stable natural systems, and uniqueness; and physical, social, and economic well-being for individuals and families in Hawaii [Sec. 226-4, HRS].

Population

Sec. 226-5 - Objectives and Policies for Population

(a) It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.

(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.

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

Sec. 226-104 - Population growth and land resources priority guidelines.

(a)(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.

(b)(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from other areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.

Comment - The project lies in an area where State and City and County policies encourage population growth and continued urban development. Adequate support services and facilities are available or will be provided through the development of the project. The physical characteristics of the site are suitable for the intended development. A variety of jobs will become available during and after development.

Economy - General

Sec 226-6 - Objectives and Policies for the Economy.

(a)(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

(b)(6) Strive to achieve a level of construction activity responsive to and consistent with growth objectives.

(b)(10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.

Comment - The 20-acre neighborhood shopping center is intended to serve the shopping and service needs of the surrounding residential communities of Ewa Beach, Ewa Villages, Ewa Gentry, West Loch, Ewa Marina, the military housing at Iroquois Point and future developments proposed for the area. The ultimate size of the shopping facility is expected to be approximately 138,000 square feet.

Employment will be generated by the proposed development. According to the study on fiscal impacts prepared by Decision Analysts Hawaii, Inc. (*Appendix B)*, it is expected that the shopping center will provide approximately 550 jobs. Construction employment is expected to average about 45 jobs.

Agriculture

Sec. 226-7 - Objectives and Policies for the Economy - Agriculture.

(a)(1) Continued viability in Hawaii's sugar and pineapple industries.

(a)(2) Continued growth and development of diversified agriculture throughout the State.

(b)(6) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.

Sec. 226-103 - Economic priority guidelines.

(c)(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.

(d)(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.

Comment - Although the project site is currently planted with sugar cane, the lease held by Oahu Sugar Company, Ltd. expires in 1995. The company has announced its intention to cease sugar operations. However, according to a previous study prepared by Decision Analysts Hawaii, Inc. for Laulani/Fairways, which included the project site, that project: (1) would not affect the amount of land available for diversified agricultural activities and (2) would not limit the growth of diversified agriculture since, in other parts of the State, far more agricultural land has been released from plantation agriculture than has been absorbed by other activities.

Physical Environment

Sec. 226-11 - Objectives and policies for the physical environment--land-based, shoreline, and marine resources.

(b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(b)(8) Pursue compatible relationships among activities, facilities, and natural resources.

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

(b)(5) Encourage the design of development and activities that compliment the natural beauty of the islands.

Sec. 226-13 - Objectives and policies for the physical environment--land, air, and water quality.

(b)(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people.

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

Sec. 226-104 - Population growth and land resources priority guidelines.

(b)(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.

(b)(12) Utilize Hawaii's limited land resources, providing adequate land to accommodate population and economic growth needs while insuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.

Comment - Development of the area is consistent with State and County policies of directing commercial development to Ewa, whiie respecting the character of the surrounding area. Noise impact and air quality assessments have been prepared for the project and are included as *Appendices C* and *D* respectively.

Topography, climate, views, and other physical constraints and attributes of the site will be considered during final planning and design of the structures. Sensitive interface with neighboring land uses will also be included in the final design of the development.

Facilities

Sec. 226-16 - Objective and policies for facility systems--water.

(b)(1) Coordinate development of land use activities with existing and potential water supply.

Comment - The proposed potable water system will be designed in accordance with the BWS water system standards and is anticipated to be dedicated to the BWS for operation and maintenance. A water master plan for the Laulani development, including the project site, will be prepared and submitted to BWS for their review and approval.

Education

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

(b)(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.

Comment - The Estate of James Campbell is a member of the West Oahu Employment Corporation (WOEC) and is assisting in the funding of that organization. In cooperation with other organizations, the WOEC is helping to improve the qualifications of residents for various types of employment, ranging from entry-level positions to management positions.

4.1.2. State Functional Plans

The Hawaii State Plan directs the appropriate State agencies to prepare functional plans for their respective program areas. The plans set forth policies, statewide guidelines and priorities within specific fields of activity and serve as the primary implementing vehicle of the Hawaii State Plan. Following is a discussion of applicable functional plans.

Agriculture

The State Agriculture Functional Plan focuses on (1) continued viability in Hawaii's sugar and pineapple industries, and (2) continued growth and development of diversified agriculture throughout the State.

The entire site is designated Agriculture on the State Land Use Map. Fields of sugar cane, cultivated by Oahu Sugar Company, Ltd., (OSCo) presently occupy the project site. The project, however, would not conflict with the intent of the State Agriculture Functional Plan which is not to preserve agricultural lands simply for the sake of preserving them--preservation is to occur only if a potential need for these lands exists. OSCo intends to cease cultivation of the fields when their leases expire in 1995.

Employment

The State Employment Functional Plan's major objectives are to: (1) improve the qualifications of entry-level workers and their employment transition; (2) develop and deliver education, training, and related services to ensure and maintain a quality and competitive work force; 93) improve labor exchange; (4) improve the quality of life for workers and families; and (5) improve the planning of economic development, employment, and training activities. The employment generated by the proposed development, to varying degrees, addresses each of these concerns.

Energy

The State Energy Functional Plan is prepared and maintained by the State Department of Business, Economic Development, and Tourism. The objectives of the plan are to achieve dependable, efficient, and economical statewide energy systems capable of supporting the needs of people, and increasing energy self-sufficiency.

Health

The State Health Functional Plan focuses on public health priorities under the jurisdiction of the State Department of Health. The area contains numerous medical clinics and doctor's offices, and hospital; ambulance and emergency services are available nearby. Customers and employees of the proposed development are expected to be adequately served by the existing medical facilities.

Environmental issues relating to the State Health Functional Plan have been addressed in this report, in part, by the studies relating to air quality, noise impacts, and the adequacy of public facilities and services. Where adverse impacts have been identified, appropriate mitigative measures have been proposed.

Transportation

The primary transportation objectives are to provide: (1) an accessible, integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods; and (2) a statewide transportation system consistent with the planned growth objectives throughout the state.

The project is being designed to accommodate ease of ingress and egress and safe, efficient movement for commercial patrons and employees. A Traffic Impact Study was performed for the project by Pacific Planning and Engineering, Inc. and is presented in Section 6.6. and *Appendix F.*

4.1.3. State Land Use Law

Chapter 205-17 of the Hawaii Revised Statutes (HRS) set forth: (1) applicable standards for determining urban district boundaries and (2) statewide concerns which should be considered in reclassification procedures. Following is a discussion of the project's relationship to these standards and concerns.

Conformance with Urban District Boundary Standards

(Sec. 205-17[2], HRS and Administrative Rules, Title 15, Chapter 15 - Land Use Commission Rules, 18 - Standards for Determining Urban Boundary).

It shall include lands characterized by "city-like" structures, streets, urban level of services, and other related land uses.

Proximity to centers of trading and employment except where the development would generate new centers of trading and employment.

Comment - The project site is located within the planning area of the City's Ewa Development Plan that is targeted to be the secondary urban center of Honolulu.

Existing and developing major employment centers within this area include Campbell Industrial Park, Barbers Point Harbor, Ko Olina Resort, Kapolei Business Park, City of Kapolei Commercial District, and the Barbers Point Naval Air Station.

Further, the project will generate new entrepreneurial opportunities. Employment generated is estimated to be approximately 550 jobs.

Substantiation of economic feasibility by the petitioner.

Comment - The economic feasibility of the project is demonstrated in the financial information prepared by Decision Analysts Hawaii, Inc. (*Appendix B*, Section 5.2.)

Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection.

Sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection.

Comment - The proposed site is adjacent to existing urban areas. Public services and facilities are available to serve the project. Other adjacent lands, owned by the Applicant, could provide a reserve for future growth.

Include lands with satisfactory topography and drainage and reasonably free from danger from floods, tsunami, unstable soil conditions, and other adverse environmental effects.

Comment - The project with improvements will be suitable for commercial uses, as described in Section 6, Public Facilities.

Land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on state or county general plans.

It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the state and county general plans.

It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services.

Comment - The project adjoins lands in the urban district and is part of the region targeted as the island's secondary urban center. Urbanization of this land would not contribute to spot urban development.

Statewide Concerns to be Considered in Reclassification
(Sec. 205-17 [3], HRS)
Preservation or maintenance of important natural systems or habitats.

Comment - The site contains no habitats of rare or endangered flora or fauna. Sections 7.1. and 7.2. provides information on the project site's flora and fauna.

Maintenance of valued cultural, historical, or natural resources.

Comment - As described in Section 7.6, extensive disturbance has been recorded with a marked lack of cultural or paleontological remains. This disturbance is the result of extensive sugar cane cultivation in the area for a long period of time.

Maintenance of other natural resources relevant to Hawaii's economy, including, but not limited to, agricultural resources.

Comment - The project site is presently planted in sugar cane by Lessee Oahu Sugar Company, who intends to cease operations on the site at the termination of their lease in 1995.

Provision for employment opportunities and economic development.

Comment - The construction of the Laulani project and the commercial uses planned for it will provide employment opportunities and economic development. The project is expected to create approximately 550 jobs and generate entrepreneurial opportunities.

4.1.4. Coastal Zone Management (CZM)

The objectives and policies of the Hawaii Coastal Zone Management (CZM) Program are included in the Shoreline Protection Act of 1975 (Sec. 205A-2), Hawaii Revised Statutes (Supplemented). The CZM area refers to the waters from the shoreline to the seaward limit of the State's jurisdiction and all the land areas excluding those lands designated as state forest reserves. The Special Management Area (SMA) is land extending inland from the shoreline as delineated on City and County SMA maps. It is generally limited to a narrow coastal strip. The project site is not in the SMA. The project's compliance with the relevant objectives of the Hawaii CZM Program are outlined below:

(b)(5) Economic Uses - Provide public or private facilities and improvements important to the State's economy in suitable locations.

Comment - The proposed development will provide opportunities for new and expanding businesses. The development will also stimulate economic activity through a multiplier effect. The Laulani project is expected to have a positive impact on the area's economy.

4.2. City and County

4.2.1. General Plan

The proposed Ewa Development Plan Land Use Map Amendment relates to the objectives and policies of the City and County's General Plan (as amended) as follows:

Population

Objective C To establish a pattern of population distribution that will allow the people of Oahu to live and work in harmony.

Policy 2 Encourage development within the secondary urban center at Kapolei and the Ewa and Central Oahu urban-fringe areas to relieve development pressures in the remaining urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center.

Comment - The requested change from Agriculture to Commercial is consistent with public policies and the concept of growth in the secondary urban center. This commercial development is supportive of the residential growth policies of the General Plan.

Economic Activity

Objective A To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.

Policy 1 Encourage the growth and diversification of Oahu's economic base.

Objective G To bring about orderly economic growth on Oahu.

Policy 1 Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei.

Policy 2 Permit the moderate growth of business centers in the urban fringe areas.

Comment - In addition to short-term construction related jobs, the neighborhood shopping center is expected to provide employment and entrepreneurial opportunities for small businesses. After the proposed project is completed, employment at full operation is projected to be approximately 800 to 1,100 jobs (see *Appendix B* for further discussion on Employment).

Natural Environment

Objective B To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

Policy 2 Protect Oahu's scenic views, especially those seen from highly developed and heavily travelled areas.

Comment - The project will not adversely impact ocean or scenic view planes within or through the project site. The project is also not expected to adversely affect the broad, panoramic makai views and sense of open space as seen from certain portions of the H-1 Freeway.

Transportation and Utilities

Objective D To maintain transportation and utility systems which will help Oahu continue to be a desirable place to live and visit.

Policy 2 Use the transportation and utility systems as a means of guiding growth and the pattern of land use on Oahu.

Policy 5 Require the installation of underground utility lines wherever feasible.

Comment - A major consideration in public policy is to redirect commuter traffic flowing into the primary urban center by providing alternative employment centers outside of the existing urban core. The project meets this criteria and will be accessible to public transportation.

Infrastructure systems to serve the project will be designed to meet all governmental requirements, and utilities, whenever practical, will be placed underground. Section 6 describes the infrastructure needs and plans for the development.

Physical Development and Urban Design

Objective A To coordinate changes in the physical environment of Oahu to ensure that all new developments are timely, well designed, and appropriate for the areas for which they will be located.

Policy 2 Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.

Objective C To develop a secondary urban center in Ewa with its nucleus in the Kapolei area.

Policy 2 Encourage the development of a major residential, commercial, and employment center within the secondary urban center at Kapolei.

Objective D To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.

Policy 1 Develop and maintain urban-fringe areas as predominantly residential areas characterized by generally low rise, low density development which may include significant levels of retail and service commercial uses as well as satellite institutional and public uses geared to serving the needs of households.

Comment - The proposed project will provide commercial services and jobs which will be available to conveniently serve residents of the secondary urban center. Final design of the project will consider all land use components, including roadways and adjacent developments.

4.2.2. Development Plan

Development Plans serve as an intermediate means of implementing the objectives and policies of the General Plan by providing relatively detailed guidelines for the physical development of the island. The project site is located in the Ewa Development Plan Area.

Common Provisions - Section 24-1.4, General urban design principles and controls

This section of the Common Provisions discusses the importance of public views, open space, landscaping and other design principles and controls.

(a) *...public views shall be protected by appropriate...controls....* No development shall be permitted that will block important public views.

(b) ...open space areas are to provide visual relief and contrast to the building environment....

(c) Landscaping controls shall be established for ground-level parking areas in order to provide pleasing environments and to help minimize the visual dominance of paved surfaces.

Comment - The site will be landscaped and maintained with trees and other plantings. The project will not affect viewing corridors or impede the visibility of any scenic landmarks.

Special Provisions - Sec 24-3.1, Area Description

This section of the Development Plan for Ewa recognizes the intent to encourage area development:

(b) The Ewa area's population of 37,000 in 1985 constituted 4.6% of the islands total population. Relevant General Plan policies for Ewa encourage the development of a secondary urban center in order to relieve development pressures in the urban-fringe and rural areas.

(c) It is the intent of the Ewa Development Plan to provide a guide for orderly and coordinated public and private development in a manner that is consistent with general plan provisions.

Comment - The proposed project will provide beneficial services and area jobs for the projected growing population of the Ewa area.

Land Use Map

The project area is designated Agriculture on the Ewa Development Plan Map (see *Figure 3).*

4.2.3. City and County Zoning

The project site is currently zoned AG-2 (*General Agriculture District).* Subsequent to the change of the State land use designation from Agriculture to Urban, a change in zoning designation to reflect the planned commercial use will be required.

4.3. The Estate of James Campbell Ewa Master Plan

The Estate of James Campbell, in cooperation with area developers and community organizations, maintains a long-range master plan to coordinate developments on their lands. The Laulani project is consistent with the master plan, which provides for commercial development on the project site.

5. SOCIO-ECONOMIC ASSESSMENT

This chapter addresses the project's impact on the community environment, its impact on agriculture, and the effects on State and County finances.

5.1. Social Impact Assessment

5.1.1. Profile of the Existing Community

The study area for this report is the Ewa Development Plan area. The Ewa region's primary employment generator in 1985 was military activity. Military jobs were the largest category with about 39 percent of the total 11,121 jobs held in Ewa. Service jobs were the next largest category; 16 percent of the total jobs were service-related. Approximately half of the jobs in the Ewa region were located at the Naval Air Station, Barbers (NASBP).

The Ewa region experienced population growth double the Oahu rates over the past twenty years. Ewa's population has grown from 24,087 persons in 1970 to 38,324 in 1980 to 42,983 in 1990. This means that the area grew 4.2 percent a year in the 1970s and 1.7 percent a year in the 1980s. These rates are about double the islandwide rates. From 1970 to 1980, Oahu's population grew at an average rate of 1.9 percent, and the islandwide rate dropped to slightly less than one percent from 1980 to 1990.

In 1990, Ewa had 11,734 housing units. Unlike the islandwide steady increase of multi-family units, Ewa's housing supply continues to be dominated by single-family units which account for 82 percent of the total housing stock. While the 1990 median values of owner-occupied homes were lower in Ewa when compared to islandwide statistics, median rent exceeded the Oahu median. The highest rents were found in two of the relatively newer communities, Makakilo and Ewa Gentry, which exceeded the island median by about $300.

In spite of high rents, however, Ewa region homes were sought after, as indicated by very low vacancy rates. Whereas Oahu had a total vacancy rate of 5.8 percent, Ewa Beach and Makakilo had rates of less than half the islandwide figure, with 2.1 and 2.4 percent respectively. Demographic and household characteristics are summarized as follows:

Ethnicity and Age

The older communities in Ewa retain a few distinctions from the Oahu averages with regard to ethnicity. Ewa Villages and Ewa Beach are well represented by people of Asian and Pacific island ancestry, with 89 and 73 percent, respectively, in this category. NASBP and Iroquois Point Puuloa (IPP), Military Family Housing have significantly high proportions of Caucasians (76 and 80 percent respectively). Ewa Gentry, the area's newest community, has ethnic proportions similar to Oahu.

Ewa region communities tend to be slightly younger than the Oahu-wide community. The military communities are the youngest. NASBP has a median age of 24.7 years; IPP 25.6 years. With a median age of 32.4 years, Ewa Villages is the only community in the area which exceeds the islandwide median age of 32.2 years.

Family Households

In 1990, 74 percent of Oahu's total households were family households. Most of Ewa's communities exceeded this proportion. The highest proportion of family households was found in IPP Military Family Housing (98.1 percent), followed by Ewa Villages (88.8 percent) and Ewa Beach (88.6 percent). Ewa Gentry was the only community with a proportion lower than that of the island, with only 71 percent of its households being family households.

Household Size

Ewa has traditionally had larger-than-average households, and the 1990 Census reveals a continuation of this trend in the region's older communities. The largest households were found in Ewa Beach (4.26 persons) and Ewa Villages (4.19 persons). The average islandwide household is 3.02 persons. The only community with households smaller than the islandwide average was Ewa Gentry, with an average household size of 2.81 persons.

5.1.2. Likely Scenario without Laulani

Without the commercial project, the following scenario is likely to occur:

Significant increase in residential population

The target population for Ewa is between 119,940 and 132,934 persons in 2010. This population projection implies an increase of 77,000 to 90,000 people over the next 20 years, or between 70 and 109 percent. On the average, the annual growth rate would be between 3.0 and 3.8 percent.

Significant increase and diversity in employment

Projections estimate that job opportunities within the region are expected to increase about 600 percent over a 20-year period (Leventhal, 1986). Whereas, the major job generators in Ewa are military and service in nature, future area employment sources will likely resemble a cross-section of Oahu's proportions. Major job generators will be located at the City of Kapolei, the industrial parks, Ko Olina, and the Commercial/Industrial mixed use complex of Ewa Marina.

Establishment of city-related mixed uses and secondary urban center in "western" Ewa

City of Kapolei, Ko Olina, and the James Campbell Industrial Park, all situated in the western half of the Ewa region, are major employment generators, essentially creating the city-like "Secondary Urban Center," environment as defined by the City's General Plan. The nearby

residential communities include the Villages of Kapolei, Makakilo, and Honokai/Nanakai Gardens.

Change in land use pattern in eastern Ewa

The City and County of Honolulu General Plan generally designates the eastern half of Ewa (the area along Fort Weaver Road), as Ewa's urban fringe and this area is intended primarily for residences. Recently, the General Plan was amended to include the non-residential use of visitor accommodations and a Commercial/Industrial Mixed Use complex at the Ewa Marina project.

Without the Laulani project, eastern Ewa will be primarily residential in character with an urban node at Ewa Marina.

Major increase in public services and facilities

Concurrent with the development of the various Ewa communities will be governmental response to accommodate the growing population. Schools, police and fire stations, and public parks will be added as appropriate, and infrastructure, such as roadways will be improved.

Land banking in eastern Ewa

The State is reserving over 2,000 acres in eastern Ewa for future uses.

5.1.3. Potential Social Impacts of the Laulani Project

Impacts on social characteristics of the Ewa region

As the project is being built, the existing community will have already undergone a gradual adaptation to the influx of new people. Many changes will be occurring by the time the project is implemented.

New communities are emerging in the vicinity of the project site, including Kapolei, West Loch, and Ewa by Gentry. As these communities emerge, Ewa's regional identity will probably change. Formerly, communities generally operated independently of each other; events were community and neighborhood centered, rather than regional in nature. While this community-centered pattern will probably continue, there also may be increased efforts to deal with the larger Ewa region as new communities become part of Ewa. In a sense, the distance between the communities is "lessening" and interaction between long-time and newer residents is more likely as people shop at stores, attend schools and churches, and play in parks together. As a result of these changing patterns, Ewa residents may increase efforts to establish and work toward goals and on issues common to all of the communities to solve problems effectively.

As the project is built, the Ewa region is expected to begin experiencing an increased employment diversity. Many unemployed and currently employed people working in other parts of Oahu will seek jobs which are expected to become available in Ewa. The new residents of Ewa Marina, Ewa by Gentry, West Loch, and other developments will also be competing for the same jobs. This period of adjustment to a new lifestyle will be difficult for current residents who need jobs but lack training. Potential for further compounding the frustrations of long-time residents will be working for new management from a different cultural group.

Project-related effects

The project is expected to be compatible with the nearby communities. It will generate jobs during construction and provide long-term employment for current and new residents of the area, and the entire island. Finally, the project will provide convenient shopping for existing and new residents alike.

5.2. Fiscal Impact Assessment

A study assessing project impacts on State of Hawaii and City & County of Honolulu revenues and expenditures has been prepared by Decision Analysts Hawaii, Inc. The report is included as *Appendix B.* Values provided below are expressed in 1993 dollars.

Construction is projected to continue over approximately a 2-year period, with the total construction cost estimated at about $24.2 million for all onsite and offsite improvements and buildings, but excluding the value of the land, interest costs, and sales commissions. Profits from construction are estimated at $1.9 million. Construction employment is expected to average about 45 jobs, with total construction payroll of about $2 million per year. Construction figures will fluctuate greatly from one month to the next, depending upon the phase of construction.

At full development, the property-tax base for the Laulani 20-acre commercial site is estimated to be about $34.5 million. Retail sales are estimated at $48.3 million per year, rents at $3.3 million per year, and profits at $2.6 million per year. On-site employment is projected to be about 550 jobs with a payroll of about $10.2 million per year.

Project Assumptions

Assumptions, relevant to the analysis, have been made about the project and are provided on the next page.

ITEM	AMOUNT
PROJECT DESCRIPTION	
Land Area	20 Acres
Floor Area	138,000 square feet
CONSTRUCTION ACTIVITY	
Duration of Construction	2 years
Construction Cost (Estimated at 70% of Increased Property Tax Base, from below. Construction costs exclude the value of land, interest costs, legal fees, etc.)	$ 24.2 million
Profit from Construction Activity (8% of Construction Costs)	$ 1.9 million
Average Construction Employment (1 man-year per 1,500 sf of commercial space)	45 jobs
Average Payroll ($43,500 per job)	$ 2.0 million
INCREASED PROPERTY TAX BASE ($250 per sf)	$ 34.5 million
RETAIL SALES, RENTS AND PROFITS	
Retail Sales ($350 per sf)	$ 48.3 million per year
Rents ($2 per sf per month)	$ 3.3 million per year
Total Retail Sales and Rents (subject to Excise Tax)	$ 51.6 million per year
Profit on Retail Sales and Rents (5%)	$ 2.6 million per year
OPERATING EMPLOYMENT AND PAYROLL	
Employment (4 jobs per 1,000 sf of commercial space)	550 jobs
Payroll ($18,500 per job)	$ 10.2 million per year

5.2.1. State Revenues and Expenditures

Existing Revenues

Currently, the State derives negligible tax revenues from the sugar operations on the property inasmuch as sugar is exempt from excise taxes, and Oahu Sugar Co., Ltd. is marginally profitable. The sugar operations, along with taxes they generate, are scheduled to end in 1995.

Projected Revenues from Construction Activity

Construction activity is expected to generate a total of about $1.1 million in excise taxes and corporate-income taxes. Additional construction-related revenues to the State will include individual income taxes which are not estimated.

Revenues, Full Development

At full development, the increase in State tax revenues is expected to be about $2.3 million per year, with about $2.1 million per year being derived from excise taxes and about $200,000 per year derived from corporate income taxes.

Projected Expenditures - Capital Improvements and Debt Service

No major State-financed facility to support the project is anticipated beyond that which already exists, or which will be built in any case. For example, State highways and freeway interchanges are to be improved or built to support new residential communities in Ewa, with or without the project. Furthermore, these road improvements are to be financed by developers in Ewa, including the "fair-share" contribution of Campbell Estate. Correspondingly, State debt service for support improvements will be negligible.

Project Expenditures - Services

Additional State services required to support the project are expected to be negligible. This includes such major expense categories as: general government, freeway maintenance, health services, welfare, education, and housing.

Projected Net Revenues

Net revenues to the State will amount to about $1.1 million in taxes from construction activity, and about $2.3 million per year once the project is fully developed.

5.2.2. Mitigating Measures and Unresolved Issues - State

In view of the beneficial impact on State finances, mitigating measures are not necessary. Furthermore, there are no unresolved issues.

5.2.3. City and County of Honolulu

Existing Revenues

Currently, the County derives about $150 per year from property taxes on the entire parcel when used for agriculture.

Projected Revenues - Rollback Taxes

An estimated $100,000 in "rollback" taxes will become due when the property is developed. Rollback taxes are levied on land which has been assessed and taxed at its agricultural value but which is then developed; this tax cover 10 years of back property taxes based on the difference between taxes computed on the marked assessment and the agricultural assessment, plus a penalty of 10 percent.

Revenues, Full Development

At full development, County property taxes from the Laulani 20-acre commercial site are expected to reach about $300,000 per year. Other County taxes and fees--such as the weight-tax on delivery trucks, and liquor licenses and fees--are not estimated.

Projected Expenditures - Capital Improvements and Debt Service

No major County-financed facility to support the project is anticipated beyond that which already exists, or which will be built in any case. The project will not require any new police

or fire stations beyond those which will be built in any case. Correspondingly, County debt service for support improvements will be negligible.

Services

Additional County services required to support the project are expected to be negligible. Tenants will finance on-site security and private refuse collection. Other services will be provided in the area with or without the project, *including police, fire, road, maintenance,* park maintenance, bus service etc. Finally, user charges will finance other services, such as water-delivery costs.

5.2.4. Projected Net Revenues

Net revenues to the County will amount to about $100,000 in rollback taxes, and about $300,000 per year once the project is fully developed.

5.2.5. Mitigating Measures and Unresolved Issues - City and County of Honolulu

In view of the beneficial impact on County finances, mitigating measures are not necessary. Furthermore, there are no unresolved issues.

6. PUBLIC SERVICES AND FACILITIES

Information from the Preliminary Engineering Report prepared by Engineering Concepts, Inc., and the Traffic Impact Assessment prepared by Pacific Planning and Engineering, Inc., is summarized below and contained at *Appendices E* and *F* respectively.

6.1. Drainage

6.1.1. Existing Conditions

The project site is designated Zone D by the Flood Insurance Rate Map (FIRM), indicating areas in which flood hazards are undetermined (see *Figure 8*).

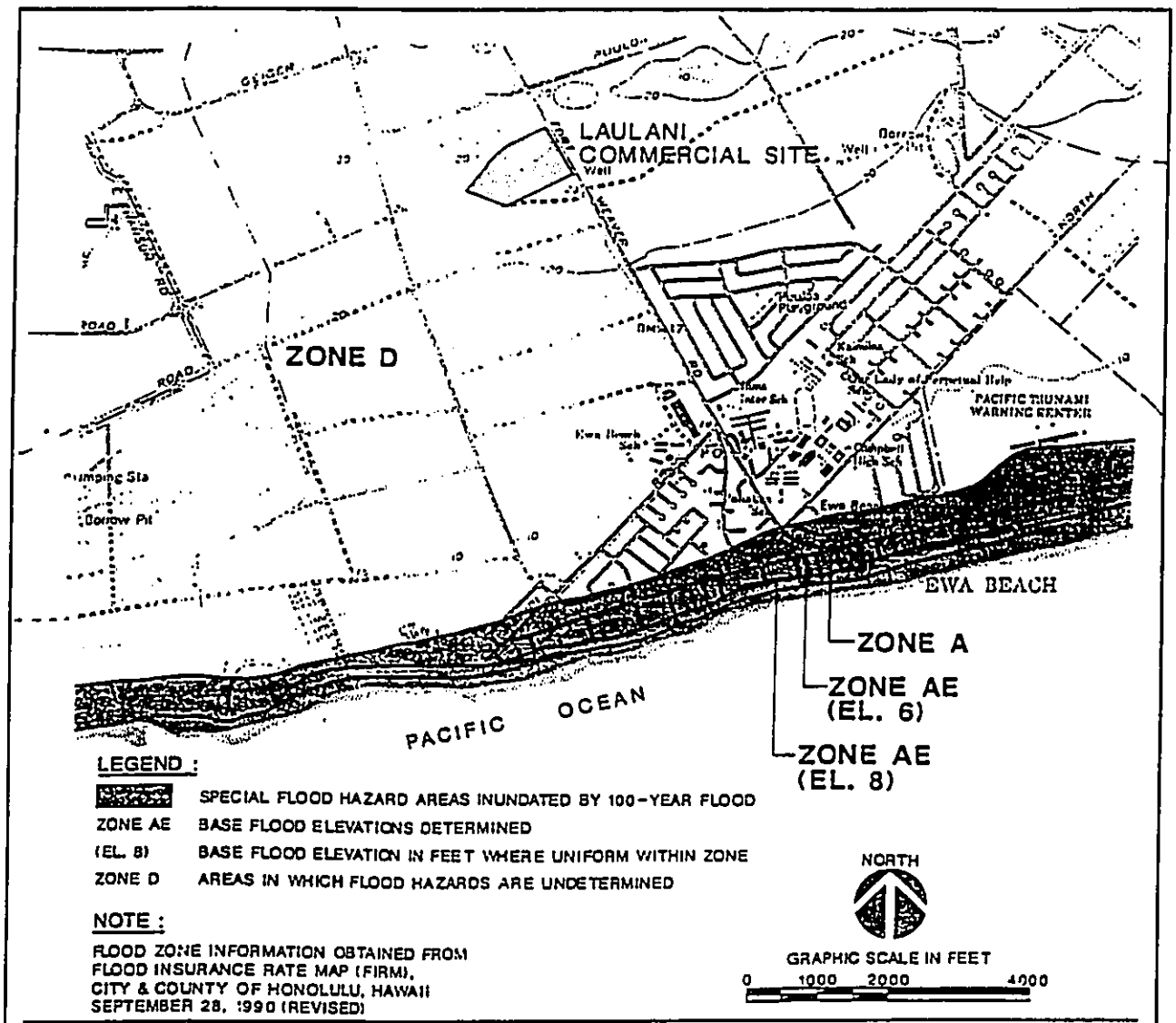

figure 8 **FLOOD MAP**
LAULANI COMMERCIAL
Ewa, Oahu, Hawaii

The project area is part of the Kaloi Gulch watershed area that extends from the crest of the Waianae mountain range to the shoreline, encompassing approximately 11 square miles (see *Figure 9*). Proposed development areas within the watershed include: Campbell Estate lands; the State property; the City and County of Honolulu Department of Housing and Community Development's (DHCD) Ewa Villages; the Laulani project; Ewa by Gentry; and Ewa Marina by Haseko.

Between the freeway and Mango Tree Road, Kaloi Gulch is generally a narrow, shallow, unlined ditch with limited capacity. Runoff from larger storms typically overtops the banks and spills into the adjacent cane fields. Additional restrictions are imposed at haul road crossings where culverts allow only minimal flows to pass through without overtopping the channel. From a short distance above Mango Tree Road to its makai terminus, the Kaloi Gulch channel is manmade and consists of two levees built above existing ground. The channel invert is at or above the adjacent ground. The capacity of the channel through this section is very limited and unable to accommodate large runoff under existing conditions.

Coordination of permanent and temporary improvements is continuing among the developers in the watershed. Temporary improvements will be required for the developments due to the varying stages of development for each project.

There are no existing drainage improvements within the project site. Runoff generated on the site and from the surrounding Laulani drainage basin (*Figure 9*) flows overland towards existing depressions or in a southerly direction. Runoff from the 20-acre project site was estimated for the 10-, 50, and 100-year storms under existing conditions by the Rational Method. One-hour rainfall intensities used in the analysis were 1.75 inches per hour for the 10-year storm, 2.3 inches per hour for the 50-year storm, and 2.5 inches per hour for the 100-year storm.

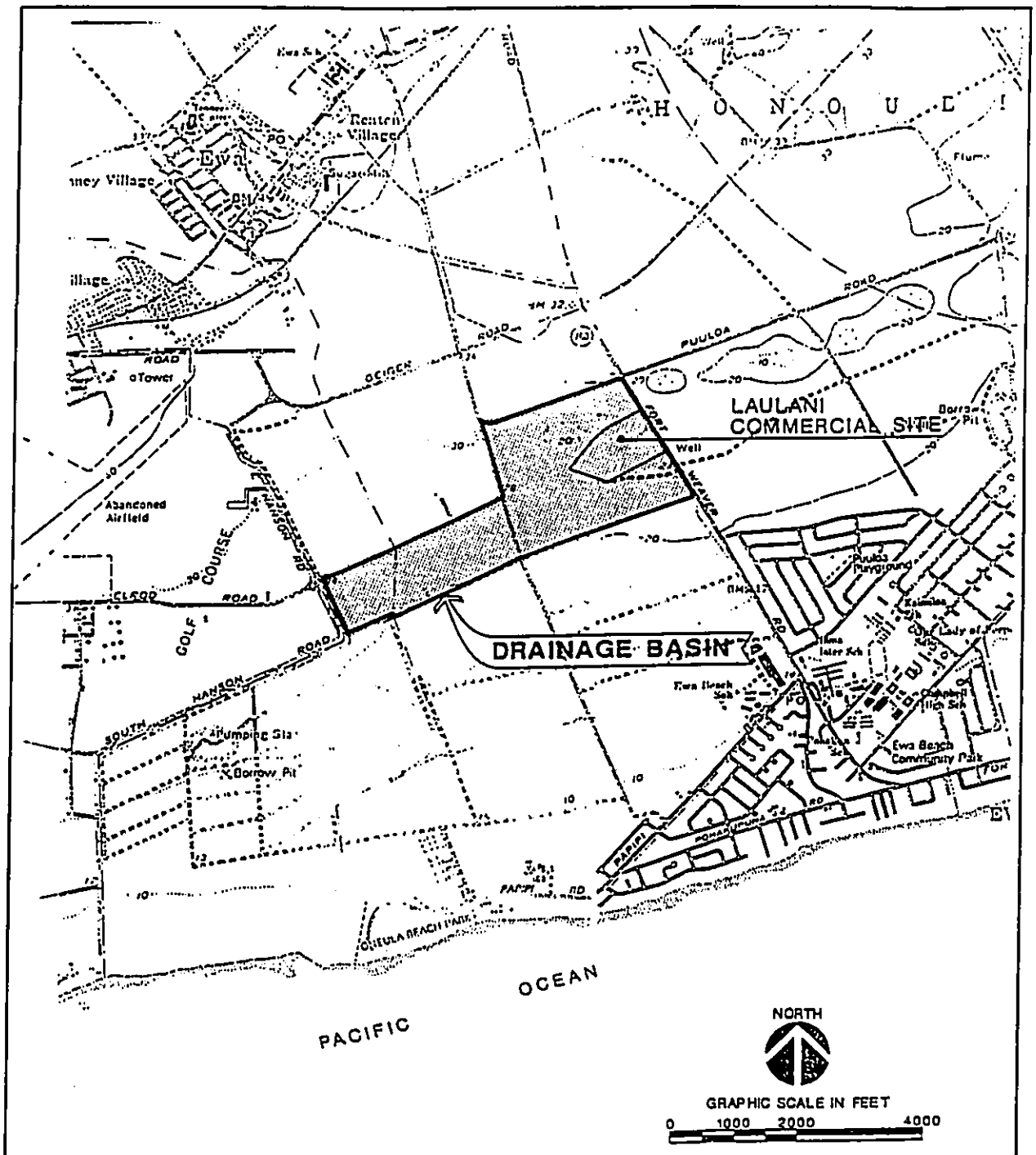

figure 9

DRAINAGE BASIN
LAULANI COMMERCIAL
Ewa, Oahu, Hawaii

RUNOFF BEFORE AND AFTER DEVELOPMENT

Project Site	Existing Conditions (cfs)	Developed Conditions (cfs)	Percent Increase
10-yr	18	80	344
50-yr	24	106	342
100-yr	26	115	342

Modifications After Development

Storm runoff from the proposed development will be collected by an onsite underground collection system ultimately discharging to a main drainage system serving the entire Laulani/Fairways development area. The commercial project's drainage system is planned to include catchbasins/inlets and drainpipes within the 20-acre property. Collected runoff would be conveyed to a public system along roadways adjacent to the site. The public drainage system will be typical of drainage systems serving residential developments, and will include catchbasins, manholes, and drainpipes within dedicated public roadways.

6.1.2. Impacts and Mitigative Measures

The proposed commercial development will alter the character of the project site. The sugar cane fields will be replaced by paved areas, buildings, and other commercial facilities. Consequently, the rate of runoff generated onsite and from the entire drainage basin will increase (see the preceding Table for a summary of the percent increase in runoff before and after development).

Runoff from the project site is intended to flow to a system of inlets, drain pipes and outlet structures. The ultimate disposal point for all runoff from the project will be the realigned and improved Kaloi Gulch. A portion of the overall Laulani commercial and Fairways residential development area being considered have been reserved for the implementation of a major drainageway through the area. This drainageway will be located on the western end of the parcel, and will connect the golf course drainageway of the mauka Gentry project to the Ewa Marina project located to the south. This entire drainageway will be designed to accommodate peak runoff from the contributing mauka drainage basin as well as the runoff from the Laulani commercial project. Runoff generated offsite, such as the Ewa by Gentry project, will enter the project site through this drainageway.

Ultimately, the Ewa Marina project will be designed to accept the peak runoff from mauka lands which includes the project. In the interim, detention basins are planned for areas not proposed for development in the near future to dampen any increase in runoff resulting from the project minimizing impacts. These basins will be kept in use until the makai drainage systems of the Ewa Marina development are in place and are able to accommodate additional runoff from the project site.

6.2 Water Facilities

6.2.1. Existing Conditions

The project site is currently undeveloped, with no onsite potable water facilities. Potable water for the adjacent developments is presently provided by the Board of Water Supply (BWS) system via 8-, 16-, and 36-inch mains in Fort Weaver Road. The water source is found near Waipahu in the vicinity of the Kunia Interchange. The Hoaeae Wells, Kunia Wells I and II, and the Waipahu Wells feed the water system serving the Ewa/Kapolei area. The Ewa Plains Water Development Corporation, of which the Estate is a member, has developed water system infrastructure to serve the needs of the developments in the area.

Modifications After Development

It is anticipated that the present potable water system serving the area will be used to serve the project site. If available, nonpotable water would be used for landscape irrigation. The potable water demand for the project site can be estimated by the acreage of the development and a water use factor. A factor of 3,000 gallons per acre per day (gpad) is used to calculate the water allocation for an all potable water system. If a dual water system is implemented, the potable demand factor would be 2,160 gpad, with a nonpotable demand factor of 1,440 gpad.

Based on the 20-acre project site, estimated water demands are 60,000 gallons per day (gpd) for an all potable system; and 43,200 gpd potable water and 28,800 gpd nonpotable water for a dual system.

The water system for the Laulani development is planned to be installed in the future roadway. It is anticipated that the Laulani system would connect to the existing 36-inch line in Fort Weaver Road. Water and fire protection service for the commercial development would tap into the line in the future road.

6.2.2. Impacts and Mitigation

Development of the project will increase the demand for both potable and nonpotable water in the area. As a member of the Ewa Plains Water Development Corporation, the Estate would have a pro rata share of necessary improvements.

The proposed potable water system in the future road will be designed in accordance with the BWS Water System Standards and is anticipated to be dedicated to the BWS for operation and maintenance. A water master plan for the Laulani development, including the project site, will be prepared and submitted to BWS for their review and approval.

Short-term impacts due to the proposed water system will be construction related and may include dust, noise and traffic disturbances along Fort Weaver Road. Mitigation of these potential short-term impacts can be achieved by limiting construction to off-peak traffic hours, use of wind breaks or watering to reduce dust, implementation of approved traffic control plans, and compliance with applicable Administrative Rules of the State Department of Health, Title 11: Chapter 42 (Vehicular Noise Control for Oahu), Chapter 43 (Community Noise Control for Oahu), and Chapter 60 (Air Pollution Control).

6.3. Wastewater Facilities

6.3.1. Existing Conditions

The project site is presently undeveloped, with no existing wastewater facilities onsite. The nearest municipal treatment facility, the Honouliuli Wastewater Treatment Plant (WWTP) is located one mile west of the project site. An existing 30-inch force main located within Fort Weaver Road conveys wastewater from the Ewa Beach area to an existing 84-inch gravity sewer in Geiger Road to the north. The 84-inch sewer line is the main line to the WWTP.

Modifications After Development

Wastewater generated from the project is expected to be of typical domestic composition. The average design flow is estimated to be about 60,000 gpd based on an equivalent population of about 40 capita per acre and a average wastewater generation rate of 80 gallons per capita per day.

The proposed wastewater system will include a collection of pipes and manholes conveying wastewater to the existing 84-inch line in Geiger Road. Based on the final elevations of the project and the surrounding Laulani development, a private lift station may be implemented onsite to pump the project's wastewater to the sewer main in Geiger Road.

6.3.2. Impacts and Mitigation

Wastewater impacts related to the proposed development are expected to be short-term in nature. Short-term impacts are related to the construction of the proposed sewer improvements. Construction impacts will be minimized by implementing an approved traffic control plan, limiting construction to off-peak traffic hours and coordination of construction with any other improvements planned for Farrington Highway. Noise and dust generation will be further minimized by compliance with applicable Administrative Rules of the State Department of Health, Title 22: Chapter 42 (Vehicular Noise Control for Oahu), Chapter 43 (Community Noise Control for Oahu), and Chapter 60 (Air Pollution Control).

Under existing conditions, the additional 0.06 MGD average wastewater flow from the project site should not have a significant affect on the capacity of the Honouliuli WWTP, especially since the capacity of the plant has been expanded. The application for sewer connection will still need to be filed with and reviewed by DWM. Wastewater requirements will continue to be coordinated with DWM. The wastewater collection system for the project will also be coordinated with the requirements for the overall Laulani development to facilitate future interconnection.

6.4. Solid Waste

6.4.1. Existing Conditions

The project site is presently undeveloped and does not generate solid wastes.

Modifications After Development

The project site will generate solid waste during construction and after development. Construction wastes will consist primarily of vegetation, rocks, and debris resulting from clearing the site prior to construction. Solid wastes generated by the commercial development is expected to be of typical commercial/domestic composition.

6.4.2. Impacts and Mitigation

The proposed development will generate solid waste from both construction activities and commercial operations. The generation of solid wastes due to clearing of the site and construction of facilities will be a short-term impact. The contractor will be required to remove all debris from the project site to mitigate the environmental impact.

After development, refuse from the proposed commercial area will be serviced by a private refuse collection company. Commercial activities are estimated to generate solid wastes in the range of 1,900 to 2,300 tons per year. This estimate is based on the amount of solid wastes currently generated by similar developments such as the Ewa Beach Shopping Center and Kapolei Shopping Center.

The City and County currently operates a landfill site in Waimanalo Gulch and the H-Power waste energy recovery facility on the leeward side of Oahu. Refuse from the project site is not expected to have a significant impact on the leeward Oahu solid waste disposal facilities.

The Estate of James Campbell does encourage and support recycling efforts to assist in the State's waste reduction goals. The Kapolei Shopping Center presently uses trash receptacles which separate recyclable materials. The Estate also supports the green waste operation in the James Campbell Industrial Park where landscaping and construction debris are recycled into compost. These current practices would continue to be part of the solid waste mitigation efforts of the developer along with investigating other appropriate waste minimization options.

6.5. Power and Communications

6.5.1. Existing Conditions

Hawaiian Electric Company (HECO) and GTE Hawaiian Telephone Company provide electrical and telephone service to the adjacent developments.

Modifications After Development

It is anticipated that existing electrical and telephone lines will be extended along the future roadway to the project site to provide service for the proposed commercial development.

6.5.2. Impacts and Mitigation

The proposed commercial development will place additional demands on the utility systems. It is estimated that electrical demands for this project will be approximately 15,400,000 kwh/year. Mitigation of potential impacts to the HECO system due to development in the Ewa/Kapolei area are under consideration in the planning of new facilities. Plans for future expansion of the Kahe Power Plant to increase power generation capabilities have been indicated by HECO.

6.6. Traffic

Vehicular access to the project will be provided via the addition of two new driveways along Fort Weaver Road and a fourth leg (project access road) to the existing T-intersection of Fort Weaver Road with the Prince Golf Course Access Road. At this time there are no plans to extend the project access road beyond the project site.

6.6.1. Existing Conditions

Roadway Conditions

Fort Weaver Road serves as the only thoroughfare in the area from Ewa Beach to West Loch Estates, providing vehicular access to the rest of Oahu.

Fort Weaver Road is a four-lane divided arterial highway from the Kunia Interchange to the Ewa Beach community. The posted speed limit varies from 25 to 45 miles per hour (mph) with a speed limit of 35 mph in the vicinity of the project. The major intersections along Fort Weaver Road are signalized. Fort Weaver Road can be classified as a suburban arterial since the spacing of signalized intersections is less than two miles.

Geiger Road to the north is a two-lane road providing access to the Ewa by Gentry development and the Barbers Point Naval Air Station. The posted speed limit is 25 mph. The intersection of Fort Weaver Road with Geiger Road is signalized.

The project intersection is located about halfway between Geiger Road to the north and Hanakahi Street to the south. Presently, there is an unsignalized T-intersection at the project site which provides access to the Prince Golf Course.

Traffic Conditions

State Department of Transportation 24-hour count data indicates that the peak traffic periods along Fort Weaver Road occur form 6:30 to 7:30 in the morning and 3:30 to 4:30 in the afternoon. Manual traffic counts were taken at the intersection of Fort Weaver Road and Geiger Road and also the intersection of the Hawaii Prince Golf Course Access Road and Fort Weaver Road. The counts were taken on Tuesday, November 30, 1993, from 5:00 to 8:00 a.m. and from 3:00 to 5:30 p.m. These counts were used as the baseline condition upon which future estimated traffic volumes were added.

The following observations were made during the field survey:

- A queue formed for vehicles making left turns Honolulu bound from Geiger Road from 6:45 to 7:00 a.m. and from 3:30 to 3:45 p.m. Several of these vehicles were not able to clear the intersection during the green phase of the cycle.
- Several vehicles were making U-turns (heading northbound after making the U-turn) at the intersection of the Prince Golf Course access road and Fort Weaver Road.

Ewa Region Highway Transportation Master Plan

Due to the major developments planned for the Ewa region, the State Department of Transportation has formed a Working Group comprised of State, City and County planning agencies, and major developers of the region (including the Estate of James Campbell). The purpose of the Master Plan is to forecast future traffic in the region, identify roadway improvements to accommodate forecasted traffic, and determine a distribution of fair share costs to implement the required improvements for the Ewa region.

The Master Plan has determined specific roadway improvements along the H-1 Freeway, Fort Weaver Road, and the Kunia Interchange. The proposed North-South Road is being considered as an improvement to accommodate traffic from developments along Fort Weaver Road. The provision of the North-South Road would provide an alternate route of travel to the H-1 Freeway and alleviate the ramp conditions at the Kunia Interchange.

6.6.2. Impacts

Analyses were conducted on the following intersections to determine the relative impact of the Laulani Commercial development on the local roadway system and to determine improvements to mitigate the impact of the project, if necessary:

- Fort Weaver Road with Geiger Road
  - Existing: Signalized T-intersection
  - 1998 Without Project: Signalized cross intersection
  - 1998 With Project: Signalized cross intersection
- Fort Weaver Road with Project Access Road/Prince Golf Course Road
  - Existing: Unsignalized T-intersection
  - 1998 Without Project: Unsignalized T-intersection
  - 1998 With Project: Unsignalized cross intersection

- Fort Weaver Road with Project Driveway/Service Driveway
  - 1998 With Project: right turn in and right turn out of driveway only
- Project Access Road with Project Driveways

The study intersections were analyzed using methods outlined in the *Highway Capacity Manual*[1]. Future traffic, which included traffic from other proposed area developments, was forecasted for the year 1998 without and with the Laulani Commercial development. The results of the analyses are shown in the following Tables and described on the following pages.

The Laulani Commercial project is not expected to significantly impact traffic flow along Fort Weaver Road when the project is completed in the year 1998. However, it will impact the existing intersection of Fort Weaver Road and the Prince Golf course Access Road where the main project access will be.

By the year 1998, even without the project, traffic flow conditions are expected to worsen due to the continuing development of the Ewa area. Fort Weaver Road as the only major roadway serving the east Ewa area is expected to be congested and over capacity. The intersection of Fort Weaver Road and Geiger Road is expected to operate over capacity and at LOS F.

[1] Highway Capacity Manual, Special Report 209, by the Transportation Research Board, National Research Council, 1985.

Unsignalized Intersection Analysis

Turning Movements	1993 Existing AM	1993 Existing PM	1998 Without Project AM	1998 Without Project PM	1998 With Project AM	1998 With Project PM
Intersection of Fort Weaver Road and Project Access Road/Prince Golf Course Access Road						
Fort Weaver Road						
Northbound LT	n/a	n/a	n/a	n/a	F	F
Southbound LT	C	B	E	D	F	D
Project Access Road						
Westbound LT	E	E	E	E	F	F
Westbound TH	n/a	n/a	n/a	n/a	F	F
Westbound RT	A	A	B	B	B	B
Eastbound LT	n/a	n/a	n/a	n/a	F	F
Eastbound TH	n/a	n/a	n/a	n/a	F	F
Eastbound RT	n/a	n/a	n/a	n/a	B	F
Intersection of Fort Weaver Road with Project Driveway and Service Driveway						
Project Driveway						
Eastbound RT	n/a	n/a	n/a	n/a	B	E
Service Driveway						
Eastbound RT	n/a	n/a	n/a	n/a	B	D
Intersection of Project Access Road with All Project Driveways						
Project Road						
Westbound LT	n/a	n/a	n/a	n/a	A	A
Project Driveways						
Northbound LT/RT	n/a	n/a	n/a	n/a	A	A

Notes:
AM - Morning Peak Hour
PM - Afternoon Peak Hour
LT - Left turn
RT - Right turn
TH - Through movement
n/a - Not applicable

Signalized Intersection Operational Analysis
Intersection of Fort Weaver Road with Geiger Road

Turning Movements	1993 Existing AM	1993 Existing PM	1998 Without Project AM	1998 Without Project PM	1998 With Project AM	1998 With Project PM
Fort Weaver Road and Geiger Road						
Northbound Approach	B	B	F	F	F	F
Southbound Approach	B	C	E	F	E	F
Westbound Approach	C	C	F	E	F	E
Eastbound Approach	C	C	D	F	D	F
Overall Intersection	B	C	F	F	F	F
Ave. Delay per Vehicle (sec)	14.71	18.54	64.05	195.81	75.35	201.69
Volume/Capacity	0.51	0.69	1.07	1.19	1.11	1.18

Notes:

AM - Morning Peak Hour
PM - Afternoon Peak Hour

Signalized Intersection Analysis

Turning Movements	1993 Existing AM	1993 Existing PM	1998 Without Project AM	1998 Without Project PM	1998 With Project AM	1998 With Project PM
Fort Weaver Road and Project Access Road/Prince Golf Course Road						
Northbound Approach	n/a	n/a	n/a	n/a	B	B
Southbound Approach	n/a	n/a	n/a	n/a	B	F
Westbound Approach	n/a	n/a	n/a	n/a	C	C
Eastbound Approach	n/a	n/a	n/a	n/a	C	E
Overall Intersection	n/a	n/a	n/a	n/a	B	F
Ave. Delay per Vehicle (sec)	n/a	n/a	n/a	n/a	14.71	260.31
Volume/Capacity	n/a	n/a	n/a	n/a	.073	1.27
Fort Weaver Road and Geiger Road						
Northbound Approach	B	B	F	F	F	F
Southbound Approach	B	C	E	F	E	F
Westbound Approach	C	C	F	F	F	F
Eastbound Approach	C	C	D	F	D	F
Overall Intersection	B	C	F	F	F	F
Ave. Delay per Vehicle (sec)	14.71	18.54	64.05	195.81	75.35	201.69
Volume/Capacity	0.51	0.69	1.07	1.19	1.11	1.18

Notes:

n/a - Not applicable
AM - Morning Peak Hour
PM - Afternoon Peak Hour

Signalized Intersection Analysis (With North-South Road)

Turning Movements	1998 With Project AM	PM
Fort Weaver Road and		
Project Access Road/Prince Golf Course Road		
Northbound Approach	B	B
Southbound Approach	B	C
Westbound Approach	C	D
Eastbound Approach	C	D
Overall Intersection	B	C
Ave. Delay per Vehicle (sec)	11.24	21.14
Volume/Capacity	0.56	0.89
Fort Weaver Road and Geiger Road		
Northbound Approach	C	B
Southbound Approach	C	C
Westbound Approach	D	D
Eastbound Approach	D	D
Overall Intersection	C	C
Ave. Delay per Vehicle (sec)	22.41	20.99
Volume/Capacity	0.86	0.85

Notes:

n/a - Not applicable
AM - Morning Peak Hour
PM - Afternoon Peak Hour

6.6.3. Mitigation

With the proposed North-South Road, identified in the Ewa Region Highway Transportation Master Plan, and additional turn lanes recommended in the Ewa Gentry Traffic Impact Study[2], the intersection of Fort Weaver Road and Geiger Road is expected to operate under capacity.

With the project in the 1998, the results of the analysis indicate that the intersection of Fort Weaver Road and Geiger Road will continue to operate under capacity (LOS D or better). At the unsignalized intersection of Fort Weaver Road and the Project Access Road, motorists exiting the minor streets onto Fort Weaver Road are expected to experience very long delays. To provide for smooth traffic operations, the following improvements at the intersection of Fort Weaver Road and the Project Access Road will be considered:

- Signalization when warranted
- A left turn storage lane northbound along Fort Weaver Road for vehicles making left turns into the Project Access Road.

With the above improvements, the roads serving the project will have sufficient capacity to accommodate the project traffic.

6.7 Police Protection

6.7.1. Existing Conditions

Ewa is in District III, which extends from Red Hill to Kaena Point and Kipapa Ridge and is handled by the Pearl City Police Station. Currently 18 beat officers operate in the Ewa Development Plan area daily.

[2] *Traffic Impact Study, Ewa Gentry*, Parsons Brinckerhoff, August 1988

Long-term plans include a new full-service station in Kapolei, with the establishment of Ewa and the Waianae coast as a new district. The Kapolei station would be the headquarters for five beats in Ewa and eight beats along the Waianae coast.

6.7.2. Impacts and Mitigation

The project will impact police protection services because it will increase concentrated human activity in the area. The increased demand could be met, however, if current plans for police protection services are implemented.

The project could help mitigate the impact on police protection services by providing on-site security measures and/or personnel who will monitor suspicious activities and handle minor problems.

6.8. Fire Protection

6.8.1. Existing Conditions

First alarm at the project site is handled by the Ewa Beach and Waipahu Fire Stations. The Makakilo Fire Station provides backup. Currently there are 15 fire fighters per shift at the Ewa Beach Fire Station.

To accommodate anticipated growth in Ewa, four new fire protection facilities are being planned. First, planning and design funds have been received for a new fire station at the James Campbell Industrial Park. This is envisioned as an engine-and-ladder company and will have a battalion chief. Second, the Ko Olina Phase 1 fire station would also be an engine-and-ladder company, with twelve fire fighters per shift. Third, there have been tentative plans for the relocation of the existing Ewa Beach Fire Station to the Gateway Park of Ewa Marina. Finally, another fire station is planned at Tenny Village, but no time frame has been determined.

6.8.2. Impacts and Mitigation

The project will increase the demand for fire protection services by increasing the number of structures and concentration of people in the area.

The increased demand for fire protection services can be adequately met if planned improvements and additions to fire protection services and facilities are implemented.

6.9. Schools

The project will not create the need for additional schools or classrooms. No mitigation is required.

6.10. Parks

The project will not create the need for parks or other recreational facilities. The commercial center will, however, be landscaped and planted with trees.

7.0. ENVIRONMENTAL IMPACTS

This chapter focuses on the physical characteristics and existing environment of the project site, identifies the probable project-related impacts to the physical environment and, where appropriate, presents mitigative measures to offset any adverse conditions.

7.1. Flora

Field surveys to assess the botanical resources on a 301.18 acre site, which included the project site, were conducted by Char and Associates in August 1991. A summary of the survey follows:

The primary objectives of the survey were to:

- Describe the major vegetation types,
- Inventory the flora, and
- Search for threatened and endangered species protected by Federal and/or State laws.

Prior to undertaking the field survey, a search was made of the pertinent literature. Existing topographic maps and aerial photographs were examined to determine access, terrain characteristics, vegetation cover patterns, boundaries, and reference points. Access onto the site was gained by unpaved canehaul road as well as by Fort Weaver Road. The walk-through survey focused on the less disturbed portions of the site, such as drainageways, roadsides, and other uncultivated areas. Native plants are more likely to occur in such situations.

7.1.1. Existing Conditions

The majority of the project site is currently under active sugar cane cultivation by Oahu Sugar Company, Ltd. The dense fields of sugar cane support few other species as cane tends to crowd out any weedy plants. There is not much change in topography on the site and the actively cultivated fields remain more or less uninterrupted except for old drainage ditches.

Sugarcane Fields

Few other species can compete with the fast-growing cane plants for available light, water, and nutrients. Within the fields, the few weedy species are usually found in the margins and include wild bittermelon (Momordica charantia), nutgrass (Cyperus rotundus), buffel grass

(Cenchrus ciliaris), fir-leaved celery (Ciclospermum leptophyllu), common sowthistle (Sonchus oleraceus), and pink bindweed (Ipomoea triloba). In certain places, yard-long bean plants (Vigna unguiculata ssp. sesquipedalis), sown by plantation workers, can be found.

Ruderal Vegetation

Along roadways and old irrigation ditches, is an assortment of weedy species, usually a mixture of various grasses, herbs, and small shrubs or subshrubs. A good example of this weedy or ruderal vegetation is found along Pu'uloa Road to the east of the site. Here large patches of wild bittermelon (Momordica charantia), 20 to 25 feet long and 10 to 12 feet wide, are found scattered among a weedy mixture of swollen finger grass (Chloris barbata), spiny amaranth (Amaranthus spinosus), golden crown-beard (Verbesina encelioides), false poinsettia (Euphorbiacyathophora), Guinea grass (Panicum maximum), virgate mimosa (Desmanthus virgatus), etc. Locally abundant are small patches of popolo (Solanum americanum). Infrequently found in these strips of ruderal vegetation are small trees of 'opiuma (Pithecellobium dulce) and kiawe (Prosopis pallida); a few shrubs of koa-haole also occur here.

In the area where the Kaloi drainage channel crosses to the west of the site, vegetation consists of dense Guinea grass with scattered clumps of koa-haole, three to 10 feet tall, and castorbean (Ricinus communis). California grass (Brachiaria mutica) may form a dense mat lining the bottom of this drainageway in places. Also common along the banks is coccinea or scarlet-fruited gourd, a vine with white flowers and red fruits about 2 to 2.5 inches long.

7.1.2. Impacts and Mitigation

The proposed project is not expected to have a significant negative impact on the botanical resources of the site, nor is it expected to have a significant cumulative impact on the flora of the general 'Ewa region. The vegetation on the site consists almost exclusively of actively cultivated fields of sugar cane. A ruderal or weedy association occupies uncultivated areas. The species found in these two vegetation types occur throughout the Hawaiian Islands

in similar habitats. Of a total of 59 species inventoried on and around the project site 55 (93%) are introduced or alien, one (2%) is originally a Polynesian introduction, and three (5%) are indigenous, that is they are native to the Hawaiian Islands but are found elsewhere. None of the species inventoried are officially listed threatened or endangered species, nor are any proposed or candidate for such status (U.S.Fish and Wildlife Service 1989, 1990).

Botanically, there is little of interest or concern on the site. There are no botanical reasons to impose any restrictions, conditions, or impediments to the development of the site. No mitigative measures concerning the botanical resources are recommended at this time.

7.2. Fauna

An Avifaunal and Feral Mammal Survey of a 301.18 acre site, which included the project site, was conducted by Phillip L. Bruner, Assistant Professor of Biology, BYU-H in July 1991. A summary of the survey follows. The objectives of the field survey were to:

- Document what bird and mammal species occur on the property or may likely occur given the range of habitats available;
- Provide some baseline data on the relative abundance of each species;
- Supplement these findings with published and/or unpublished data; and
- Identify any special or unique wildlife resources that may exist on the property and if necessary suggest ways in which these habitats may be protected.

7.2.1. Existing Conditions

No endemic land birds were recorded during the course of the field survey. The only likely endemic species which might occasionally forage in the area is the Hawaiian Owl or Pueo (Asio flammeus sandwichensis). Pueo are diurnal and can be found in upland forest as well as lowland grasslands and agricultural fields. This species is listed by the State of Hawaii as endangered on the Island of Oahu.

The only indigenous species recorded near the property was a single adult Black-crowned Night Heron (Nycticorax nycticorax). This bird was startled from an irrigation ditch to the west of the site.

Seabirds typically nest on offshore islands which are free from disturbance by dogs, cats, mongooses, and rats. However, there are areas on the main islands where predators lack access and nesting can be successful (Bruner 1988). No seabirds were found during the survey and it is unlikely any would nest at this site due to the presence of predators.

Two species of migratory shorebirds were recorded during the survey, Pacific Golden Plover (Pluvialis fulva) and Ruddy Turnstone (Arenaria interpres). Plover are probably the most common migratory species in Hawaii. They prefer open areas such as mud flats, fields, and lawns. Plover arrive in Hawaii in early August and depart to their arctic grounds during the last week of April. Johnson et al. (1988, 1989) and Bruner (1983) have shown plover are extremely site-faithful on their wintering grounds and many establish foraging territories which they vigorously defend. Such behavior makes it possible to acquire a fairly good estimate of the abundance of plover in any one area. Three plover were recorded during the survey. These birds were seen on cane haul roads and in a section of cleared land. Twenty turnstone were also seen foraging in the open fields. The plover and turnstone recorded during the survey likely represent "over-summering" birds--mostly juveniles--which did not migrate to the arctic in May. It is not unusual for some individuals to remain on the wintering grounds the first year (Johnson et al. 1989).

A total of 12 species of exotic birds were found during the survey. Table 1. of Appendix _ provides the species recorded and their relative abundance. The most abundant species were: Zebra Dove (Geopelia striata), nutmeg Mannikin (Lonchura punctulata), and common Waxbill (Estrilda astrild). Exotic species not recorded on the actual survey but which could potentially occur at this locality given the types of habitat available include : Japanese Bush-warbler (Cettia

diphone), Northern Mockingbird (Mimus polyglottos), Java Sparrow (Padda oryzivora), House Sparrow (Passer domesticus), House Finch (Carpodacus mexicanus), Eurasian Skylark (Alauda arvensis), Red Avadavet (Amandava amandava), and Barn Owl (Tyto alba) (Bruner 1989a, 1989b).

The only feral mammals observed during the survey were cats and the Small Indian Mongoose (Herpestes auropunctatus). Without a trapping program it is difficult to conclude much about the relative abundance of rats, mice, cats, and mongoose at the site, however, it is likely that their numbers are typical of those found elsewhere in similar habitat on Oahu.

7.2.2. Impacts and Mitigation

No special or unique wildlife habitat was discovered at this site. Cane fields, road brush, and weed choked irrigation ditches are common in the Ewa region. No endangered species were recorded. During the period of public comments on the Ewa Marina project (Bruner 1989) questions about the endemic and endangered Hawaiian Owl or Pueo were raised. Reports of their presence in the Ewa area, however were not confirmed. Upon late investigation, the owls that were being seen turned out to be the Common Barn Owl (Tyto alba). No mitigation required.

The relative abundance of exotic birds recorded during the field survey follows on the next page.

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE
Ring-necked Pheasant	*Phasianus colchicus*	R= 1
Cattle Egret	*Bubulcus ibis*	R= 14
Spotted Dove	*Streptopelia chinensis*	C= 9
Zebra Dove	*Geopelia striata*	A= 12
Common Myna	*Acridotheres tristis*	U= 4
Red-vented Bulbul	*Pycnonotus cafer*	C= 4
Red-crested Cardinal	*Paroaria coronata*	R= 8
Japanese White-eye	*Zosterops japonicus*	C= 6
Common Waxbill	*Estrilda astrild*	A= 20
Chestnut Mannikin	*Lonchura malacca*	C= 9
Nutmeg Mannikin	*Lonchura punctulata*	A= 14

KEY:

Relative abundance - Number of individuals observed during survey or frequency on eight minute counts in appropriate habitat.

A = abundant (10+) on 8 min. counts
C = common (5-10) on 8 min. counts
U = uncommon (less than 5) on 8 min. counts
R = recorded but not on 8 min. counts (number which follows is the total recorded over the course of the entire survey)

7.3. Noise

Field noise measurements and analyses were conducted by Darby & Associates (*Appendix C*) to assess the potential environmental noise aspects of the proposed commercial project. The Appendix contains various charts and tables supporting statements made throughout the study. See *Figure 10* on the following page for noise measurement locations.

7.3.1. Existing Conditions

Noise Sensitive Areas

The nearest existing noise sensitive area is the community of "Sun Terra" located approximately 800 feet north of the project site.

Traffic Noise

Noise from traffic along Fort Weaver Road affects residential units along the roadway to various degrees depending upon the setbacks provided, whether solid walls near the right-of-way exist or not, and whether homes are either one or two-story structures.

On December 1, 1993, traffic noise levels were measured at the entrance to the Hawaii Prince Golf Course (Position No. 1, *Figure 10*) and a Leq (10 minutes) of 57.8 dBA was obtained at a distance of 175 feet from the center of the roadway.

Ambient noise level measurements were also made in the nearest developed residential area to the project site, Sun Terra, at a location away from Fort Weaver Road (Position No. 2, *Figure 10*). The average noise level was 45 dBA during a 5-minute measurement period. This average level was dominated by muted traffic sounds from Fort Weaver Road.

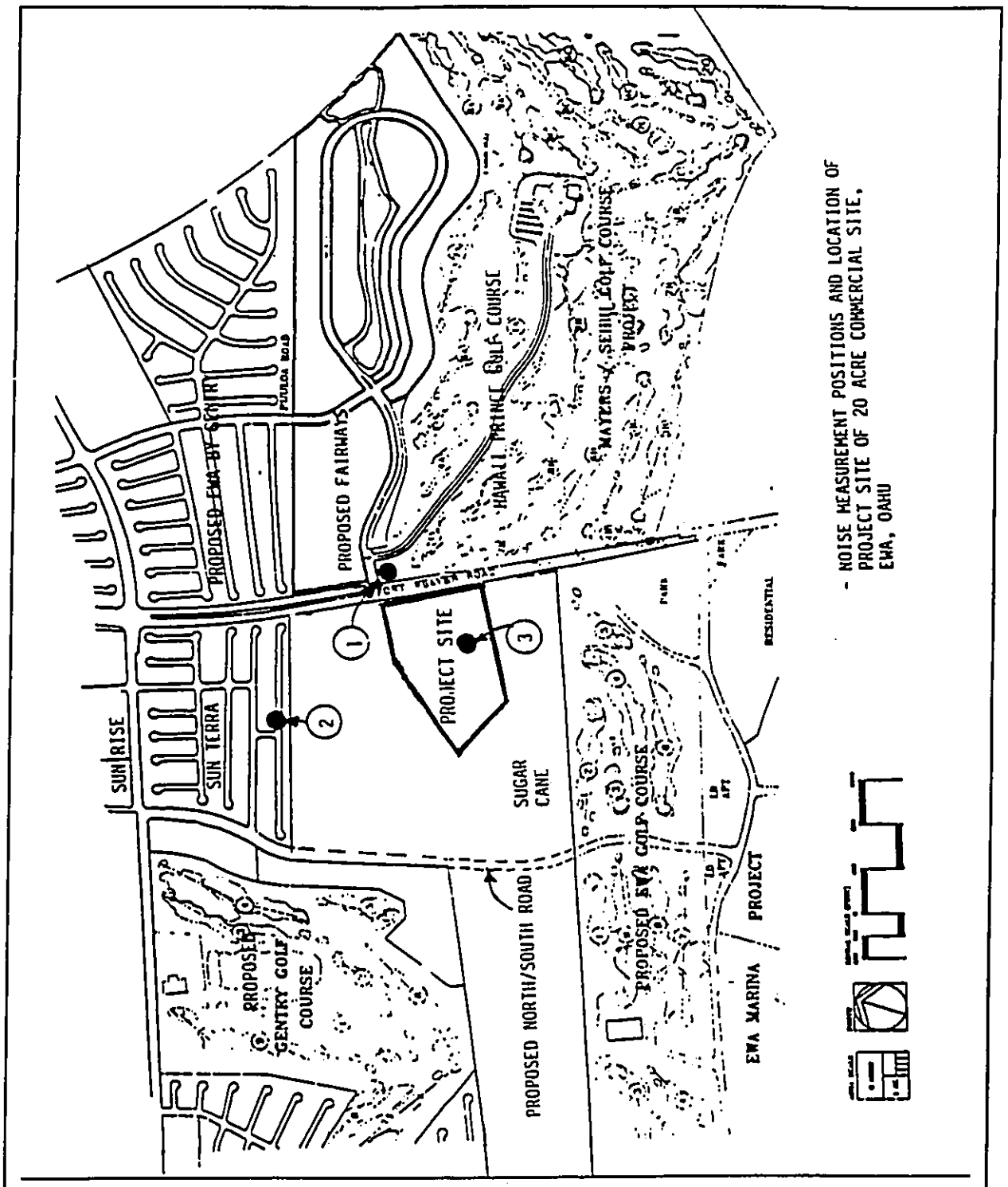

figure 10 **NOISE MEASUREMENT LOCATIONS**
LAULANI COMMERCIAL
Ewa, Oahu, Hawaii

Aircraft Noise

The project site is affected by noise from aircraft landing at Honolulu International Airport (HIA) on the Instrumented Landing System (ILS) for Runway 08L.

On December 1, 1993, a sample of ten aircraft overflight measurements were taken at Position No. 1 to verify previous noise level measurements (Letter Report, — *Ewa Subdivision Laulani/Fairways, Ewa, Oahu,* Darby & Associates, October 28, 1991). The estimated Ldn[3] at Position No. 3, based on the 1991 measurements, was Ldn 62 to 63. It should be noted that usually there are no aircraft movements on the ILS flight track to HIA from 7 p.m. to 7 a.m., unless emergencies or repair work occur at the airport.

7.3.2. Potential Impacts/Mitigative Measures - Existing or Future Noise Sensitive Location Due to the Project

Additional Traffic Generated by the Project

The calibrated FHWA traffic prediction model was used in conjunction with the traffic data provided by Pacific Planning and Engineering, Inc. to estimate the traffic noise level increases, if any, due to the project-generated traffic. The results, showed that the project-generated traffic will cause noise level increases along Fort Weaver Road of about 0.5 dB. In terms of subjective response to changes in the acoustical environment, a 0.5 dB increase is considered to be insignificant. Projected traffic volumes on the Proposed Road situated along the northern portion of the commercial site are not significant enough to cause potential noise problems.

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[3] Ldn - The Day Night Average Sound Level, Ldn, is a commonly used noise metric in assessing land-use compatibility and is used by federal and local agencies and standards organizations (U.S. Environmental Protection Agency, U.S. Administration, State Department of Transportation, American National Standards Institute, etc.).

The Ldn is an average on an energy basis, of 24 consecutive A-weighted hourly Leq sound levels, to which a 20 dBA penalty is applied for the nighttime and early morning hours (10 pm to 7 am) to account for people's higher sensitivity to noise during this period.

Traffic Noise Mitigation

Traffic noise mitigation is not required based on the projected noise levels. Structures built near Fort Weaver Road will act as noise barriers and cast acoustic shadows to areas west of the buildings. The probable enclosure and air conditioning of stores, banks, and restaurants will provide noise reductions for ground level facades of 20 to 25 dB. Earth berms along Fort Weaver Road could provide further noise reductions of 5 to 7 dB for ground level facades of structures.

Noise Impacts Generated by Activities Within the Project Site

Noise levels within the site varies depending on the type of stores or shops. Air conditioned businesses such as restaurants, supermarkets, etc. should only involve parking lot activity noise; whereas outdoor activities (e.g., auto repair and/or car wash facilities) could generate significantly higher levels of noise. Mechanical equipment (e.g., air conditioning units, pumps, fans, etc.) associated with commercial buildings could also be a source of annoyance to nearby residents, if not properly controlled.

Noise Generated Within the Project Site - Mitigation

The design and construction of commercial facilities will consider the use of standard noise mitigation devices (e.g., noise barrier walls, duct silencers, acoustic louvers, etc.) for air-conditioning equipment, pumps, fans, etc. in order to meet local DOH noise regulations (Chapter 43 - Community Noise Control for Oahu, DOH, State of Hawaii, Administrative Rules, Title 11, November 6, 1981).

Construction Noise

Development of the project site will involve grading and the construction of infrastructure and buildings. Any noise impact from these operations on residential areas should, however, be relatively short-term.

Construction Noise - Mitigation

Construction activities will comply with the provisions of Chapter 43-Community Noise Control for Oahu, and a permit will be obtained from the DOH in cases where construction noise are expected to exceed the DOH's "allowable" property line limits. Required permit considerations 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 be prohibited on Saturdays."

In addition, construction equipment and on-site vehicles or devices requiring an exhaust, gas, or air will be equipped with mufflers. Construction vehicles using roadways will comply with the DOH's vehicular noise requirements described under Chapter 42 - Vehicular Noise Control for Oahu.

7.3.3. Potential Impact/Mitigative Measures - Noise on the Subject Project

Aircraft Noise Impact on the Subject Property

The project site is currently exposed to aircraft generated noise levels ranging from about 58 to 63 Ldn. All portions of the project site are in compliance with both Federal and State DOT guidelines and criteria for commercial land use with respect to aircraft noise impact.

Aircraft Noise Mitigation

No mitigation is necessary for aircraft noise impact on the commercial site development

Traffic Noise Impact on the Subject Property

The noise impacted commercial areas in 1998 will be the structures closest to Fort Weaver Road. The noise levels at various setbacks from the roadway's centerline are:

- 200-foot setback from the center line of the highway 65 to 66 Ldn
- 400-food setback from the center line of the highway 62 to 63 Ldn
- 800-foot setback from the center line of the highway 59 to 60 Ldn

Traffic Noise Mitigation

The structures closest to Fort Weaver Road will serve as acoustic barriers to the commercial areas to the west.

Total Noise Impact on the Subject Property

If the worst case traffic noise exposure is added to the worst-case predicted aircraft noise on the commercial site, a range of 64 to 68 Ldn is obtained. These noise exposure levels are in compliance with all Federal criteria for commercial land use, but exceed the Ldn 65 level suggested by the State DOT Airports Division for aircraft noise alone.

Total Noise Impact - Mitigation

Noise mitigation is not required when combining the projected worst-case traffic and worst-case aircraft exposure based on all Federal guidelines and criteria. Actual total noise levels should be significantly less due to reductions in traffic noise afforded by the shielding and diffusion effects of buildings and parked vehicles.

7.4. Air Quality

An Air Quality study has been prepared by B.D. Neal & Associates (*Appendix D)*. The study examines the potential short- and long-term air quality impacts that could occur as a result of construction activities and use of proposed facilities. Mitigative measures to minimize project impacts are provided where appropriate.

7.4.1. Existing Conditions

Presently air quality in the project area is mostly affected by air pollutants from vehicular, industrial, natural, and/or agricultural sources. Fort Weaver Road, situated adjacent to the project site, is a major arterial roadway that often carries heavy volumes of traffic. Prevailing winds in the area tend to carry emissions from motor vehicles using this roadway toward the project site. Several industrial sources of air pollution are located a few miles to the west at Barbers Point, but the prevailing winds carry emissions away from the project site more than 80 percent of the time. Natural sources of air pollution that may affect the air quality of the site include ocean, plants, wind-blown dust, and distant volcanoes. Dust and smoke from nearby sugar cane operations also reduce the present air quality of the area.

The State Department of Health operates a network of air quality monitoring stations located at various places around Oahu and elsewhere within the state. Based on data from these stations, it appears likely that both state and national ambient air quality standards are currently being met in the project area except possibly for occasional exceedances of the more stringent state regulations pertaining to ambient carbon monoxide concentrations. Congested traffic conditions and possibly sugar cane operations in the project vicinity may cause occasional elevated levels of this air quality parameter.

7.4.2. Impacts

Short-Term Project-Related Impacts

Short-term impacts from fugitive dust will likely occur during the project's construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction.

Long-Term Project-Related Impacts

After construction, long-term impacts on air quality could potentially occur indirectly as a result of emissions emanating from vehicular traffic entering or exiting the development. Access to the project site will be accomplished primarily via a roadway that will intersect with Fort Weaver Road, and also by a driveway and service road that will connect with Fort Weaver Road. To assess the impact of emissions from these vehicles, an air quality modeling study was undertaken to estimate current maximum ambient concentrations of carbon monoxide along roadways leading to and from the project area, and to predict future levels of air pollution both with and without the proposed project.

Based on the modeling results, present worst-case carbon monoxide concentrations in the project vicinity were estimated to be well within the state and national ambient air quality standards. In the year 1998 without the project, concentrations would likely increase somewhat due to added traffic from other developments in the area. However, worst-case concentrations would remain within state and national standards. With the project in the year 1998 and assuming Fort Weaver Road remains four lanes wide, concentrations within the immediate project area would be substantially higher compared to conditions without it primarily due to the signalized intersection created by the project. Concentrations would remain within the national standards, however, if the proposed North-South roadway is built. Without the North-South roadway, traffic congestion along Fort Weaver Road may cause occasional exceedances of the national 8-hour standard for carbon monoxide. With or without the North-South roadway, worst-case carbon monoxide concentrations with the project may occasionally exceed the more stringent state standards near the project access road's intersection with Fort Weaver Road. Because state standards are set at more stringent levels, it is likely that they are currently exceeded at many locations within the state that have even moderate traffic volumes.

7.4.3. Mitigation for Short-Term Impacts

An effective dust control plan will be implemented during all phases of construction to ensure compliance with state regulations described under Hawaii Administrative Rules, Chapter 11-60. The plan will include appropriate measures such as the following:

- Watering of active work area;
- Using wind screens;
- Keeping adjacent paved roads clean;
- Covering open-bodied trucks;
- Limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked;
- Paving and landscaping the project area early in the construction phase;
- Moving construction equipment and workers to and from the project site during off-peak traffic hours.

Mitigation for Long-Term Impacts

In addition to roadway improvements discussed in the traffic study, the promotion of bus service, carpooling, energy conservation design features, conservation and recycling programs, and staggered business hours within the development will be encouraged to further reduce traffic congestion contributing to air quality impacts.

7.5. Views

7.5.1. Existing Conditions

The project site is flat and contains no predominant land features. Because of the flat terrain, the area has never been acclaimed for its scenic qualities. The views are centralized with no particular focus. Makai views are broad and panoramic with primary emphasis on the distant horizon.

7.5.2. Impacts and Mitigation

The broad, panoramic makai views and sense of open space as seen from certain portions of the freeway will not be adversely affected by the imposition of the project's commercial buildings. No ocean or scenic view planes within or through the project site will be adversely affected by the construction of the project structures. The development of the Ewa Gentry, Ewa Marina and Myers/Seibu golf courses surrounding the project site will insure the continuation, in part, of open space.

7.6. Archaeological/Historic

An archaeological surface reconnaissance survey, completed in June 1991 and updated in December 1993, has been conducted by the Anthropology Department, Bishop Museum (*Appendix A*). Examination of documents and literature relating to land use and occupation in the Puuloa area was conducted in conjunction with the surface survey of the parcel. The objectives of the investigation were to assess the potential for archaeological resources in the project area and to facilitate interpretation of any cultural remains encountered during the reconnaissance survey. The following tasks were undertaken:

1. Literature and Documents Search. A study of historical documents and literature regarding land use and occupation of the parcel was completed prior to field work.

2. Surface Reconnaissance. A walk-through survey of the parcel was conducted to determine the presence or absence of any surface cultural remains.

3. Report Preparation. A final report summarizing the results of the documents search and surface reconnaissance was prepared.

7.6.1. Existing Conditions

On the Ewa plain, along the coastline, many archaeological sites have been recorded in recent years, indicating that the area was settled by Hawaiians and was once rich with cultural activities. Archaeological evidence from these sites along the coast suggests that fishing and agriculture were the main subsistence activities occurring in this zone.

In contrast, the current project area, which is situated approximately 1 mi (1.5 km) from the coast, yielded no pre-Contact archaeological remains during this survey. Based on soil survey maps and expectations from previous archaeological research, the lack of pre-Contact archaeological sites nearby could be the result of the area being cleared and "filled" during the historical period, followed by the extensive agricultural disturbance over the last 30+ years. The lack of any subsurface archaeological remains observed during testing suggests this area of the intermediate zone (between the coast, the uplands, and Pearl Harbor) may never have been inhabited due to its proximity to more productive ecotones.

7.6.2. Impacts and Mitigation

The surface reconnaissance survey confirmed that this parcel has been used extensively over the past 100 years for the cultivation of sugar cane. One large depression, is still visible on the western boundary of the project area, covered by alluvium and planted in sugar cane.

The quarrying operation has wrought extensive landform changes to the portion of the project area that it occupies. Here, the alluvium has been stripped to expose the karst substrate, then bulldozed into large piles for processing.

No evidence of archaeological remains were observed in the whole project area. No further pre-construction archaeological procedures or monitoring procedures during construction are recommended. If construction-related excavation activities expose potential archaeological/paleontological objects and/or features, the Historical Preservation Division of the State

Department of Land and Natural Resources (DLNR) should be notified immediately.

7.7. Natural Features

7.7.1. Water Resources

The project site does not contain any water resources.

7.7.2. Flood Plain Management

The project site is designated Zone D in the Flood Insurance Rate Map, indicating areas in which flood hazards are undetermined. Zone D is not regulated by the Flood Hazard Districts of the Land Use Ordinance (LUO).

7.7.3. Wetlands Protection

The site does not contain any wetlands.

7.7.4. Coastal Zone Mangement

The site is not within the Special Management Area (SMA) and will not adversely impact any of the Coastal Zone Management (CZM) program objectives and policies.

7.7.5. Unique Natural Features

The area is generally flat, with the expection of a shallow depression on the western portion of the site. Discussions on slopes, erosion, soils, flora and fauna have been provided in preceding paragraphs above. The shopping center will be designed to comply with applicable density requirements.

7.8. Hazards

7.8.1. Nuisances and Site Safety

At this time, there are no known site safety or nuisances issues related to the project.

7.8.2. Thermal Explosive

Not applicable to this project.

7.8.3. Airport Clear Zone

Not applicable to this project.

8.0. ALTERNATIVES CONSIDERED

This Section considers alternatives to the proposed action currently under review. The 20 acres are designated and zoned for agriculture and presently cultivated in sugar cane. A No Action Alternative is presented as well as discussions on Alternative Sites, and Alternative Land Use Concepts.

8.1. No Action Alternative

Under the *No Action* alternative, Oahu Sugar Company, Ltd. would continue to cultivate sugar cane on the site until at least 1995, when land leases with The Estate of James Campbell expire. The company has announced its intention to terminate sugar operation at lease expiration. Nevertheless, land use proposals for residential and golf course developments are currently in process for much of the lands surrounding the project area. The site has also been identified for commercial uses on the Estate's master plan. As urbanization continues to occur consequent to the development of the secondary urban center, agricultural activities would probably be eliminated, and higher intensity development eventually proposed.

8.2. Alternate Sites

Site selection of the proposed project considered distance to planned and existing urbanized areas, existence of infrastructure to serve the project, and development of community services to support the emerging secondary urban center. Alternate sites in the area would be constrained by land use proposals in progress, distance from existing infrastructure, and the regulations and limitations imposed on lands under the jurisdiction of the Federal government.

8.3. Alternate Concepts

Various concepts, site plan configurations, and uses were considered in developing the plan under review.

Higher density development was considered inconsistent with existing public policies and regulations designed to preserve views and establish compatibility between adjacent uses. Lower intensity development would not have fulfilled the primary goal of providing the greatest number of commercial services to the area.

Various design configurations were developed and evaluated, with consideration given to traffic flow, ingress and egress, existing drainage patterns, and surrounding land uses.

9.0 PROPOSED MITIGATIVE MEASURES

Mitigative measures, where appropriate, have been included in sections throughout this document and in the Appendices attached.

10.0. PRELIMINARY DETERMINATION

Based on the studies conducted and the mitigative measures proposed in this document, the project is not expected to cause significant impacts to the environment. Following are reasons supporting a determination for a Negative Declaration.

1. The proposed project will not conflict with any State or City and County policies and guidelines.

2. The proposed project will not curtail the range of beneficial uses of the environment. The project will enhance the environment by improving the physical appearance of the site.

3. The proposed project will not adversely affect the economic or social welfare of the community or State. The project will increase employment opportunities.

4. The proposed project does not affect public health.

5. The proposed project will not involve substantial secondary impacts, such as population changes or effects on public services and facilities.

6. The proposed project will not have any impact on rare, threatened or endangered species of flora or fauna or habitat.

7. The proposed project will not have any impact on archaeological resources.

8. With mitigation, the proposed project will not detrimentally affect air or water quality or ambient noise levels.

9. The proposed project is consistent with the General Plan.

10. The project will comply with all applicable State and City and County regulations and ordinances.

11.0. LIST OF AGENCIES/COMMUNITY GROUPS CONTACTED

Below is a list of government agencies, community groups, and public utility companies receiving letters and a copy of the proposed amendment area in compliance with the requirements of Hawaii Administrative Rules §11-200-9 (early consultation) and Ordinance 84-111 (notification requirements).

1. The Honorable John DeSoto
   District Councilman
   Honolulu Hale
   Honolulu, Hawaii 96813

2. The Honorable Brian Kanno
   Hawaii State Senator, District 20
   State Office Tower
   Room 403
   235 South Beretania Street
   Honolulu, Hawaii 96813

3. The Honorable Annelle C. Amaral
   Hawaii State Representative, District 42
   State Office Tower
   Room 806
   235 South Beretania Street
   Honolulu, Hawaii 96813

4. The Honorable Paul T. Oshiro
   Hawaii State Representative, District 41
   State Office Tower
   Room 1007
   235 South Beretania Street
   Honolulu, Hawaii 96813

5. Mr. John Bickel, Chair
   Ewa Neighborhood Board No. 23
   91-6312 Kuilioloa Place No. 03
   Ewa Beach, Hawaii 96707

6. Mr. Glenn Oamilda, President
   Ewa Beach Community Association
   91-819 Pe'eone Place #B
   Ewa Beach, Hawaii 96706

7. Oahu Sugar Company
   P.O. Box 0
   Waipahu, Hawaii 96797

8. Gentry Development Company
P.O. Box 295
Honolulu, Hawaii 96809

9. Haseko (Hawaii) Inc.
820 Mililani Street
Suite 820
Honolulu, Hawaii 96813

10. The Myers Corporation
745 Fort Street Mall
Suite 1500
Honolulu, Hawaii 96813

11. Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96849-0001

12. Hawaiian Telephone Company
1177 Bishop Street
Honolulu, Hawaii 96813

13. The Gas Company
733 Bishop Street
Honolulu, Hawaii 96813

14. American Lung Association of Hawaii
245 North Kukui Street
Honolulu, Hawaii 96817

15. West Oahu Employment Corporation
92-605 Makakilo Drive
Ewa Beach, Hawaii 96707

16. Department of the Navy
Mr. W.K. Liu
Assistant Base Civil Engineer
Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860-5020

17. U.S. Department of Transportation
Mr. Henry A. Sumida
Airports District Office Manager
Federal Aviation Administration
Box 50244
Honolulu, Hawaii 96850-0001

18. Mr. Warren Lee
State Conservationist
United States Department of Agriculture
P.O. Box 50004
Honolulu, Hawaii 96850

19. Dr. John C. Lewin
Department of Health
1250 Punchbowl Street
Honolulu, Hawaii 96813

20. Mr. Keith Ahue
Chairperson
Board of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

21. Mr. Yukio Kitagawa
Director
Department of Agriculture
1424 South King Street
Honolulu, Hawaii 96814-1512

22. Ms. Esther Ueda
Executive Officer
State Land Use Commission
335 Merchant Street
Room 104
Honolulu, Hawaii 96813

23. Mr. Brian Y.Y. Choy
Director
Office of Environmental Quality Control
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

24. Mr. Harold S. Masumoto
Director
Office of State Planning
250 South Hotel Street, Fourth Floor
Honolulu, Hawaii 96811-3540

25. Mr. Rex Johnson
Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

26. Dr. John Harrison
Environmental Coordinator
Environmental Center
University of Hawaii
Crawford 317, 2550 Campus Road
Honolulu, Hawaii 96822

27. Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
630 S. Beretania
Honolulu, Hawaii 96813

28. Mr. Robin Foster
Chief Planning Officer
Planning Department
650 South King Street, 8th Floor
Honolulu, Hawaii 96813

29. Mr. Walter Ozawa
Director
Department of Parks and Recreation
650 South King Street, 10th Floor
Honolulu, Hawaii 96813

30. Mr. Joseph M. Magaldi, Jr.
Director
Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

31. Mr. Donald S.M. Chang
Fire Chief
Honolulu Fire Department
1455 South Beretania Street
3rd Floor
Honolulu, Hawaii 96814

32. Mr. Michael Nakamura
Police Chief
Honolulu Police Department
801 South Beretania Street
Honolulu, Hawaii 96814

33. Mr. Donald A. Clegg
Director
Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

34. Mr. Kenneth M. Rappolt
Director
Department of Wastewater Management
650 South King Street
Honolulu, Hawaii 96813

35. Mr. C. Michael Street
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

36. Mr. Victor D. Guillermo, Jr.
Director
Department of Human Resources
715 South King Street, 2nd Floor
Honolulu, Hawaii 96813

12.0. NOTIFICATION REQUIREMENTS

Ordinance 84-111 states:

> "No application for Development Plan Land Use Map Amendment shall be accepted for processing unless the applicant notifies, by mail, all owners, lessees, sub-lessees and residents of the affected property and of each abutting parcel."

I hereby certify that I have complied with the notification requirements of Ordinance 84-111.

WILLIAM E. WANKET
Agent for
The Estate of James Campbell

APPENDIX A

Archaeological Reconnaissance Report
Bishop Museum, Anthropology Department

MS 121593

AN ARCHAEOLOGICAL RECONNAISSANCE OF A PROPOSED 20-ACRE COMMERCIAL PROJECT, HONOULIULI, 'EWA, O'AHU ISLAND (TMK 9-1-69: por. 5)

by

Wendy L. Goodman, B.A.
Hemantha Jayatilaka, B.A.
Tomasi Patolo, B.A.
Barry Nakamura, B.A.
Richard Nees, B.A.
Boyd Dixon, Ph.D.

December 1993

Prepared for

William E. Wanket, Inc.
Land Use Consultants
Pacific Tower, Suite 660
1001 Bishop Street
Honolulu, HI 96813

Anthropology Department
Bishop Museum
Honolulu, Hawai'i

ABSTRACT

A walk-through surface reconnaissance survey and a search of historical documents and literature was undertaken for a 20-acre parcel in the *'ili* of Pu'uloa, in the *ahupua'a* of Honouliuli, slated for commercial development by the Campbell Estate. An examination of the historic documents and literature provided information pertaining to land use and ownership in the pre-Contact and historic periods. Various legends relate stories about fishponds located on the shores of Pearl Harbor, ghosts that wandered the 'Ewa Plain, and the introduction of breadfruit to the islands. Historic documents indicate that the entire *ahupua'a* was owned by M. Kekauonohi, the granddaughter of King Kamehameha I. Upon her death, portions of the land, including the project area. were sold to James Campbell, who grew sisal, sugar cane, and grazed cattle. Surface reconnaissance of the parcel confirmed the continued use of this area for cultivation of sugar cane. No cultural material or surface features were observed.

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INTRODUCTION

The Anthropology Department, Bishop Museum, under contract to William E. Wanket, Inc., conducted an archaeological surface reconnaissance survey of an approximately 20-acre land parcel slated for commercial construction by Campbell Estates.

Examination of documents and literature relating to land use and occupation in the Pu'uloa area was conducted in conjunction with the surface survey of the parcel. Work on this project commenced on June 3, 1991, and was completed on June 7, 1991, by Wendy Goodman and William F. Fortini. The following report presents findings of this reconnaissance survey, a historical literature search by Barry Nakamura, and a review of the environment and previous archaeology by Hemantha Jayatilaka, Tomasi Patolo, and Richard Nees.

PROJECT AREA DESCRIPTION

The project area is an approximately 20-acre land parcel located in the *ahupua'a* (traditional Hawaiian land division) of Honouliuli in the District of 'Ewa [TMK 9-1-69: por. 5].

The parcel lies between the communities of Waipahu and 'Ewa Beach, approximately three kilometers south of Waipahu and approximately one kilometer north of 'Ewa Beach (Figure 1). Honouliuli Valley lies approximately one kilometer northeast of the project area and Pearl Harbor is located approximately two kilometers to the east.

The project area is bounded on the north, south, and east by a proposed road and service driveway, and on the east by Fort Weaver Road.

The topography in the project area is flat, although one slight depression is located near the north western boundary, outside of the project area (Figure 2). Two larger topographic depressions are situated outside the project area on the east side of Fort Weaver Road.

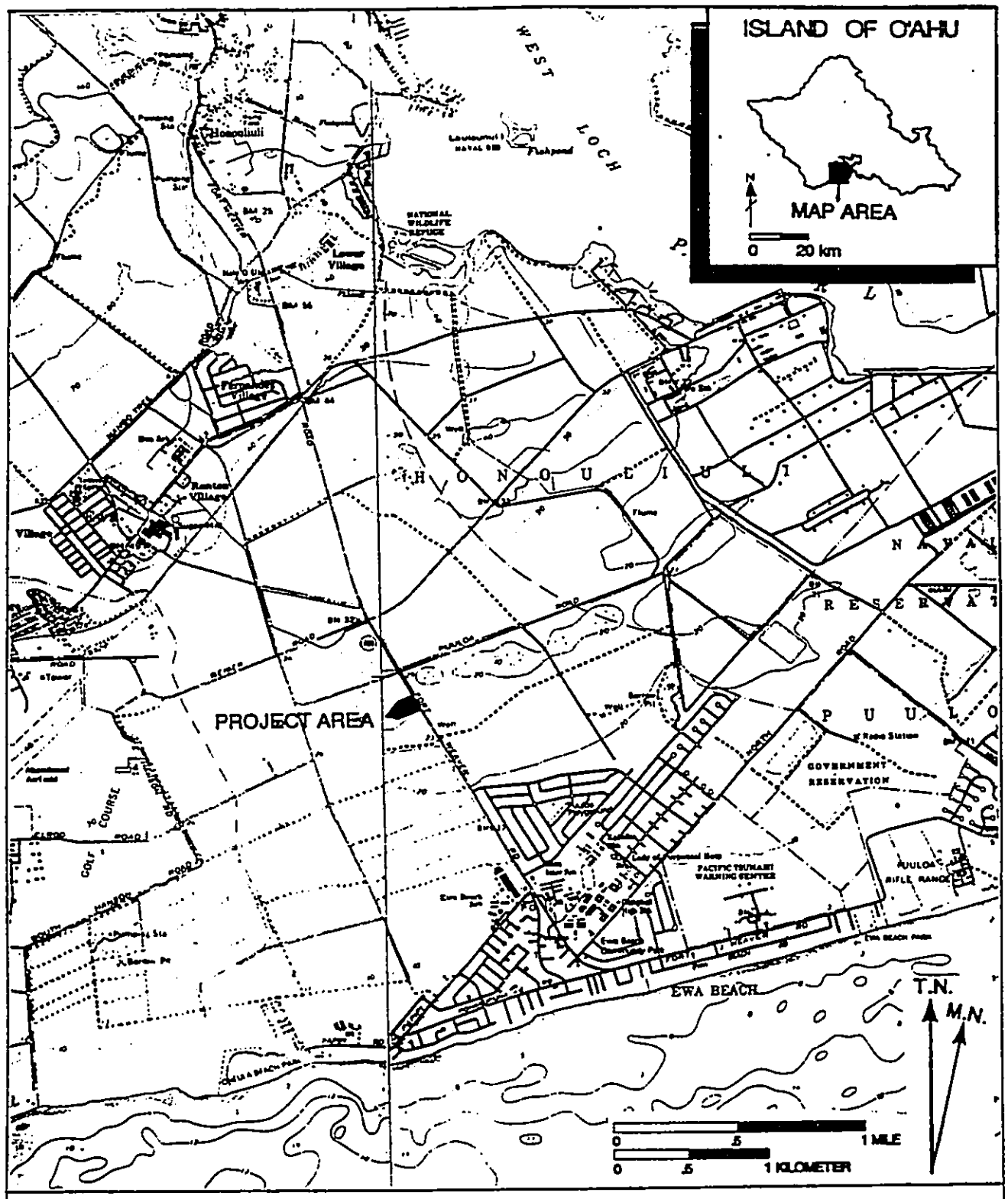

Figure 1. Project Area Location, USGS 1983.

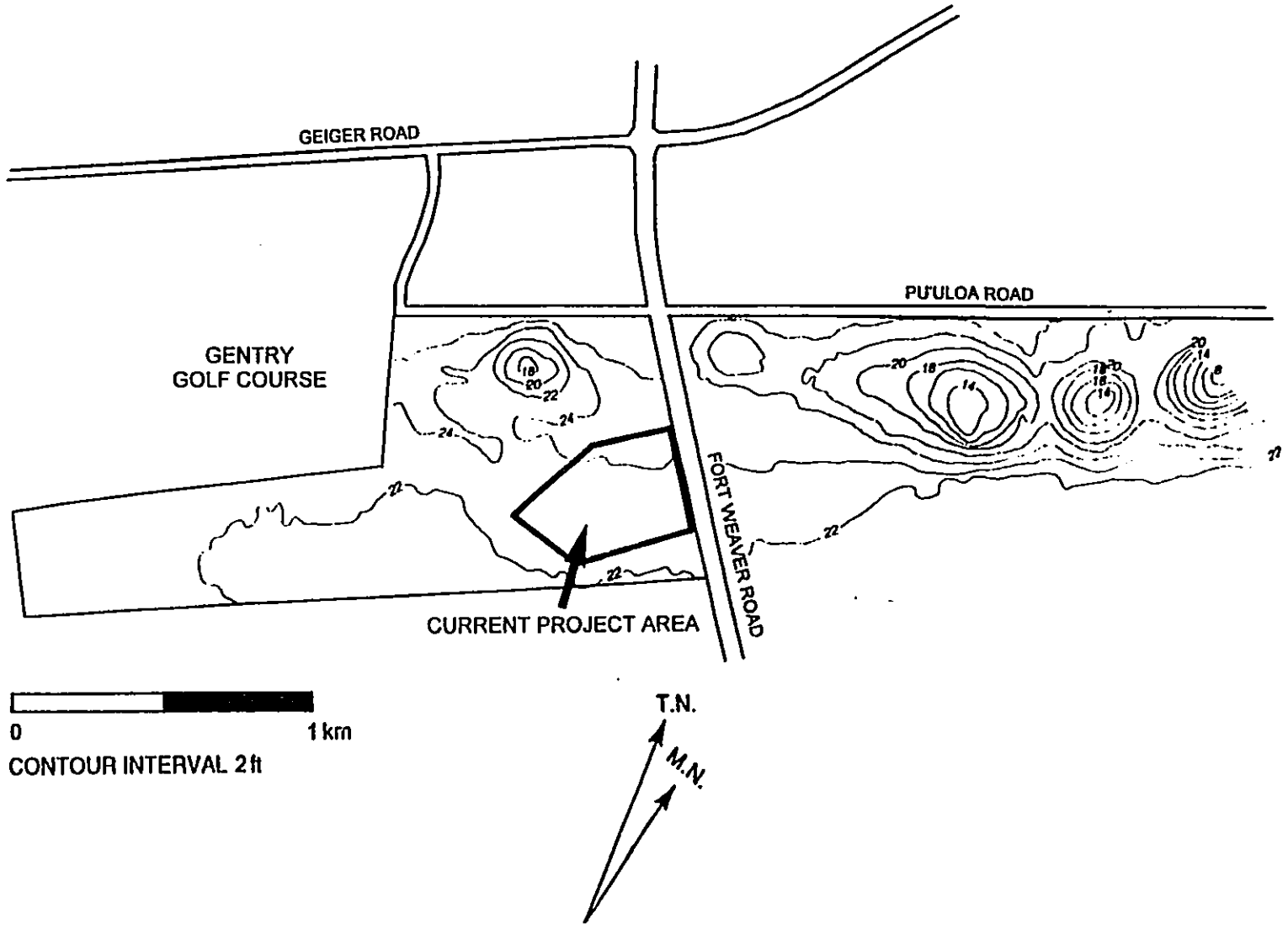

Figure 2. Property Boundary with Topographic Details.

Environment

The project area, according to topographic maps, averages 20 ft (6.1 m) above mean sea level. The median temperature is 74 degrees Fahrenheit. Annual rainfall ranges from 15 to 30 in. (3.9 to 11.8 cm). One major soil association is found within the project area: Lualualei-Fill land-Ewa association. This soil consists of "deep, nearly level to moderately sloping, well-drained soils that have a fine textured subsoil or underlying material, and areas of fill land; on coastal plains" (Foote et al. 1972). According to soil survey maps, the entire project area is made up of "fill" land. Fill land refers to "areas filled with material from dredging, excavation from adjacent uplands, garbage, and slurry from sugar mills" (ibid.). Areas containing the Lualualei-Fill land-Ewa soil association are primarily used for grazing, various crops, and urban development.

The vegetation in the project area consists primarily of introduced grasses and bushes, with only one native plant, *'ilima*, observed. In the southern portion of the parcel, feral cane (*Saccarum officinarum*) and alfalfa (*Medicago sativa* L.) are present. Table 1 lists the plants observed in the project area by common name along with their family, genus, and species. A column for Hawaiian names, when available, is also provided. Wagner et al. (1990) was used for plant identification and Hawaiian names.

PREVIOUS ARCHAEOLOGICAL WORK

There have been numerous archaeological investigations conducted in the *ahupua'a* of Honouliuli. Many of these investigations were conducted along the coast from 'Ewa beach to Barber's Point (Table 2). A literature search, however, revealed that no previous archaeological investigations have been conducted in the project area. Furthermore, no archaeological sites have ever been recorded in the project area.

Sterling and Summers (1978:36 and 41) mention only two archaeological sites located in the vicinity of the project area: McAllister's Sites 145 and 146.

Table 1
Plants Located within the Project Area

Family Name	Genus or Species	Common Name	Hawaiian Name	Status
Poaceae	*Chloris barbata* (L.)	swollen fingergrass	*mau'u lei*	Intro.*
	Saccharum officinarum	L. sugar cane	*kō*	Intro.
	Paspalum dilatatum	dallis grass	---	Intro.
Euphoribiaceae	*Ricinus communis* L.	castor bean	*pa'alia*	Intro.
	Euphorbia heterophylla	---	*kaliko*	Intro.
Fabaceae	*Crotalaria pallida* Aiton	smooth rattlepod	*pikakani*	Intro.
Poaceae	*Pennisetum setaceum*	fountain grass	---	Intro.

Table 2
List of Previous Archaeological Work

Location	Type of Work	Year	Reference
Honouliuli	Survey	1933	McAllister
'Ewa Beach	Survey	1972	McCoy
West Beach	Survey	1975	Barrera
Barber's Point	Survey	1976	Sinoto
Honouliuli	Survey	1978	Sterling and Summers
'Ewa Beach	Survey	1979	Jourdane
'Ewa Beach	Survey	1979	Davis
'Ewa Plain	Survey	1986	Davis, Haun and Rosendahl
'Ewa Beach	Testing	1983	Hommon and Ahlo
Iroquois Point	Burials	1987	Athens
Barber's Point	Survey	1987	Davis
'Ewa Plain	Survey	1988	Kennedy
'Ewa Plain	Testing	1988	Davis
'Ewa Plain	Survey	+	Davis+
'Ewa Plain	Survey	1991	Goodman
'Ewa Plain	Testing	1992	Jayatilaka et al.

+in preparation

Site 145 is the site of the first breadfruit tree planted in Hawaii. Sterling and Summers (1978) state that "Tradition credits the introduction of the breadfruit tree in these islands to Kahai, a son of Moikeha, who brought a species from Upolu in the Samoan group on his return voyage from Kahiki, and planted same at Puuloa, Oahu" (ibid., 41). There were no indications that surface structural remains were associated with this site when originally recorded.

Site 146 is described in Sterling and Summers (1978) as "'Ewa coral plains, throughout which are remains of many sites" (ibid.). There are no detailed descriptions of these "sites," but McAllister (1933) *mentions* that "holes and pits in the coral were formerly used by the Hawaiians" and that "the soil on the floor of the larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them" (ibid., 36).

Four relatively large parcels (Figure 3) surrounding the project area were previously surveyed and/or tested (Jourdane 1979; Hommon and Ahlo, Jr. 1983; Welch 1987; and Davis 1979 and 1988), yielding a total of 121 sites, 115 of which were found along the coast. These sites included enclosures, walls, sinkholes, a pavement, an *ahu*, mounds, a trail, garden areas, platforms, and C-shaped shelters.

Davis (1988) suggests, in his report on the proposed 'Ewa Gentry project area, that the lack of human habitation sites inland may be the result of this portion of the 'Ewa plain having been an "exposed windswept grassland subject to possibly the driest conditions in the region. As such, this would not have been a particularly suitable locale for anything but the shortest of short-term occupations" (ibid.). Davis (1979), in his report on the proposed 'Ewa-Marina community development, discusses settlement patterns of coastal and inland sites within his project area (Figure 3). All but two of the platforms were found near the beach and, with two exceptions, all of the enclosures and C-shapes were located inland. He concludes that "the number of cultural features, the size of individual habitation structures, and the extent of the sited areas now indicate that the whole of the coastal portion of the Ewa plain once supported a large and possibly permanent resident prehistoric

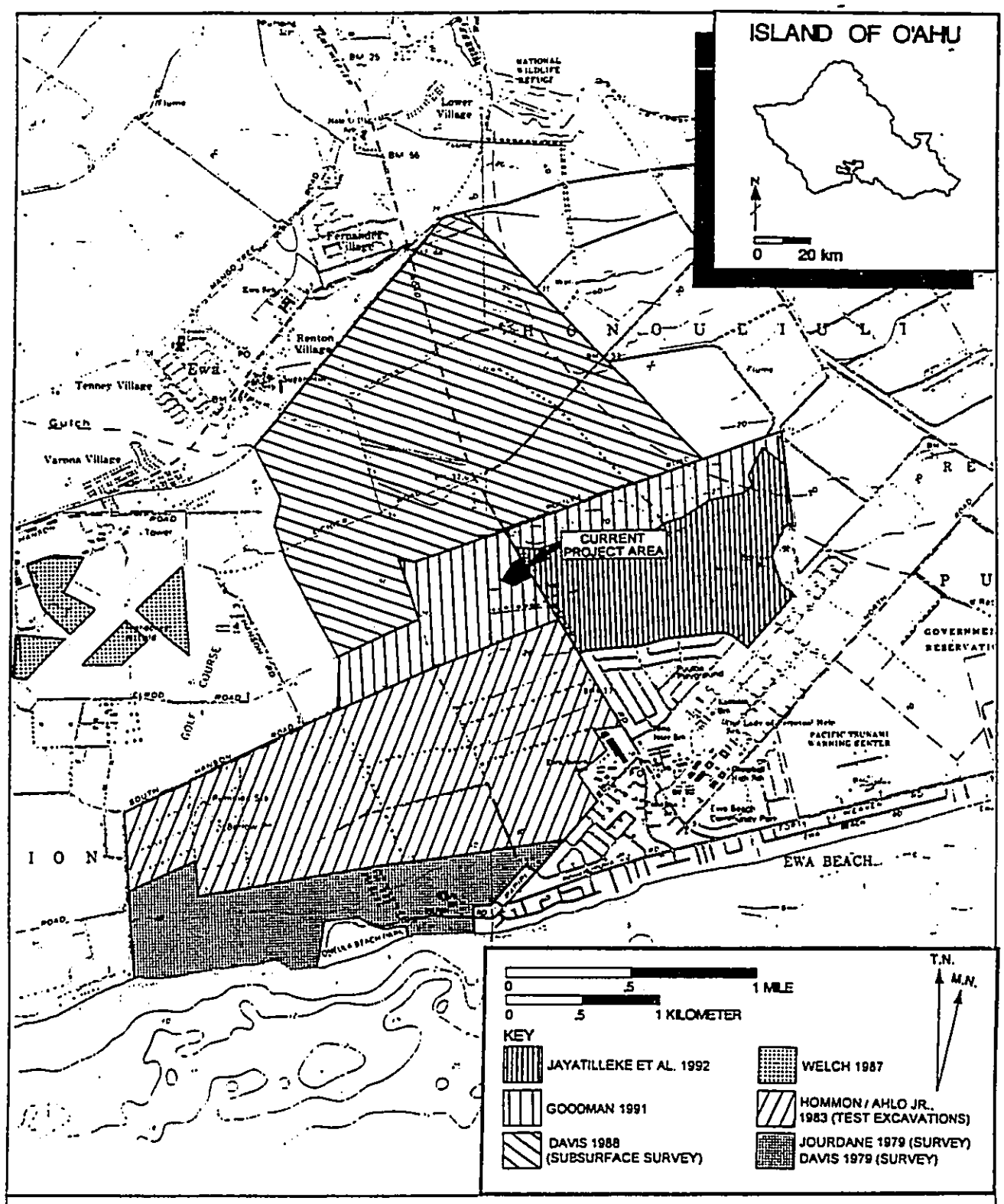

Figure 3. Previous Archaeology in the Vicinity.

population" (Davis 1979). Coastal or lowland settlement occurred as early as A.D. 100-600 (Davis and Haun 1987), with upland settlement occurring later. For more detailed information, the reader is referred to the above mentioned reports.

Hommon and Ahlo (1983) tested a parcel immediately north of where Davis recorded 107 sites and found no archaeological sites or subsurface cultural material (Figure 3). They state that the project area is "classed as filled land" and that "during the 1950s and 1960s, bagasse and sediment derived from the processing operations of Ewa Sugar Company (now Oahu Sugar Company) were deposited in the area" (ibid.), rendering the area void of any archaeological cultural material. Welch (1987) also recorded the "fill" in areas he labeled Sections C and D as did Jayatilaka et al. to the south (1992). A surface reconnaissance of the immediate surroundings of the project area (Goodman 1991) also revealed no archaeological material.

PRE-CONTACT SETTLEMENT MODEL

Given the paucity of historic documentation and the complete lack of previous archaeological research in the project area, an explicit model for pre-Contact settlement on this portion of the 'Ewa Plain is largely speculative. Agricultural destruction of the entire area beginning during the sugar cane boom in the late 1800s followed by subsequent filling in the 1950s and 60s has largely erased any evidence of Native Hawaiian settlement, making the testing of this model an excersize in futility.

Expectations for the project area, based on a synthesis of the previous archaeology in the surrounding *ahupua'a*, are presented in Figure 4. According to early models of settlement for the 'Ewa Plain (McAllister 1933), one might expect evidence of dryland agriculture such as planting holes and pit features associated with temporary or extended-use C-shaped shelters, *ahu*, and trail remnants gradually diminishing *makai* to *mauka* across the project area. More recent archaeological research *makai* of the project area (Hommon and Ahlo, Jr. 1983; Jayatilaka et al.

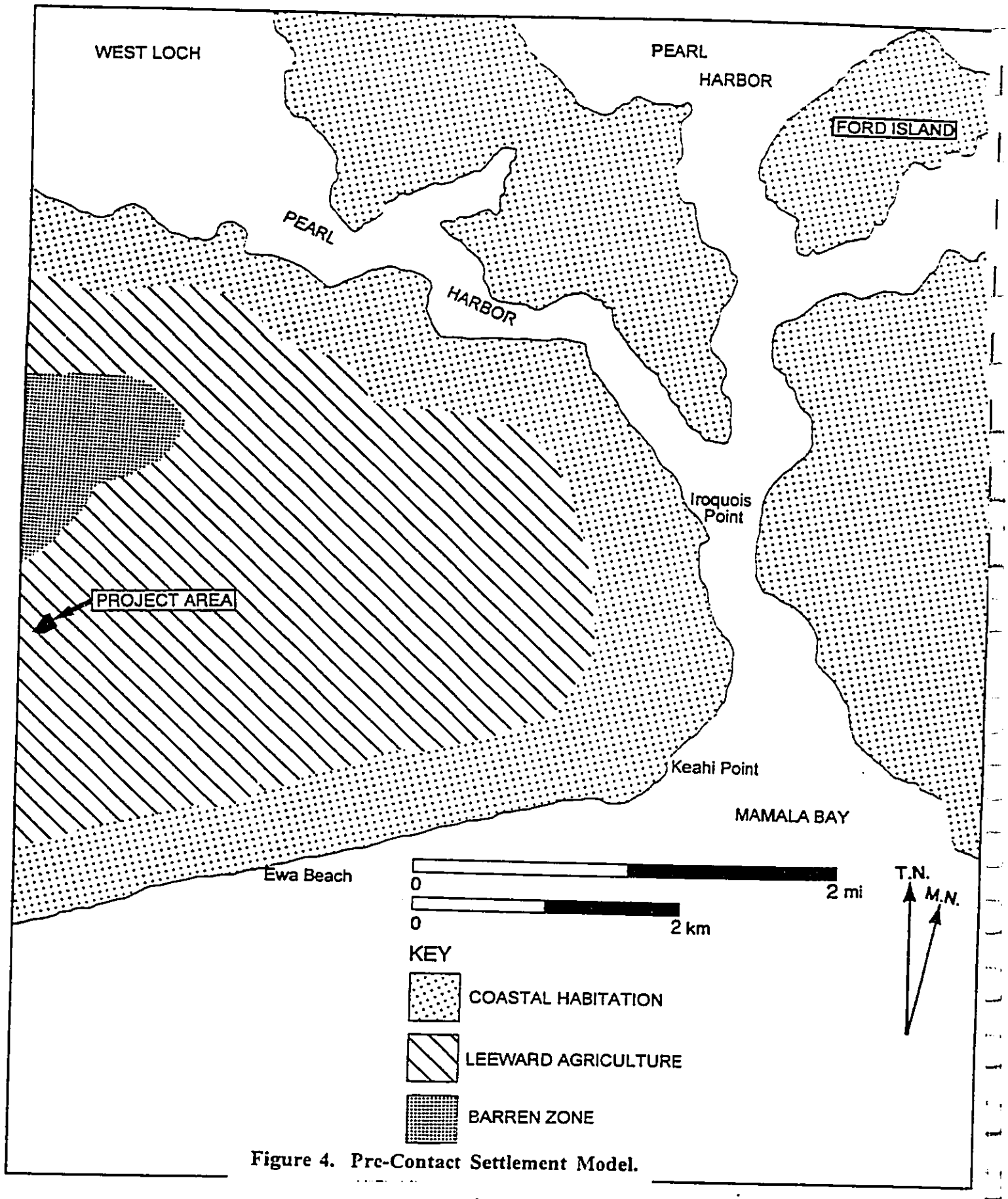

Figure 4. Pre-Contact Settlement Model.

1992) suggests this area was not subject to any utilization resulting in modification of the landscape. Survey and testing along the coast (Davis 1988), however, indicated this was the zone of most intensive habitation.

A BRIEF HISTORY OF HONOULIULI, 'EWA

INTRODUCTION

The subdistrict or *ahupua'a* of Honouliuli formerly consisted of approximately 43,400 acres (Hawai'i [Ter.] Commission of Public Lands, 1929:765-769). An *ahupua'a* was a traditional Hawaiian concept of land division, and Honouliuli is where the Hawai'i Prince Golf Course is proposed to be constructed.

Honouliuli was a vast *ahupua'a* compared to the other 12 subdistricts of the 'Ewa district (Figure 5). The *ahupua'a* of Halawa, for example, consisted of less than 9,000 acres (ibid., 764). However, because much of Honouliuli consisted of an ancient coral reef platform five miles wide at 'Ewa (Macdonald and Kyselka 1967:10), fertility of vast areas of Honouliuli was probably of marginal agricultural value to pre-1778 Hawaiians. A description of the Honouliuli area in 1793 by British naval Captain George Vancouver noted this lack of fertility, but Vancouver also cited testimony as to the agricultural productivity in the area:

> The part of the island opposite to us was low, or rather only moderately elevated, forming a level country between the mountains that compose the east [the Ko'olau range] and west [the Wai'anae range] ends of the island. This tract of land was of some extent but did not seem to be populous, nor to possess any great degree of natural fertility; although we were told that at a little distance from the sea, the soil is rich, and all necessaries of life are abundantly produced. [1798 (3):361]

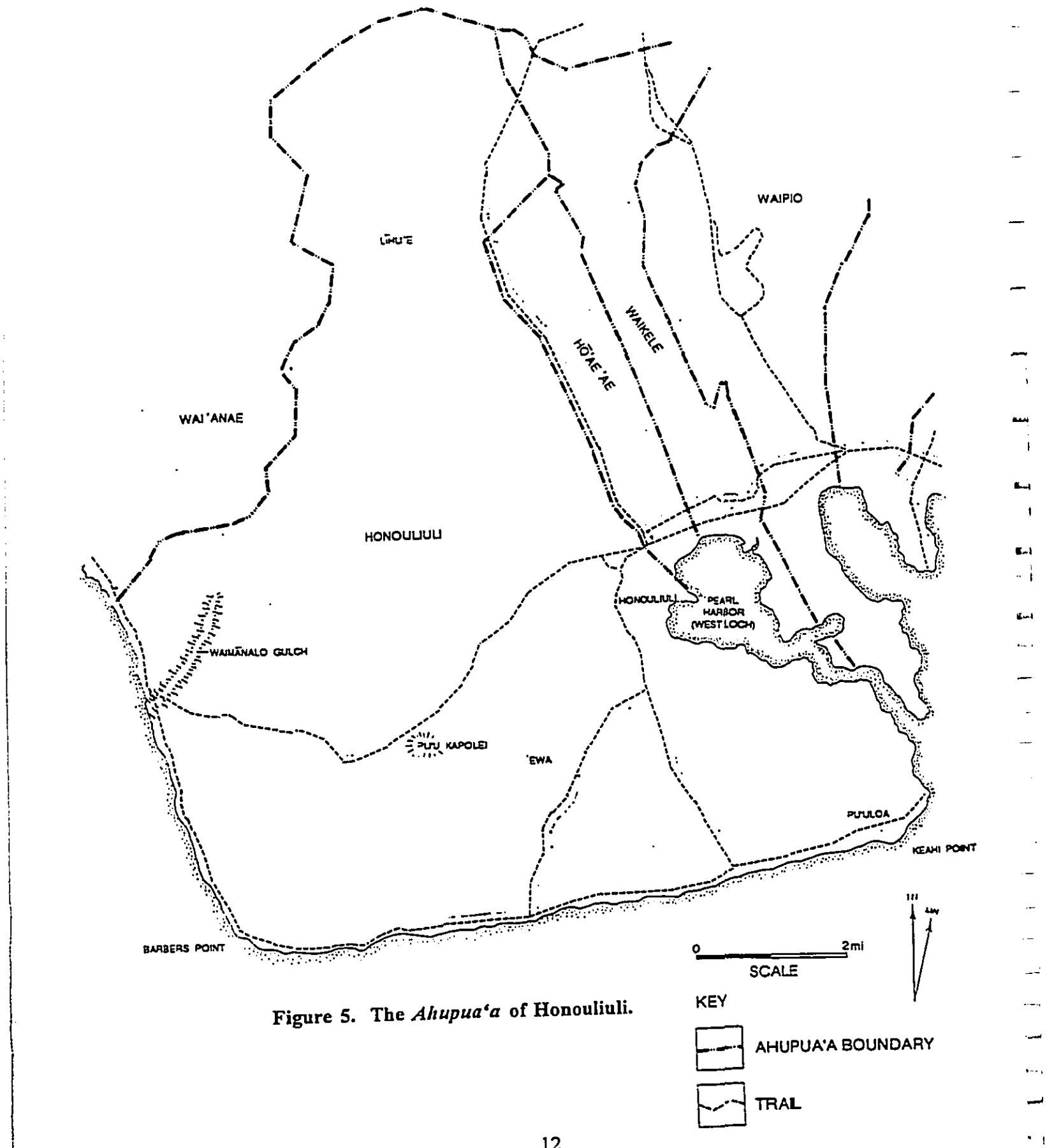

Figure 5. The *Ahupua'a* of Honouliuli.

AGRICULTURAL RESOURCES

The main village of Honouliuli was located in an agriculturally productive area that today can be described as adjacent to West Loch of Pearl Harbor. In 1825, Lieutenant C. R. Malden and J. Frembly of the British Navy surveyed and mapped this main village (Figure 6). This area was also noted as the "Ewa taro lands," according to E. S. C. Handy:

> Large terrace areas are shown on the U.S. Geological Survey Map of Oahu (1917) bordering West Loch of Pearl Harbor, the indication being that these are still under cultivation. I am told that taro is still grown here. This is evidently what is referred to as 'Ewa taro lands'. [1940:82].

In addition to the main Honouliuli village area, agriculture also occurred at the higher elevation levels such as at Lihu'e (Figure 5) and throughout the *ahupua'a*. For example, in the area of the coral plains (an area that includes the proposed golf course), the growing of crops was noted by McAllister (1933) well into the twentieth century:

> It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. [1933:109]

AQUACULTURAL RESOURCES

The *ahupua'a* of Honouliuli was well-known for its large and productive fishery. This valuable fishery extended from the boundary between the Wai'anae and 'Ewa districts, south and east, to the entrance of Pearl Harbor and continued into West Loch where the fishery dominated most of the loch, excluding the fisheries of the other *ahupua'a*.

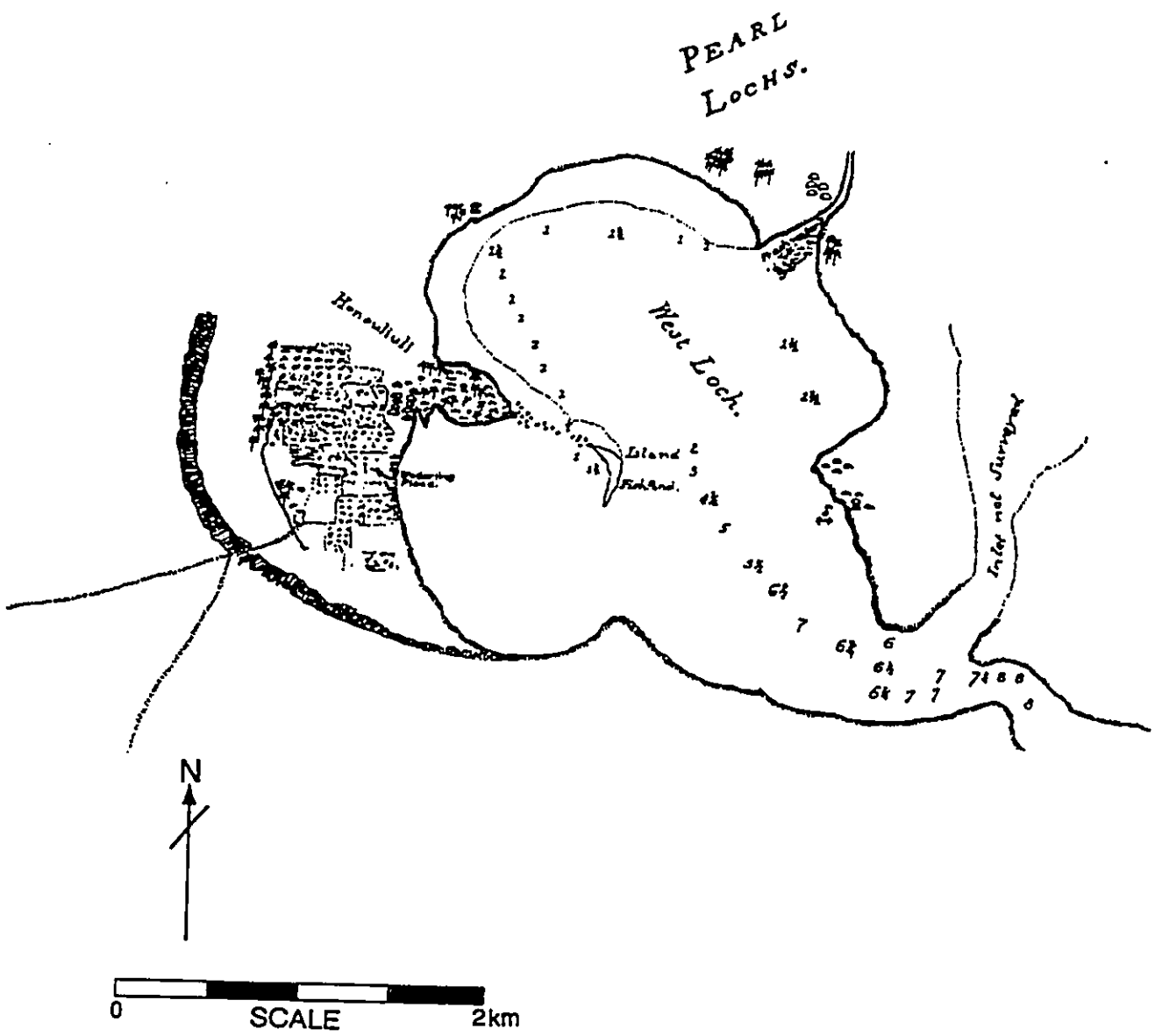

Figure 6. Site of Honouliuli Village.

The Hawaiian name for Pearl Harbor was *Ke-awa-lau-o-Pu'uloa*, "[t]he-many (*lau*) harbors *(awa)-of-Pu'uloa*" (Handy and Handy 1972:469; also, see Pukui 1944). Within Pearl Harbor, the fishery resources were described as follows:

> The salient feature of 'Ewa . . . is its spacious coastal plain, surrounding the deep bays ("lochs") of Pearl Harbor . . . These bays offered the most favorable locality in all the Hawaiian islands for the building of fishponds and fish traps into which deep-sea fish came on the inflow of tidal waters. (ibid.)

The fishery resources of Pearl Harbor contributed to the political strength of the *ali'i* (chiefs) of 'Ewa. According to Handy and Handy:

> . . . The primary reason for 'Ewa's prominence in history and as an *ali'i* stronghold was undoubtedly the existence of the great number of fishponds at different points around Pearl Harbor, which was 'Ewa territory. The Pearl Harbor ponds were stocked with various kinds of fish, but especially mullet, because these inland waters were the summer home of the mullet of Oahu. (ibid., 470)

TRAILS AND THE INTEGRATION OF HONOULIULI

An important aspect of Honouliuli concerned the trails that ran through the *ahupua'a*. These trails served to link the different areas of Honouliuli, as well as to connect Honouliuli with other *ahupua'a* and connect 'Ewa with other districts.

Malden's map of 1825 shows trails leading to and from the main Honouliuli village adjacent to West Loch (Figure 6). Since the areas of habitation within the vast *ahupua'a* of Honouliuli were widely dispersed, the system of trails acted to integrate the various *ahupua'a*, although how much the sacred *Lō ali'i* of Lihu'e (Figure 5) were integrated into the *ahupua'a* is unclear (Kamakau 1991:40).

The trails through Honouliuli also helped to connect the various districts of O'ahu. John Papa I'i noted how the 'Ewa and Wai'anae districts were connected with trails through Honouliuli:

> . . . there were three trails to Waianae, one by way of Puu o Kapolei, another by way of Pohakea, and the third by way of Kolekole. [1959:97]

There was also a trail along the beach at Honouliuli. This trail was noted by Malden on his 1825 map, and was described by I'i:

> The trail from Pu'u-o-Kapolei went by the sandy stretch to meet with the trail that led along the beach from Pu'uloa to Waimanalo. So it went along the beaches all around this island. [John I'i manuscript, pp. 218-220, quoted in Sterling and Summers 1968:2]

RESULTS OF CHANGES IN LAND TENURE AT HONOULIULI, 1848-1875

The land situation in Hawai'i in 1848 was a reflection of events that had taken place in the 1780s and 1790s. In particular, the conquests of formerly independent O'ahu Island by Kahekili of Maui in 1783 and by Kamehameha of the Big Island in 1795 resulted in the displacement of the traditional O'ahu Island chiefly genealogical lines by Maui and Big Island chiefly lines. Therefore, the heirs of Kamehameha, (the conquering warrior from Hawai'i Island primarily) and of Kahekili of Maui inherited the vast amounts of land in the land revolution of 1848 known as the Great *Mahele*.

The *ahupua'a* of Honouliuli was awarded to Kekau'ōnohi, a grandchild of Kamehameha and a great-grandchild of the legendary Kekaulike of Maui, during the *Mahele* of 1848. She received, through Land Commission Award 11216, 43,250 acres or most of Honouliuli (Hawai'i [Ter.] Commission of Public Lands, 1929:765). Upon her death in 1851, Kekau'ōnohi, through her will, left all of her considerable

estate to her third husband, Levi Ha'alelea. Following Kekau'ōnohi's death, Ha'alelea married Amoe A. Ululani Kapukalakala Ha'alelea (McKinzie 1986: Vol. II:104). Ha'alelea died at his home in Honolulu on October 4, 1864 (Hawai'i [State] Archives, Probate 2415). Amoe Ha'alelea inherited part of his estate, but much of the rest of the estate was auctioned off to pay the late Levi Ha'alelea's debts (Dorton 1986:328). Amoe Ha'alelea, one of three children of noted businessman John Ena and Kaikilanialiiwahineopuna, inherited the title to the *ahupua'a* of Honouliuli, which she sold to her brother-in-law, John Harvey Coney, in 1875 for $25,000 (Hawai'i [State] Bureau of Conveyances, Liber 44:52-54), not including the 2,610-acre land section of Pu'uloa that had been previously sold to Isaac Montgomery (ibid.).

JOHN HARVEY CONEY AND HONOULIULI, 1875-1877

After purchasing Honouliuli and other property in 1875 for $25,000, John Harvey Coney profited considerably when he sold Honouliuli in 1877 for $95,000 (Hawai'i [State] Bureau of Conveyances, Liber 52:201-202). The purchaser was James Campbell, whose business acumen in Hawai'i during the last half of the nineteenth century was legendary.

JAMES CAMPBELL AND THE HONOULIULI RANCH, 1877-1889

After purchasing the *ahupua'a* of Honouliuli from John Harvey Coney in 1877, James Campbell established a livestock ranch there (Kuykendall 1967:67). Paul T. Yardley provides a description of Campbell's purchase:

> James Campbell . . . [n]ear the end of 1876 . . . bought Kahuku Ranch, . . . and the following year . . . bought the immense Honouliuli Ranch in central Oahu for $95.000. The latter property included the great 'Ewa plain from Pearl Harbor to Barber's Point and Kahe Point and stretched inland toward Wahiawa as far as the present Schofield Barracks boundary.

> between the top of the Waianae Mountains and Kunia Road. The area around Iroquois Point (on the port side as you enter Pearl Harbor), known as Pu'uloa, had previously been sold off and had come into the possession of James I. Dowsett. (Yardley 1981:100)

During the summer of 1879, Campbell also had the first artesian well in Hawai'i drilled at Honouliuli. Yardley described Campbell's work at his Honouliuli acquisition:

> Campbell immediately set out to fence his property, to build up his herd, and to improve the value of his land. In 1879, in California, he met James Ashley, a well-borer by trade, and brought him to Hawaii. Working with a crude, hand-operated rig, Ashley dug for almost three months behind Campbell's ranch house at Honouliuli, and on 22 September 1879, brought in at a depth of 273 feet the first artesian well in Hawai'i. *Waianiani*, the Hawaiians called it, 'sparkling water'. It was a momentous day in Hawaiian history, for it opened the way to irrigation and cultivation of areas which up to that time were not even prime grazing lands. [1981:101-102]

In 1885, Campbell gave an option to Benjamin Franklin Dillingham to purchase his Kahuku and Honouliuli properties (ibid., 103). This option to have the lands purchased in fee simple by Dillingham was extended several times (ibid., 121). By 1889, Dillingham chose to lease, rather than purchase, Campbell's Honouliuli lands. Campbell and Dillingham concluded a 50-year lease for Campbell's Honouliuli and Kahuku ranches (ibid., 153).

B. F. DILLINGHAM AND THE MODERN DEVELOPMENT OF HONOULIULI

By 1889, B. F. Dillingham had decided to construct a railroad line, the Oahu Railway and Land Company, Limited (OR & L), on the island of O'ahu. Dillingham planned to coordinate the construction of this railroad with the large-

scale development of sugar plantations on the lands leased from Campbell and others.

Chartered by the Hawaiian government in 1889 (Kuykendall 1967:68), O R & L opened to sugar cane cultivation the vast acreage of the western and northern areas of O'ahu. By early 1890, the railroad had been constructed to Pearl City, about eight miles to the west of Honolulu. For the next five years, construction continued in a westerly and northwesterly direction, and through the *ahupua'a* of Honouliuli and the 'Ewa coral plains. The railroad reached Wai'anae in July 1895. From Wai'anae, extending the railroad line involved difficult construction around Kaena Point. By June 1898, the O R & L was extended to Waialua (Yardley 1981:194-95). By January 1899, the railroad line reached Kahuku (ibid., 100).

The promoters of O R & L, particularly Dillingham, played an active role in the development of sugar plantations along the route of the railroad. They subleased parts of the leased Campbell lands to the developers of the 'Ewa Plantation Company and the Kahuku Plantation Company, both of which were incorporated in 1890.

THE 'EWA PLANTATION COMPANY

The 'Ewa Plantation Company was established on the Honouliuli lands lying below 200 feet above sea level (Kuykendall 1967:68). 'Ewa Plantation was the first all-artesian plantation in Hawai'i, with 35 wells drilled during the first eight years and twice that number drilled subsequently (ibid.. 69). Through the sublease from Dillingham:

> . . . 'Ewa got possession of the lands of Honouliuli between the coral rim and an elevation of 200 feet, plus 2,500 acres of coral land and a large lot fronting on the west loch of Pearl Harbor. 'Ewa would depend on artesian wells for irrigation, and the 200-foot elevation boundary represented the maximum height to which it was considered feasible to pump this water. . . . (ibid., 156)

Despite a slow start, by 1898 the plantation had become a profitable venture. Yardley summarized the progress:

> 'Ewa Plantation had recovered from its nearly disastrous start and was busily making its investors rich. A year later its original $100 shares (by then split five for one) had a market value of $700 and were paying annual dividends of 60 percent on the original price. (Yardley 1981:196)

In 1897, the Oahu Sugar Company at Waipahu was incorporated (again promoted by Dillingham) on other parts of the lands that Dillingham leased from Campbell. Oahu Sugar was established on Honouliuli lands lying above the 200-foot elevation level and on other adjoining lands (Kuykendall 1967:69). Similar to 'Ewa Plantation, the Oahu Sugar Plantation proved to be a profitable venture (Yardley 1981:192).

The 'Ewa Plantation Company remained in business until 1970 when its lease to the Honouliuli lands of the Campbell Estate was not renewed. The plantation, "once legendary for its dividends. . . was absorbed into the Oahu Sugar Company. Oahu Sugar, long one of Hawai'i's premier plantations, now cultivates a greatly expanded acreage, as part of Amfac, Inc." (Yardley 1981:317).

AMERICAN MILITARY ACTIVITIES AT PEARL HARBOR, 1908-1941

The United States Naval Station at Pearl Harbor was authorized by the American Congress in 1908 (Day 1984:158). With the outbreak of World War II in 1941, the U.S. Navy took over the entire rim of Pearl Harbor (Yardley 1981:161).

Prior to World War II, civilians lived at and enjoyed Pearl Harbor.

> . . . Many *kama'aina* ('native-born') families, wrote Yardley, still recall with delight and affection the joys of living on an unpolluted Pearl Harbor. World War II ended this happy way of life . . . (ibid.)

SUMMARY

Honouliuli was an *ahupua'a* of the 'Ewa district and was a productive area for the residents who lived there prior to Western contact (pre-1778). Honouliuli was rich in resources such as agriculture and aquaculture, and was the home (at Līhu'e in Honouliuli) of the sacred Lō order of O'ahu Island chiefs.

During the decades following Western contact, however, the independence of O'ahu Island was lost to the conquering chiefs of Maui and Hawai'i Islands. Also, in the *Mahele* of 1848, Kekau'ōnohi, a direct descendent of the conquering chiefs, gained title to the *ahupua'a of* Honouliuli.

Kekau'ōnohi died in 1851, leaving her lands to her third husband, Levi Ha'alelea. After his death in 1864, his wife, Amoe A. Ha'alelea, inherited Honouliuli. She sold it in 1875 to her brother-in-law, John Harvey Coney, who profited from the transaction when he sold Honouliuli in 1877 to James Campbell.

Between 1877 and 1889, Campbell used his lands at Honouliuli as a livestock ranch. In 1889, Campbell leased Honouliuli to railroad promoter Benjamin Franklin Dillingham who, in turn, subleased the lands at Honouliuli, which lay below a 200-foot elevation, to the 'Ewa Plantation Company.

By the turn of the century, the 'Ewa Plantation Company became one of the most profitable plantations in the islands. 'Ewa Plantation was unique in that it depended on artesian wells for irrigation of its sugar crops. 'Ewa Plantation remained in business until 1970 when the Oahu Sugar Company, established in 1897, absorbed all of its interests at Honouliuli.

The area of Honouliuli bordering Pearl Harbor to the east was taken over by the United States Navy with the outbreak of World War II. In fact, the Navy took over all of the lands bordering Pearl Harbor, including those of other *ahupua'a* at 'Ewa.

Today, Honouliuli is no longer thought of as of an *ahupua'a*, a self-sufficient and independent land unit. Instead, under the prevailing Western concept of land

ownership instituted with the *Mahele* of 1848, Honouliuli is becoming a developing urban area for the expanding population of Honolulu and O'ahu.

RESEARCH DESIGN

SCOPE OF WORK

The objectives of the current project are to assess the potential for archaeological resources in the project area and to facilitate interpretation of any cultural remains encountered during reconnaissance survey. The following tasks were undertaken:

1. Literature and Documents Search. A study of historical documents and literature regarding land use and occupation of the parcel was completed prior to field work.

2. Surface Reconnaissance. A walk-through survey of the parcel was conducted to determine the presence or absence of any surface cultural remains.

3. Report Preparation. A final report summarizing the results of the documents search and surface reconnaissance was prepared.

METHODS AND PROCEDURES

The archaeological survey was conducted by a crew of two archaeologists. Aerial photographs and a map of the project area provided by William E. Wanket, Inc. were utilized to locate the parcels in the cane field.

Access to the project area was by both cane haul roads and paved roads, such as Fort Weaver Road. Areas inaccessible due to dense growths of cane were examined from the vehicle and then reexamined later on foot. One north-to-south-oriented transect was performed by vehicle across the parcel to the west of Fort Weaver Road.

RESULTS

The surface reconnaissance survey confirmed that this parcel has been used extensively over the past 100 years for the cultivation of sugar cane. One large topographical depression is still visible near the western boundary, outside the project area, and is almost completely filled with alluvium and planted in sugar cane.

The quarrying operation has wrought extensive landform changes to the portion of the project area that it occupies. Here, the alluvium has been stripped to expose the karst substrate, then bulldozed into large piles for processing.

No evidence of archaeological remains were observed in the whole project area.

DISCUSSION

On the 'Ewa plain, along the coastline, many archaeological sites have been recorded in recent years, indicating that the area was settled by Hawaiians and was once rich with cultural activities. Archaeological evidence from these sites along the coast suggests that fishing and agriculture were the main subsistence activities occurring in this zone.

In contrast, the current project area, which is situated approximately 1 mi (1.5 km) from the coast, yielded no pre-Contact archaeological remains during this survey. Based on soil survey maps and expectations from previous archaeological research, the lack of pre-Contact archaeological sites nearby could be the result of the area being cleared and "filled" during the historical period, followed by the extensive agricultural disturbance over the last 30+ years. The lack of any subsurface archaeological remains observed during testing suggests this area of the intermediate zone (between the coast, the uplands, and Pearl Harbor) may never have been inhabited due to its proximity to more productive ecotones.

It is known that sinkholes in the karstic 'Ewa Plain contain paleontological

CORRECTION

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

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It is known that sinkholes in the karstic 'Ewa Plain contain paleontological

remains of extinct species of birds, and that some of these species were an important resource exploited by pre-Contact inhabitants of the area (Davis 1988; Davis et al. 1986; Sinoto 1976, 1979). It is also recorded that some sinkholes in the nearby area were modified for use by pre-Contact Hawaiians (Davis 1988). The large, but shallow, depression on the western boundary may be one such sinkhole. It is impossible to determine this through surface examination, as these depressions are covered with a layer of alluvium upon which sugar cane is being grown.

RECOMMENDATIONS

No further pre-construction archaeological procedures or monitoring procedures during construction are recommended for this parcel. However, if construction-related excavation activities expose potential archaeological/paleontological objects and/or features, the Historical Preservation Division of the State Department of Land and Natural Resources (DLNR) should be notified immediately.

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APPENDIX B

Impact on State and County Revenue and Expenditures

Decision Analysts Hawaii, Inc.

PROPOSED LAULANI 20-ACRE COMMERCIAL SITE:
IMPACT ON STATE AND COUNTY REVENUES AND EXPENDITURES

PREPARED FOR:

The James Campbell Estate

PREPARED BY:

Decision Analysts Hawaii, Inc.

December 1993

CONTENTS

TABLES

EXECUTIVE SUMMARY

The Laulani 20-Acre Commercial Site project proposed by The Estate of James Campbell will strengthen State and County finances. For the State, construction activity will generate approximately $1.1 million in tax revenues, measured in 1993 dollars. Upon completion of the project, State revenues are expected to exceed expenditures by about $2.3 million per year. Currently, the State derives negligible tax revenues from the sugar operations on the property.

For the County, revenues from rollback taxes due to the withdrawal of the land from agriculture will be about $100,000. At project completion, revenues to the County are expected to exceed expenditures by $300,000 per year. This compares with about $150 per year derived from property taxes on the parcel when used for agriculture.

In view of the beneficial impact on State and County finances, mitigating measures are not necessary. Furthermore, there are no unresolved issues.

LAULANI 20-ACRE COMMERCIAL SITE: IMPACT ON STATE AND COUNTY REVENUES AND EXPENDITURES

The Laulani 20-Acre Commercial Site project, proposed by The Estate of James Campbell, will be located in Ewa between Ewa by Gentry and Ewa Beach, and will front and lie to the west of Fort Weaver Road. Impacts of this project on State of Hawaii and City & County of Honolulu revenues and expenditures are summarized in this report. All values are expressed in 1993 dollars.

PROJECT ASSUMPTIONS

The assumptions made about the Project that are relevant to this analysis are summarized in Table 1. As indicated, the Laulani 20-Acre Commercial Site will offer approximately 138,000 square feet (sf) of commercial space, along with associated parking. It will be a neighborhood commercial center designed to serve residents of the planned Laulani and Fairways communities. Residents of other nearby communities may also shop at the center, including those from Ewa Beach, Ewa Marina, Ewa Gentry, Ewa Villages and West Loch.

Tenants may include such establishments as: a supermarket, a drugstore, an automobile service station, an auto parts store, a variety store, a hardware store, various specialty stores, a bookstore, family and fast-food restaurants, ice-cream/yogurt parlors, clothing stores, hair salons, a video rental store, a veterinarian clinic, a pet store, a garden supply store, branch banks, etc.

Construction is projected to continue over approximately a 2-year period, with the total construction cost estimated at about $24.2 million for all onsite and offsite

improvements and buildings, but excluding the value of the land, interest costs, and sales commissions. Profits from construction are estimated at $1.9 million. Construction employment is expected to average about 45 jobs, with total construction payroll of about $2 million per year. Construction figures will fluctuate greatly from one month to the next, depending upon the phase of construction.

At full development, the property-tax base for the Laulani 20-Acre Commercial Site is estimated to be about $34.5 million. Retail sales are estimated at $48.3 million per year, rents at $3.3 million per year, and profits at $2.6 million per year. On-site employment is projected to be about 550 jobs with a payroll of about $10.2 million per year.

STATE

Existing Revenues

Currently, the State derives negligible tax revenues from the sugar operations on the property inasmuch as sugar is exempt from excise taxes, and Oahu Sugar Co., Ltd. is marginally profitable. The sugar operations, along with taxes which they generate, are scheduled to end in 1995.

Projected Revenues

Taxes on Construction Activity

The impact of the project on State revenues and expenditures is summarized in Table 2. As indicated, construction activity is expected to generate a total of about $1.1 million in excise taxes and corporate-income taxes. Additional construction-related revenues to the State will include individual income taxes which are not estimated.

Revenues, Full Development

At full development, the increase in State tax revenues is expected to be about $2.3 million per year, with about $2.1 million per year being derived from excise taxes

and about $200,000 per year derived from corporate income taxes. Taxes on tobacco, liquor, insurances, and fuel for delivery trucks are not estimated. Also, income taxes received from onsite employees are excluded from the estimate of State revenues, since government expenditures to provide services to these employees are also excluded.

Projected Expenditures

Capital Improvements and Debt Service

No major State-financed facility to support the project is anticipated beyond that which already exists, or which will be built in any case. For example, State highways and freeway interchanges are to be improved or built to support new residential communities in Ewa, with or without the project. Furthermore, these road improvements are to be financed by developers in Ewa, including the "fair-share" contribution of Campbell Estate.

Correspondingly, State debt service for support improvements will be negligible.

Services

Additional State services required to support the project are expected to be negligible. This includes such major expense categories as: general government, freeway maintenance, health services, welfare, education, and housing.

Projected Net Revenues

Net revenues to the State will amount to about $1.1 million in taxes from construction activity, and about $2.3 million per year once the project is fully developed.

Mitigating Measures and Unresolved Issues

In view of the beneficial impact on State finances, mitigating measures are not necessary. Furthermore, there are no unresolved issues.

COUNTY

Existing Revenues

Currently, the County derives about $150 per year from property taxes on the entire parcel when used for agriculture.

Projected Revenues

Rollback Taxes

Table 3 shows the impact of the project on County revenues and expenditures. As indicated, an estimated $100,000 in "rollback" taxes will become due when the property is developed. Rollback taxes are levied on land which has been assessed and taxed at its agricultural value but which is then developed; this tax recovers 10 years of back property taxes based on the difference between taxes computed on the market assessment and the agricultural assessment, plus a penalty of 10 percent.

Revenues, Full Development

At full development, County property taxes from the Laulani 20-Acre Commercial Site are expected to reach about $300,000 per year. Other County taxes and fees—such as the weight-tax on delivery trucks, and liquor licenses and fees—are not estimated.

Projected Expenditures

Capital Improvements and Debt Service

No major County-financed facility to support the project is anticipated beyond that which already exists, or which will be built in any case. As with other projects in Ewa, the developer will provide or finance its fair-share of road improvements, water development and distribution, collector sewers and trunks, and wastewater treatment facilities. Also, the project will not require any new police or fire stations beyond those which will be built in any case. Nor will the project require park improvements.

Correspondingly, County debt service for support improvements will be negligible.

Services

Additional County services required to support the project are expected to be negligible. This includes such major expense categories as: general government, road maintenance, police and fire service, refuse collection, park maintenance, housing, and bus service. Tenants will finance on-site security and private refuse collection. Other services will be provided in the area with or without the project, including police, fire, road maintenance, park maintenance, bus service etc. Finally, user charges will finance other services, such as water-delivery costs.

Projected Net Revenues

Net revenues to the County will amount to about $100,000 in rollback taxes, and about $300,000 per year once the project is fully developed.

Mitigating Measures and Unresolved Issues

In view of the beneficial impact on County finances, mitigating measures are not necessary. Furthermore, there are no unresolved issues.

Table 1.— LAULANI 20-ACRE COMMERCIAL SITE: PROJECT ASSUMPTIONS

[In 1993 dollars]

Item	Amount	
PROJECT DESCRIPTION		
Land Area	20	acres
Floor Area	138,000	square feet
CONSTRUCTION ACTIVITY		
Duration of Construction	2	years
Construction Cost (Estimated at 70% of Increased Property Tax Base, from below. Construction costs exclude the value of land, interest costs, legal fees, etc.)	$ 24.2	million
Profit from Construction Activity (8% of Construction Costs)	$ 1.9	million
Average Construction Employment (1 man-year per 1,500 sf of commercial space)	45	jobs
Average Payroll ($43,500 per job)	$ 2.0	million per year
INCREASED PROPERTY TAX BASE ($250 per sf)	$ 34.5	million
RETAIL SALES, RENTS AND PROFITS		
Retail Sales ($350 per sf)	$ 48.3	million per year
Rents ($2 per sf per month)	3.3	"
Total Retail Sales and Rents (subject to Excise Tax)	$ 51.6	million per year
Profit on Retail Sales and Rents (5%)	$ 2.6	million per year
OPERATING EMPLOYMENT AND PAYROLL		
Employment (4 jobs per 1,000 sf of commercial space)	550	jobs
Payroll ($18,500 per job)	$ 10.2	million per year

Table 2.— LAULANI 20-ACRE COMMERCIAL SITE: IMPACT ON STATE REVENUES AND EXPENDITURES

[In 1993 dollars]

Item	Amount	
REVENUES		
Taxes on Construction Activity		
Excise Taxes (4% of Construction Costs)	$ 1.0	million
Corporate Income Taxes (6.4%)	0.1	"
Total Taxes on Construction Activity	$ 1.1	million
Revenues, Full Development		
Excise Taxes (4% of Retail Sales and Rents)	$ 2.1	million per year
Income Taxes:		
Corporate (6.4% of Retail Sales and Rents)	$ 0.2	"
Personal (not estimated)	--	million per year
Total Income Taxes	$ 0.2	million per year
Other Revenues (not estimated)	$ --	"
Total State Revenues	$ 2.3	million per year
EXPENDITURES		
Capital Improvements		
Highway and Freeway Improvements (fair-share paid by developer)	$ --	million
County Annual Debt Service (5.5%, 20-year bond)	$ 0.0	million per year
Services, Full Development (No significant increase in general government, freeway maintenance, health services, welfare, education, housing, etc.)	$ --	million per year
NET REVENUES		
Construction Activity	$ 1.1	million
Operations, Full Development	$ 2.3	million per year

Table 3— LAULANI 20-ACRE COMMERCIAL SITE: IMPACT ON COUNTY REVENUES AND EXPENDITURES

[In 1993 dollars]

Item	Amount		
REVENUES			
Rollback Taxes ($4,000 per acre)	$	0.1	million
Revenues, Full Development			
Property Taxes ($8.51 per $1,000 Assessed Value)	$	0.3	million per year
Other Revenues (not estimated)		--	"
Total County Revenues	$	0.3	million per year
EXPENDITURES			
Capital Improvements			
Parks (not applicable)	$	--	
Police Station (new substation not required)		--	
Fire Station (new station not required)		--	
Road Access (paid by developer)		--	
Water Wells, Mains, Pumps, and Storage Tanks (fair share paid by developer)		--	
Drainage (paid by developer)		--	
Collector Sewers and Trunks (paid by developer)		--	
Wastewater Treatment Plant Expansion (fair share paid by developer)		--	
Solid Waste Disposal (privately financed via user charges)		--	
Total County Capital Improvements	$	0.0	million
County Annual Debt Service (5.5%, 20-year bond)	$	0.0	million per year
Services, Full Development (No significant increase in general government, police or fire service, road maintenance, sanitation, park maintenance, housing, bus service, etc.)	$	--	million per year
NET REVENUES			
Rollback Taxes	$	0.1	million
Operations, Full Development	$	0.3	million per year

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APPENDIX C

Noise Assessment Study
Darby & Associates

#93-37

ENVIRONMENTAL NOISE ASSESSMENT
FOR
20-ACRE COMMERCIAL SITE
EWA, OAHU, HAWAII

December 15, 1993

Prepared for
WILLIAM E. WANKET, INC.
Honolulu, Hawaii

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

The Commercial Site is expected to serve the shopping and service needs normally provided by a neighborhood shopping center. The project is located near the main daytime approach flight track to Honolulu International Airport. A 60 Ldn aircraft noise contour line crosses the northern corner making the majority of the site in the 60 to 63 Ldn range. However, commercial use of the entire site is in compliance with Federal and State land use guidelines for aircraft noise impact without implementation of special noise mitigation measures.

Presently, the project site has no noise sensitive land uses abutting it, but future development of residential areas north of the 60 Ldn contour line is predictable. Development of the land on the other sides of the property should be compatible with Ldn 60 to 65 noise exposure and, therefore, will probably be developed as additional commercial uses, office buildings, parking areas, golf courses, etc.

Mechanical equipment for air-conditioning, pumps, fans, etc. used in the Commercial Site must comply with State Department of Health (DOH) noise regulations. Standard components and devices for noise mitigation, e.g., noise barriers, duct silencers, acoustic louvers, etc., should be incorporated in the design as required.

The increase in traffic noise levels for housing and other noise sensitive land uses located on Fort Weaver Road due to the Commercial Site is predicted to be 0.5 dB or less and is, therefore, not considered significant.

Mitigation of construction noise would be consistent with the controls required in obtaining a Noise Permit from the State DOH for construction projects.

2. PROJECT DESCRIPTION AND EXISTING CONDITIONS

Figure 1 shows the general location of the proposed 20-acre Commercial Site along Fort Weaver Road. Figure 2 depicts a conceptual layout of the Commercial Site which is expected to serve the shopping and service needs normally provided by a neighborhood shopping center. The land abutting the project site on the three sides other than Fort Weaver Road is presently old sugar cane fields and probably will be developed into residential, commercial or park use. Further to the north is the completed "Sun Terra" residential project. Directly across Fort Weaver Road is the "Hawaii Prince Golf Club" with the proposed "Fairways" site north of it intended for residential development by the City and County of Honolulu. The "Fairways" site and the housing in the "EWA by Gentry" project to the north are still planted with sugar cane.

3. NOISE STANDARDS

3.1 Federal Regulations and Criteria.

- American National Standards Institute (ANSI) S3.23-1980 (R1986), "Sound Level Descriptors for Determination of Compatible Land Use." From Figure 3, it can be seen that office buildings, personal services (business and professional), retail, movie theaters and restaurants are "Compatible" up to 65 Ldn and "Marginally Compatible" up to 75 Ldn. Also wholesale, some retail, manufacturing and utilities are "Compatible" up to 70 Ldn and "Marginally Compatible" up to 80 Ldn. Refer to Appendix I for an explanation of Ldn.

- Federal Highway Administration (FHWA), 23CFR Part 772 (Federal Register, Vol. 47, No. 131/July 8, 1982). Allows that land with Hourly A-Weighted sound level exposures (roughly equivalent to Ldn) of 72 dB are compatible for commercial uses.

- U.S. Department of Defense, "Environmental Protection Planning in the Noise Environment," (AFM 19-10, June 1978). Allows offices (business and professional), commercial and retail stores, movie theaters, restaurants, cafeterias, banks, credit unions, etc. in Ldn 65 to 69; and then recommends 25 dB Noise Level Reduction (NLR) for Ldn 70 to 74.

- U.S. Department of Housing and Urban Development (HUD), "Environmental Criteria and Standards," 24 CFR Part 51, Federal Register, Vol. 135, January 1986. HUD Site Acceptability Standards specify an exterior Day-Night Average Sound Level (Ldn) of 65 dB as a level for residences not requiring any special noise mitigation measures. For residential developments located within a 65 to 70 dB Ldn zone, the standards require the 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." A minimum of 10 dB additional attenuation is required for residential projects exposed to an Ldn of 70 to 75 dB.

3.2 State Department of Transportation, Airports Division (DOT). The local land use compatibility guidelines set forth by DOT specify an aircraft generated 60 dB Ldn as a maximum allowable exposure for residential use without any special mitigation measures (Reference 1). The guidelines discourage residential development in areas exposed to Ldn 60 to 65 dB.

The DOT guidelines also specify 60 dB Ldn as the maximum allowable sound exposure level for school, day care center, and church uses without any mitigation measures. Commercial uses such as retail shops,

restaurants, shopping centers, financial institutions, etc. are allowed in areas exposed to aircraft generated Ldn of 65 dB without any mitigation measures. With noise mitigation measures implemented, such commercial uses are allowed in areas exposed to Ldn as high as 75 dB.

3.3 State Department of Health (DOH). DOH noise regulations specify allowable levels that shall not be exceeded for more than 10% of any 20-minute period (Reference 2). The specified noise limits are a function of the zoning districts and time of day. For the daytime hours of 7 a.m. to 10 p.m., the noise limits are 55 dBA for Residential and Preservation zones and 60 dBA for Apartment, Hotel and Business zones. For the nighttime hours, i.e., 10 p.m. to 7 a.m. of the next day, the noise limits are 45 dBA for Residential and Preservation zones and 50 dBA for Apartment, Hotel and Business zones. The DOH allowable levels are summarized in Appendix II. The DOH also specifies maximum allowable noise levels for vehicles, including trucks (Reference 3).

A "grandfather" clause of the DOH regulations states that the appropriate noise limits at a common boundary between different zoning districts depends "on the order of precedence in which uses were initiated". Thus, in cases where a plot of agricultural land is rezoned for Business use, and later the surrounding plots are rezoned to Residential use, the higher noise limits of the Business zone would apply at the new common boundaries between the Business and Residential areas.

3.4 City and County of Honolulu Land Use Ordinance (LUO). The allowable sound levels specified in the Land Use Ordinance differ from those of the DOH in that they are octave band sound levels instead of A-weighted levels and no temporal factor is involved (Reference 4). See Appendix III for the specified levels.

4. EXISTING ACOUSTICAL CONDITIONS

4.1 Noise Sensitive Areas. The nearest existing noise sensitive area is the community "Sun Terra" located approximately 800 feet north of the project site. Since Oahu Sugar Co. is phasing out in the next few years, the sugar cane land to the north of the project could be developed into residential use as it is exposed to aircraft noise of less than 60 Ldn of aircraft noise. See Figure 4 which is based on Reference 5. The cane fields immediately to the south and west of the project are in the 60 to 65 Ldn range and probably won't be developed into naturally ventilated residential uses, but could be acoustically compatible if noise level reduction measures are implemented to achieve interior levels of 45 Ldn. Acoustically compatible uses without special noise mitigation features could be additional commercial, parking, office buildings, golf courses, etc.

Existing and future noise sensitive areas potentially impacted by traffic generated by the project are residences and schools located along Fort Weaver Road on both the mauka and makai side of the project site.

4.2 Traffic Noise. Noise from traffic on Fort Weaver Road affects residential units along the road to various degrees depending on the setbacks, whether solid walls near the right-of-way exist or not, and whether the homes are one or two-story structures.

On December 1, 1993, traffic noise levels were measured at the entrance to the Hawaii Prince Golf Club (Position No. 1 in Figure 1) and an Leq (10 minutes) of 57.8 dBA was obtained at a distance of 175 feet from the center of the roadway. Traffic counts were obtained simultaneously with the noise level measurements so that the FHWA traffic noise computer model (Reference 6) could be calibrated for predicting future traffic noise levels at various locations along the trafficway.

Ambient noise level measurements were also made in the nearest developed residential area, Sun Terra, to the project site at a location away from Fort Weaver Road (Position No. 2 in Figure 1). The average noise level was 45 dBA during a 5-minute measurement period. This average level was dominated by muted traffic sounds from Fort Weaver Road. Occasionally, local vehicles, caged pet birds, and voices from residents caused short-term noise events with maximum levels ranging from 50 to 60 dBA.

4.3 Aircraft Noise. The project site is effected by noise from aircraft landing at Honolulu International Airport (HIA) on the Instrumented Landing System (ILS) for Runway 08L. Figure 4 shows the ILS flight track and the 60 Ldn noise contours relative to the project site.

Extensive aircraft noise level measurements were made on the project site at Position No. 3 in July 1991 (Reference 8) and are listed in Table I. On December 1, 1993, a sample of ten aircraft overflight measurements taken at Position No. 1 verified that similar aircraft noise events occur today. The estimated Ldn at Position No. 3, based on the 1991 measurements, is Ldn 62 to 63. It is to be noted that usually there are no aircraft movements on the ILS flight track to HIA from 7 pm to 7 am, unless emergencies or repair work occur at the airport.

5. POTENTIAL NOISE IMPACT ON THE EXISTING OR FUTURE NOISE SENSITIVE LOCATIONS DUE TO THE PROJECT DEVELOPMENT

5.1 Additional Traffic Generated by the Project. The calibrated FHWA traffic prediction model was used in conjunction with the traffic data

provided by Pacific Planning and Engineering, Inc. (Reference 7) to estimate the traffic noise level increases, if any, due to project-generated traffic. The results, presented in Table II show that the project-generated traffic will cause noise level increases along Fort Weaver Road of about 0.5 dB. In terms of subjective response to changes in the acoustical environment, the 0.5 dB increase cited above is considered to be insignificant. Projected traffic movements on the Proposed Road at the north side of the Commercial Site shown in Figure 2 are not significant enough to cause potential noise problems.

5.2 Noise Generated by Activities Within the Project Site. Noise due to activities within the Commercial Site varies depending on the type of stores/shops. Airconditioned spaces such as restaurants, video rentals, supermarkets, etc. should only involve parking lot activity noise; whereas, outdoor activities, e.g., auto repair and/or car wash facilities, could generate significantly higher levels of noise. Mechanical equipment, e.g., airconditioning units, pumps, fans, etc. associated with the commercial buildings could also be a source of annoyance to the nearby residents, if not properly controlled.

5.3 Construction Noise. Development of the project site will involve grading and the construction of infrastructure and buildings. The various construction phases of a development project may generate significant noise levels. The actual levels are dependent upon the construction methods and equipment employed during each stage of the process. Typical noise level ranges for construction equipment are shown in Figure 5. Earthmoving equipment, such as bulldozers and diesel powered trucks, will probably be the noisiest equipment used during construction. Any noise impact from these operations on residential areas should, however, be relatively short-term.

6. POTENTIAL NOISE IMPACT ON THE SUBJECT PROJECT

6.1 Aircraft Noise. As discussed in Section 4.3, the project site is currently exposed to aircraft generated noise levels ranging from about 58 to 63 Ldn. All portions of the project site, therefore, are in compliance with both Federal and State DOT guidelines and criteria for commercial land use with respect to aircraft noise impact.

6.2 Traffic Noise. The noise impacted commercial areas in 1998 will be the structures closest to Fort Weaver Road, e.g., at a 200-foot setback from the center line of the highway, noise levels are projected to range from 65 to 66 Ldn; 400-foot setback, 62 to 63 Ldn; 800-foot setback, 59 to 60 Ldn, for the worst-case sound propagation conditions. See Table II. Actually, the closest structures to the highway will serve as acoustic barriers to the commercial areas to the west.

Table II also shows that the projected traffic noise levels on the site will be about 2 dB less if the proposed North/South Road shown in Figure 1 is developed and removes some traffic from Fort Weaver Road.

6.3 Total Noise Impact. If the worst case traffic noise exposure is added to the worst-case predicted aircraft noise on the Commercial Site, a range of 64 to 68 Ldn is obtained. These noise exposure levels are in compliance with all Federal criteria for commercial land use, but exceed the Ldn 65 level suggested by the State DOT Airports Division for aircraft noise alone.

7. NOISE MITIGATION

7.1 Aircraft Noise. Noise mitigation is not necessary for aircraft noise impact on the Commercial Site development.

7.2 Traffic Noise. Noise mitigation is not required, based on the projected traffic noise levels shown in Table II. As stated earlier, all structures built near Fort Weaver Road will act as noise barriers and cast acoustic shadows to areas west of the buildings. Normal construction for stores, banks, and restaurants in this relatively warm and humid portion of Oahu is full closure and airconditioning which usually provides Noise Level Reductions of 20 to 25 dB. Earth berms along the highway could provide 5 to 7 dB more noise reduction to the ground level facades of structures beyond. Creating such berms while grading the parking areas may be a cost effective way of utilizing any excess earth.

7.3 Total Noise Impact. Noise mitigation is not required when combining the projected worst-case traffic and worst-case aircraft noise exposure based on all Federal guidelines and criteria. Actual total noise levels should be significantly less due to reductions in traffic noise afforded by the shielding and diffusion effects of buildings and parked vehicles.

7.4 Noise Generated Within the Project Site. The design and construction of the commercial facilities must consider use of standard noise mitigation devices, e.g., noise barrier walls, duct silencers, acoustic louvers, etc. for air-conditioning equipment, pumps, fans, etc. in order to meet local DOH noise regulations (Reference 2).

7.5 Construction Noise. In cases were construction noise exceeds, or is expected to exceed, the DOH's "allowable" property line limits (Reference 2), 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 3).

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2. *Chapter 43 - Community Noise Control for Oahu*, Department of Health, State of Hawaii, Administrative Rules, Title 11, November 6, 1981.

3. *Chapter 42 - Vehicular Noise Control for Oahu*, Department of Health, State of Hawaii, Administrative Rules, Title 11, November 6, 1981.

4. *Section 3.11, Noise Regulations*, Land Use Ordinance, City and County of Honolulu, October 22, 1986.

5. *Honolulu International Airport Master Plan Update and Noise Compatibility Program*, State Department of Transportation, Airports Division, December 1989.

6. *FHWA Highway Traffic Noise Prediction Model*, FHWA - RD - 77 -108; U.S. Department of Transportation, December 1978.

7. *Traffic Data forForecasted Traffic Numbers for Ewa Commercial Site*, prepared by Pacific Planning & Engineering, Inc., December 7, 1993.

8. *Final Environmental Impact Assessment--Noise - Ewa Subdivision Laulani/Fairways, Ewa, Oahu*, Letter-Report to William E. Wanket by Darby & Associates, October 28, 1991.

TABLE I

LISTING OF AIRCRAFT NOISE DATA OBTAINED AT POSITION NO. 3
JULY 18 -19, 1991

EVENT NUMBER	AIRCRAFT TYPE	SEL	Lmax
1	DC-9	82.1	72.0
2	DC-10	84.0	74.0
3	DC-10	84.0	75.0
4	DC-10	86.3	77.8
5	DC-10	89.4	80.0
6	L-1011	89.0	78.5
7	DC-9	78.7	68.3
8	B-737	80.3	70.4
9	DC-10	82.5	72.8
10	DC-10	91.4	82.5
11	B-747	89.8	79.0
12	B-737	81.3	71.0
13	B-747	91.4	82.3
14	B-737	83.8	74.3
15	2XF-18	96.6	87.8
16	DH-7	80.9	70.5
17	2XF-18	85.4	76.0
18	4XF-18	96.1	87.5
19	B-737	82.7	72.3
20	DC-10	90.1	80.0
21	B-747	91.4	83.0
22	L-1011	89.3	79.3

TABLE II

Leq (60 MIN) or Ldn TRAFFIC NOISE PROJECTION
AT THE 20 ACRE COMMERCIAL SITE FOR THE YEAR 1998

	Condition	Distance from the Centerline of Fort Weaver Road		
		200'	400'	800'
1.	Without Project	66.0	62.9	59.9
2.	With Project	66.4	63.4	60.4
3.	With Project and the North/South Road	64.7	61.7	58.7

Note: Based on projected P.M. peak hour, 96% automobiles, 3% medium trucks, and 1% heavy trucks.

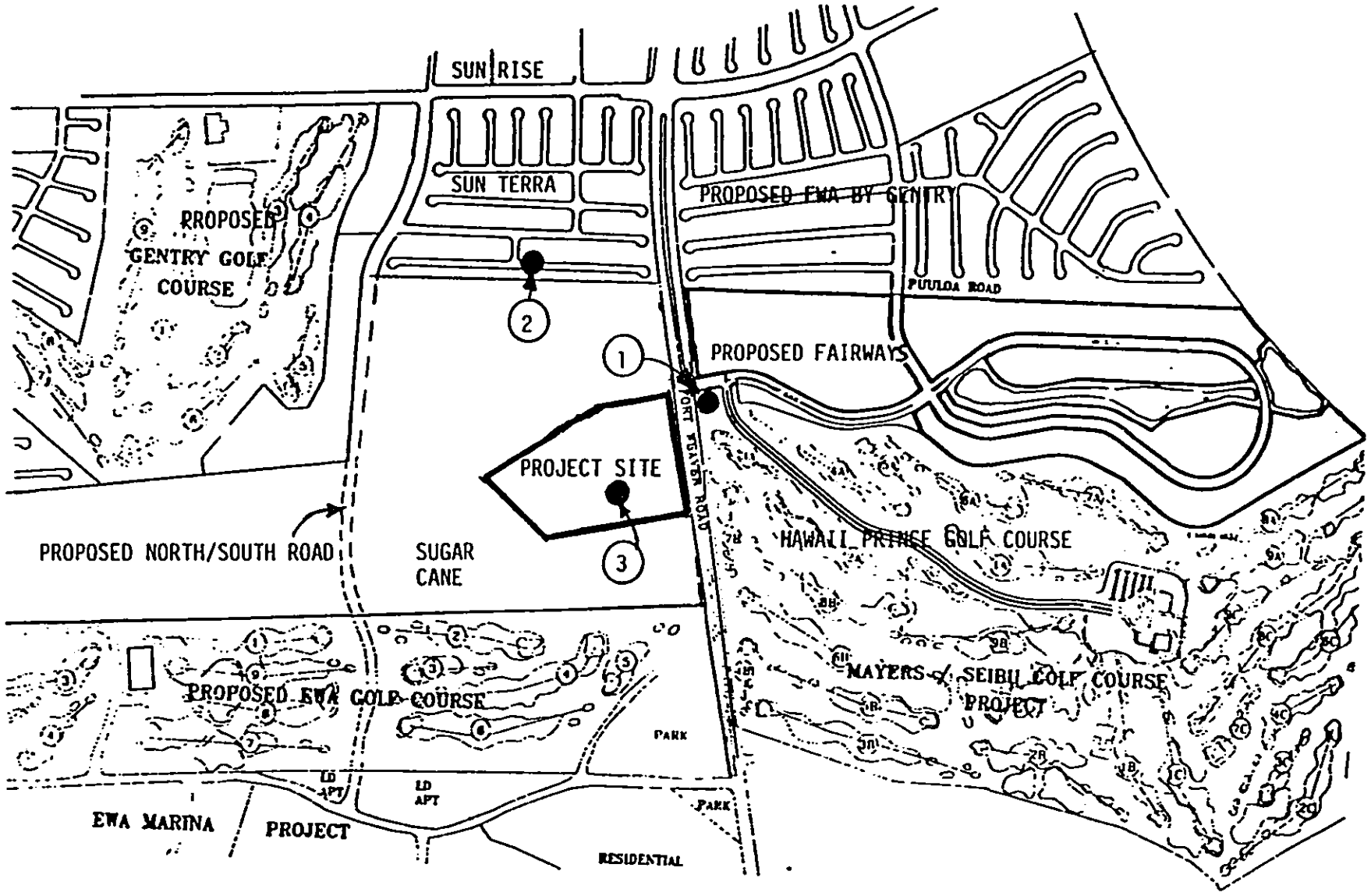
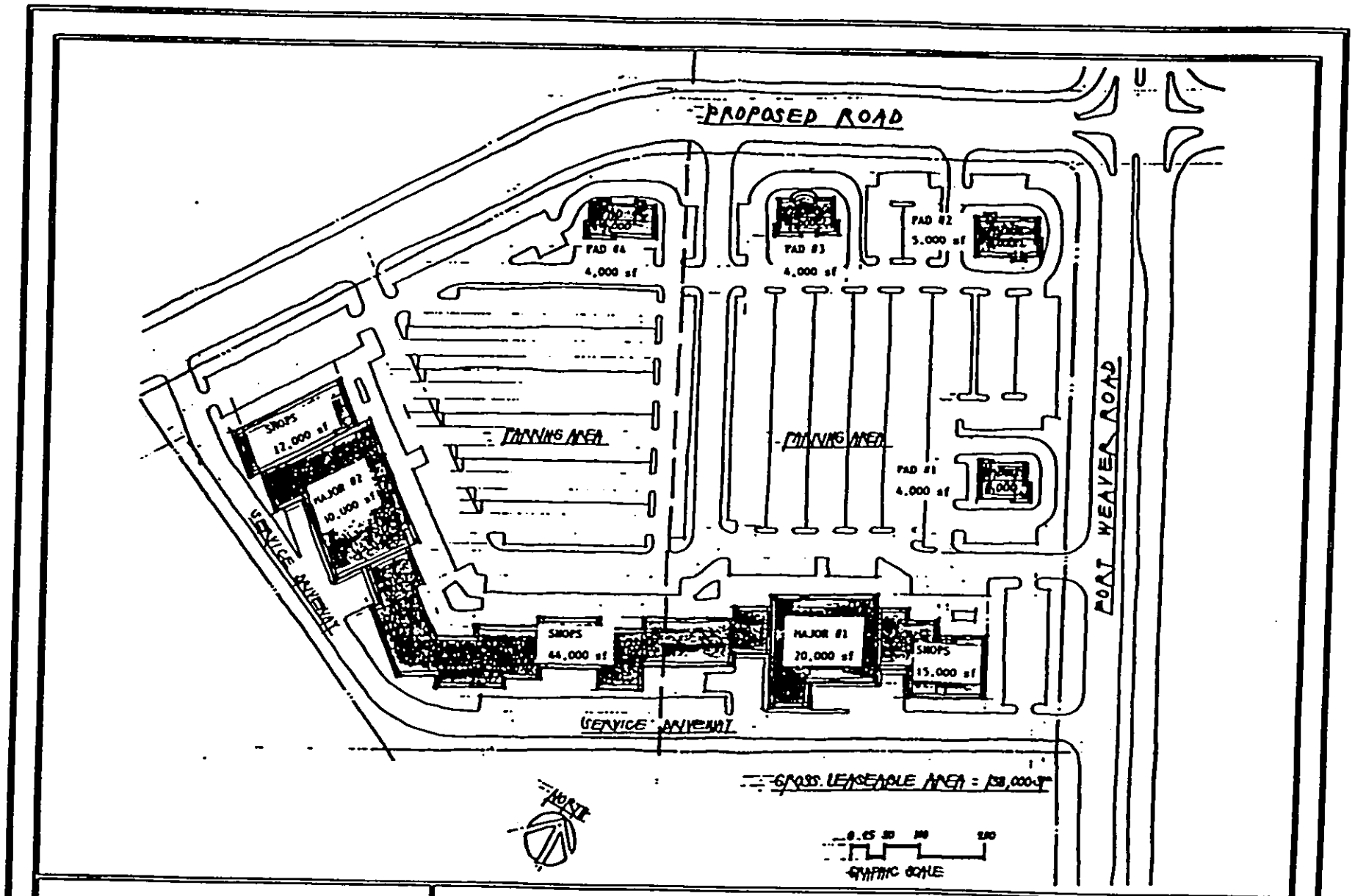


FIGURE 1 - NOISE MEASUREMENT POSITIONS AND LOCATION OF PROJECT SITE OF 20 ACRE COMMERCIAL SITE, EWA, OAHU



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ACOUSTICAL CONSULTANTS

FIGURE 2 - TENTATIVE LAYOUT PLAN FOR PROPOSED 20 ACRE COMMERCIAL SITE IN EWA

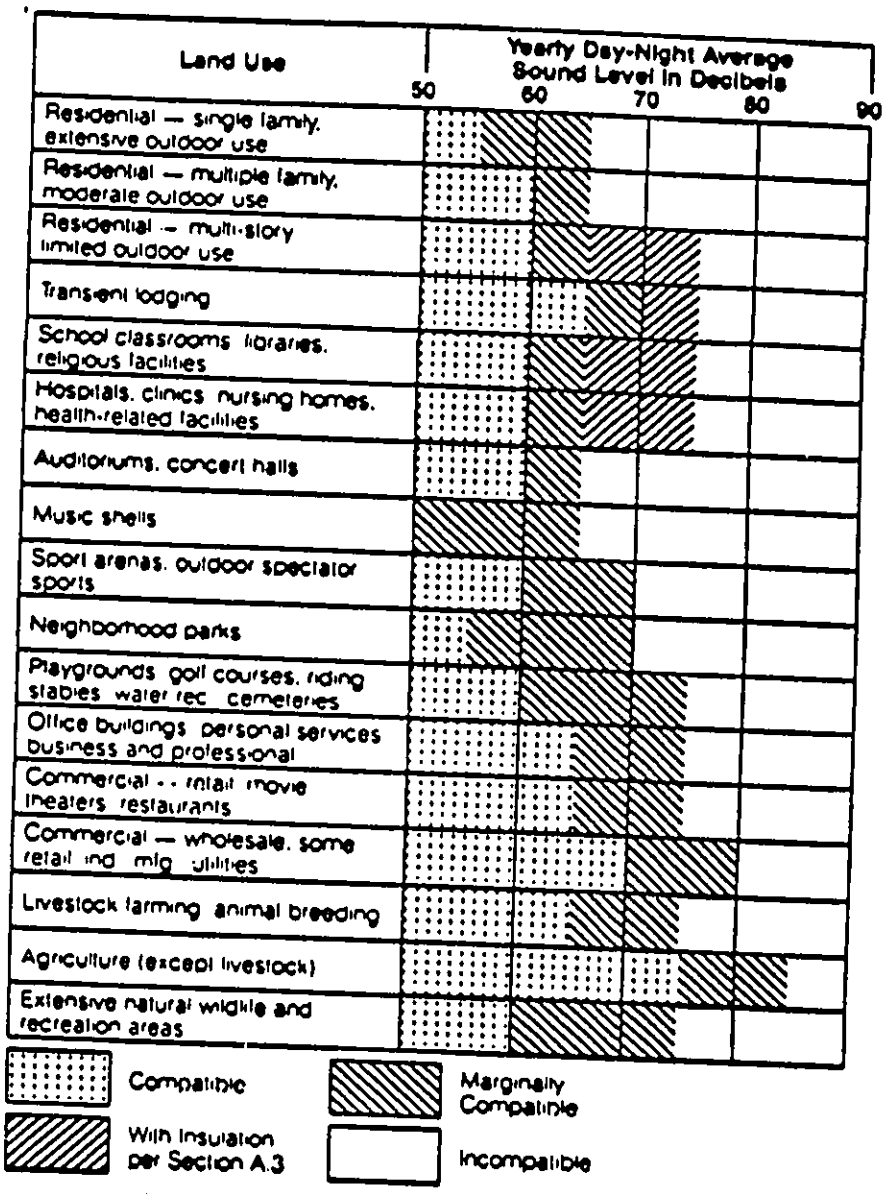

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FIGURE 3 LAND USE COMPATIBILITY AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED

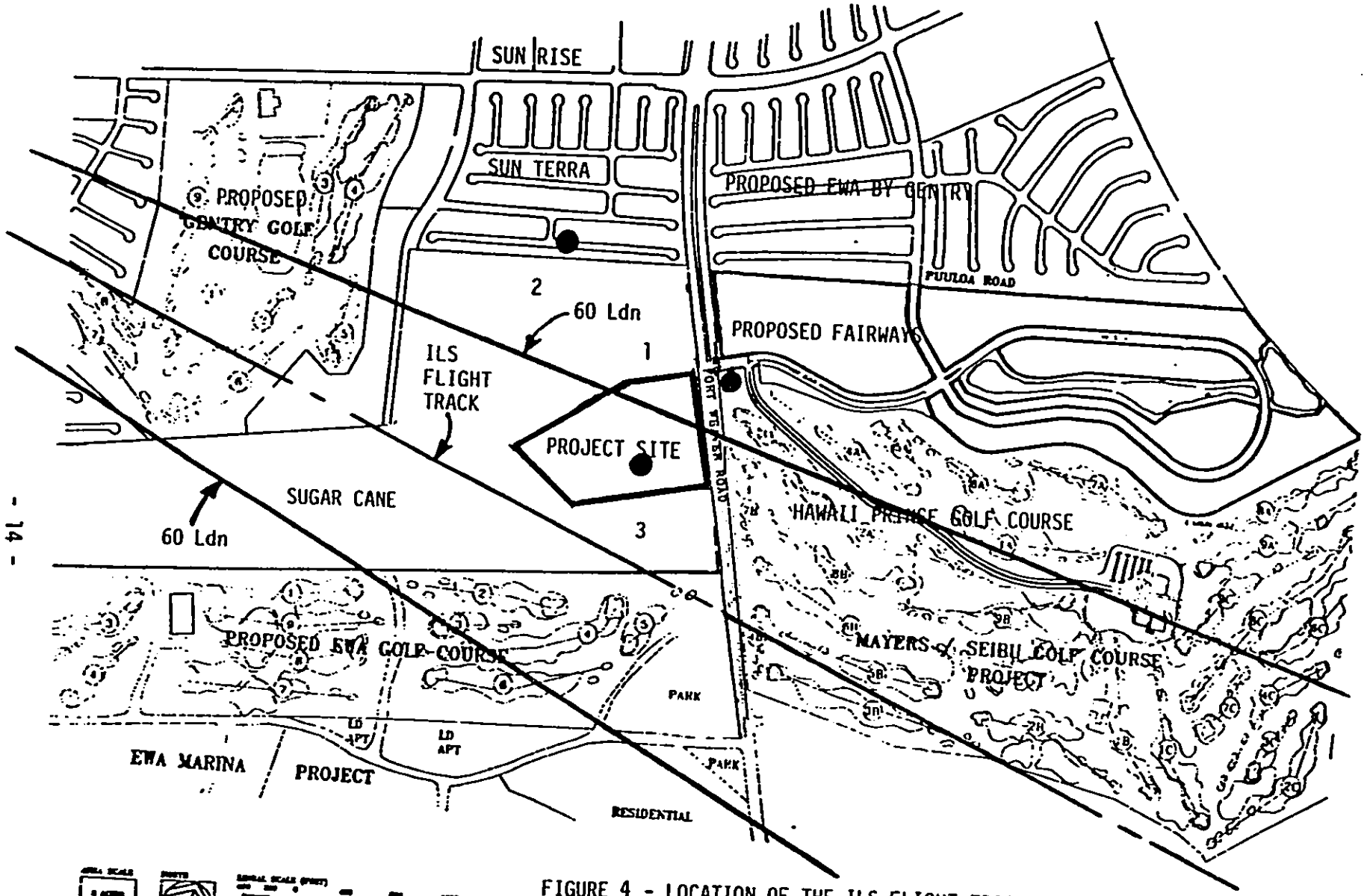
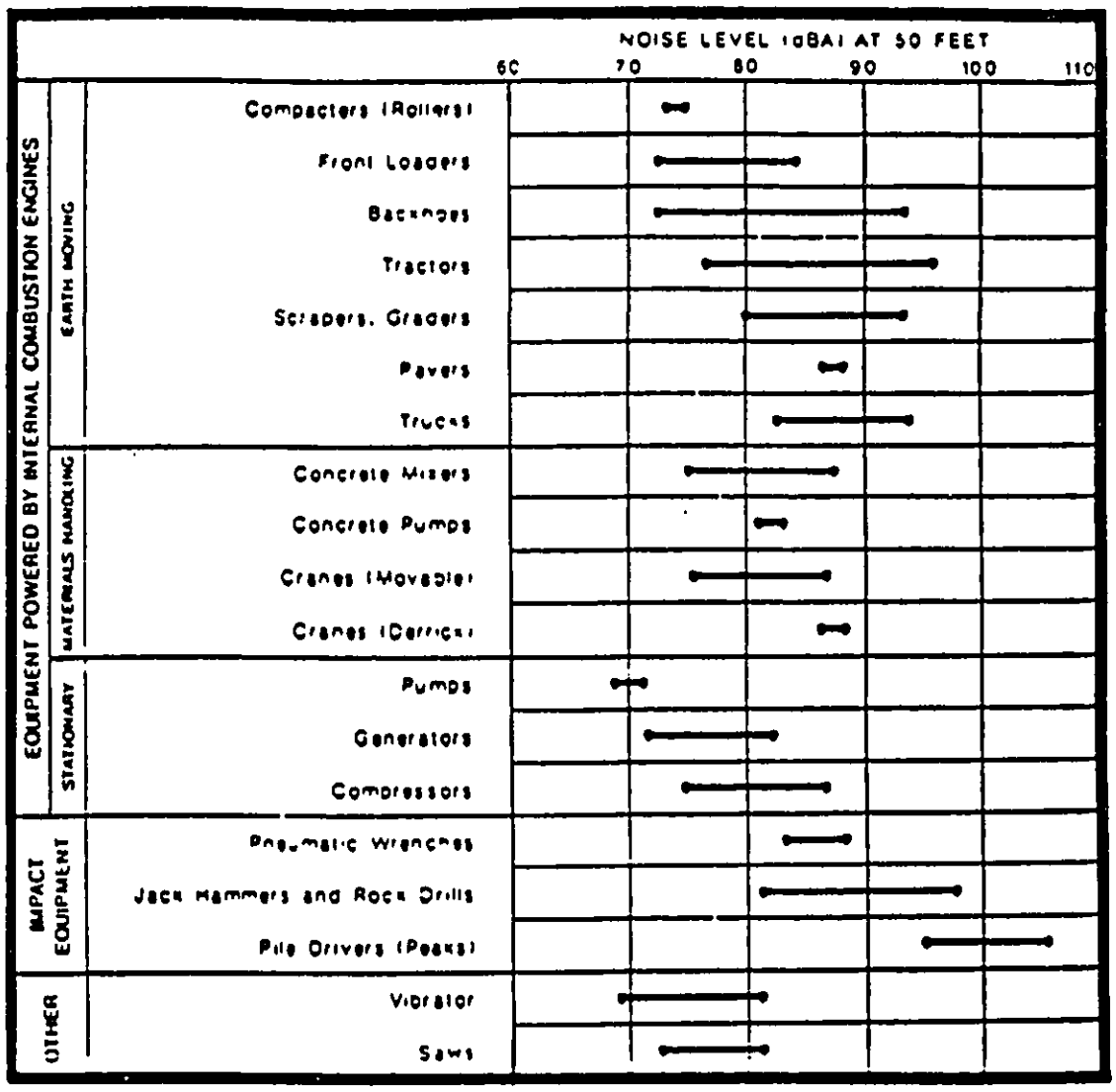


FIGURE 4 - LOCATION OF THE ILS FLIGHT TRACK TO HIA AND THE 1992 HIA 60 Ldn NOISE CONTOURS



Note: Based on Limited Available Data Samples

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FIGURE 5 CONSTRUCTION NOISE LEVELS

SOURCE: U.S. ENVIRONMENTAL PROTECTION AGENCY 1972

APPENDIX I

DAY NIGHT AVERAGE SOUND LEVEL, Ldn

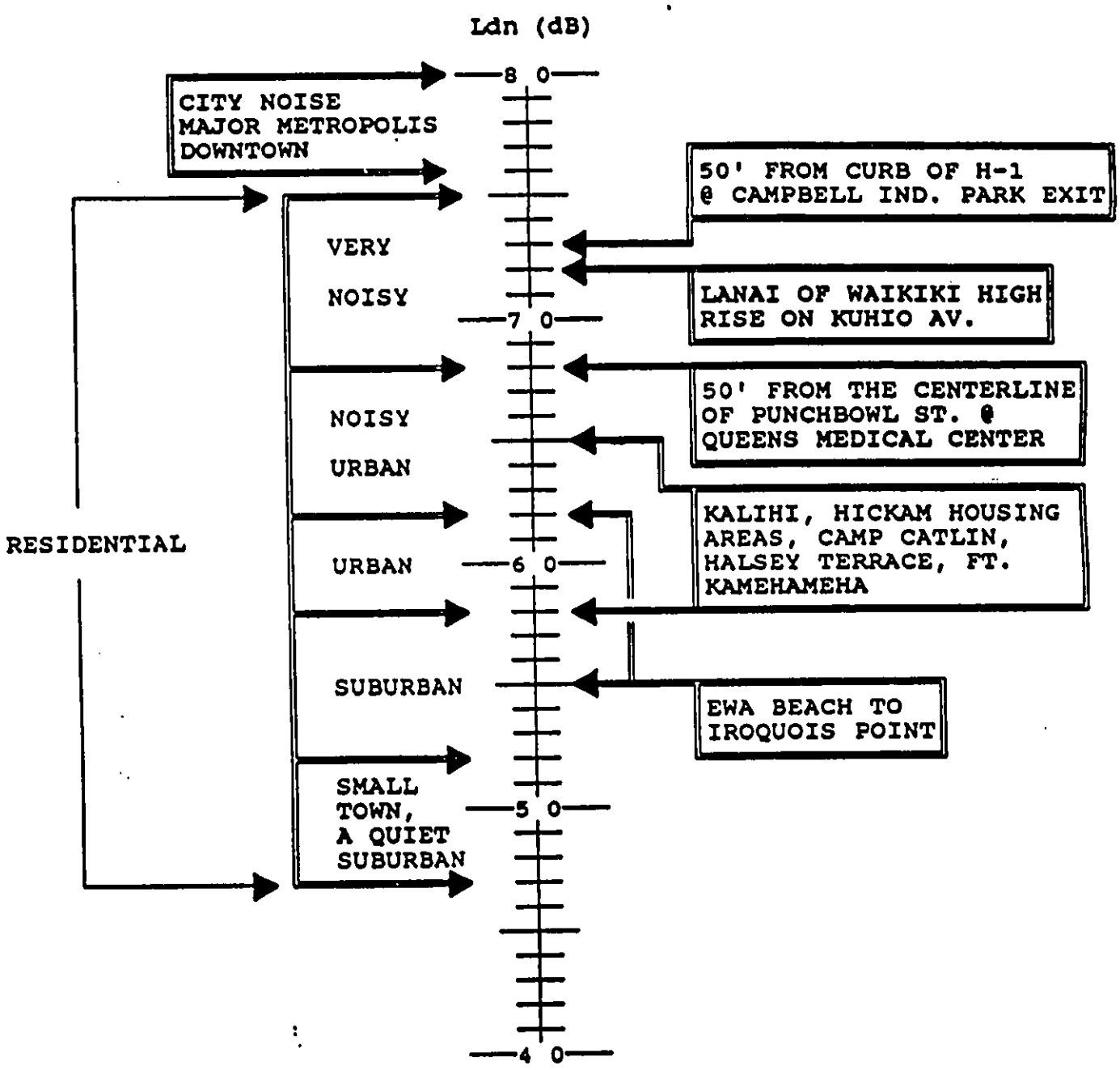
The Day Night Average Sound Level, Ldn, is a commonly used noise metric in assessing land-use compatibility, and is used by federal and local agencies and standards organizations (U.S. Environmental Protection Agency, U.S. Administration, State Department of Transportation, American National Standards Institute, etc.).

The Ldn is an average on an energy basis, of 24 consecutive A-weighted hourly Leq sound levels, to which a 10 dBA penalty is applied for the nighttime and early morning hours (10 pm to 7 am) to account for people's higher sensitivity to noise during this period.

Typical outdoor Ldn values are provided in Figure I-1.

FIGURE I-1

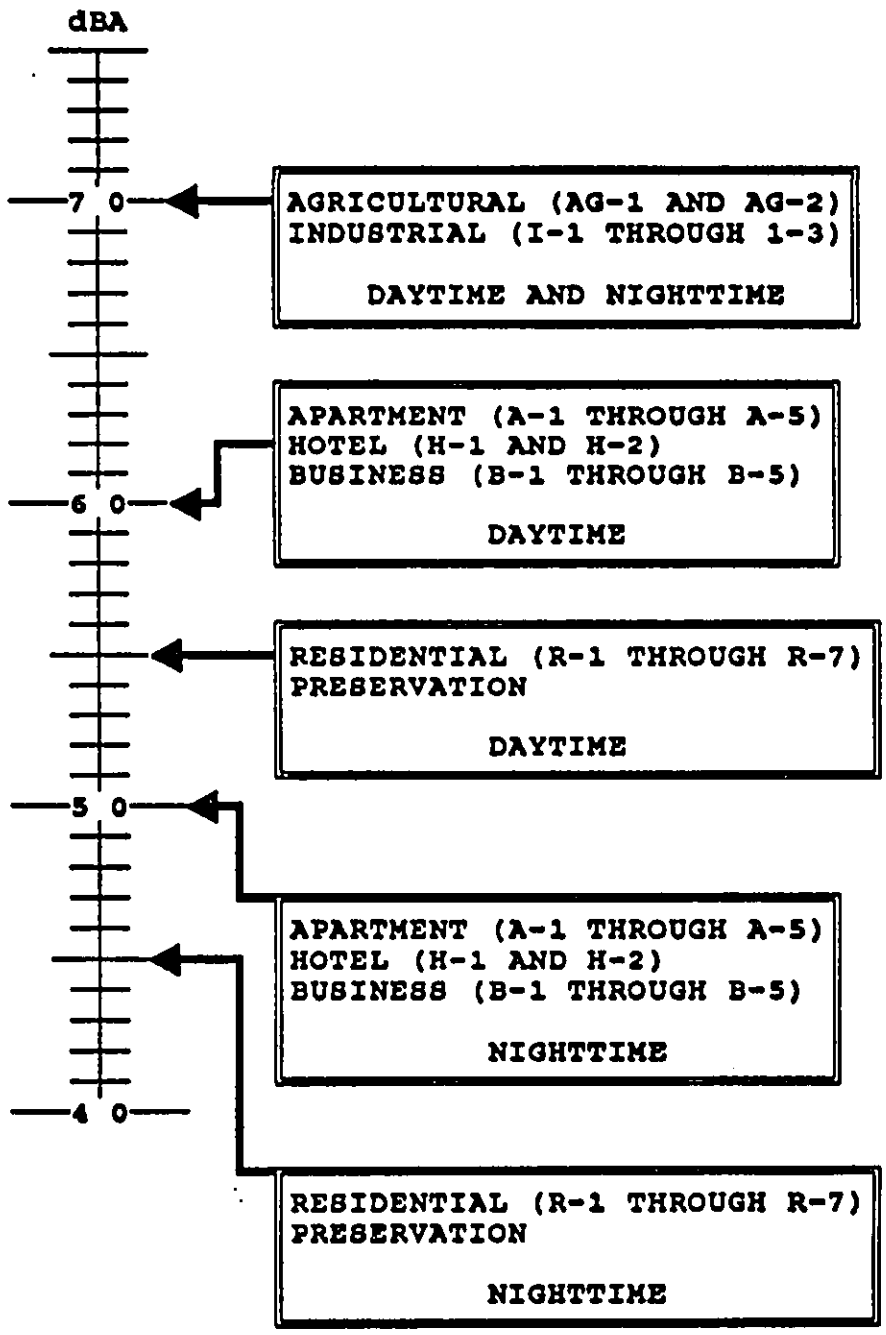
QUALITATIVE DESCRIPTION OF THE AVERAGE DAY-NIGHT SOUND LEVEL (Ldn) AND SELECTED LOCATIONS ON OAHU EXPOSED TO THE INDICATED Ldn LEVEL



APPENDIX II

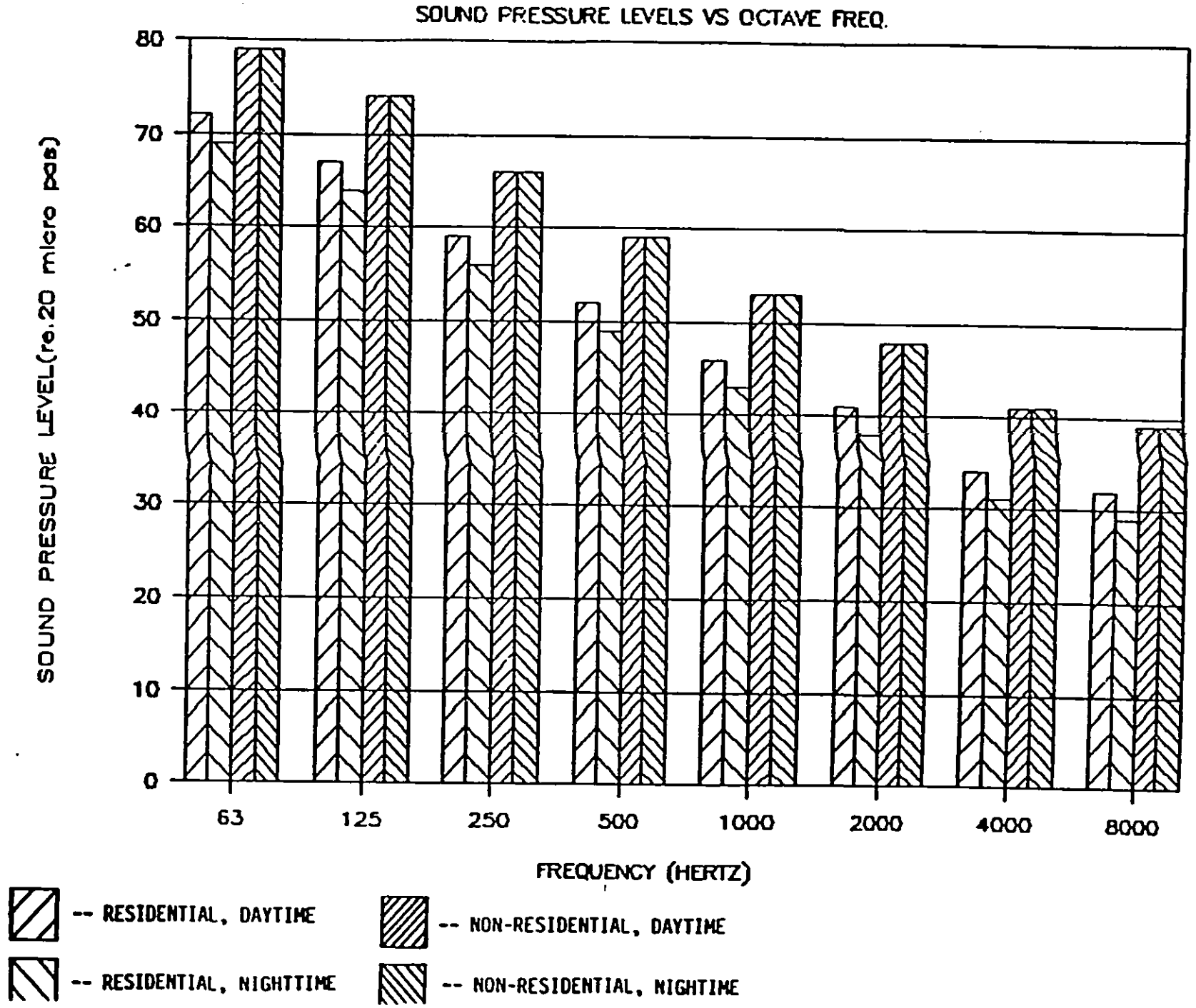
ALLOWABLE NOISE LEVELS FOR VARIOUS ZONING DISCTRICTS
COMMUNITY NOISE CONTROL FOR OAHU
STATE OF HAWAII, DEPARTMENT OF HEALTH

NOTE: THE REGULATION STATES THAT THE ALLOWABLE LEVELS SHALL NOT BE EXCEEDED FOR TEN PERCENT OF THE TIME WITHIN ANY TWENTY MINUTE PERIOD



APPENDIX II.

MAXIMUM ALLOWABLE NOISE LEVELS VS OCTAVE BAND CENTER FREQUENCIES
CITY AND COUNTY OF HONOLULU LAND USE ORDINANCE



APPENDIX D

Air Quality Impact Study
B.D. Neal & Associates

AIR QUALITY STUDY

FOR THE PROPOSED

LAULANI COMMERCIAL CENTER PROJECT

EWA, OAHU, HAWAII

Prepared for:

William E. Wanket, Inc.

December 1993

B. D. NEAL & ASSOCIATES

Applied Meteorology • Air Quality • Computer Science

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CONTENTS

TABLES

TABLES (cont.)

1.0 SUMMARY

The Estate of James Campbell is proposing to develop the Laulani Commercial Center Project on approximately 20 acres of land near Ewa on the island of Oahu. The center would be comprised of typical neighborhood commercial establishments such as retail stores, hair salons, financial institutions, etc. A total of 138,000 square feet of gross leasable space and 750 parking spaces would be included in the project. The project is expected to be constructed and fully occupied by 1998. This study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed facilities. Mitigative measures to lessen project impacts are suggested where possible and appropriate.

Both federal and state standards have been established to maintain ambient air quality. At the present time, six parameters are regulated including: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawaii state air quality standards are more stringent than the comparable national limits except for the standards for sulfur dioxide and particulate matter, which are set at the same levels.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the Ewa Plain area is very much affected by its leeward and coastal situation. Winds are predominantly trade winds from the east northeast except for occasional periods when Kona storms may generate strong winds from the south or when the trade winds are weak and landbreeze-seabreeze circulations may develop. Wind speeds typically vary between about 5 and 15 miles per hour providing relatively good ventilation much of the time. Temperatures in the leeward Oahu area are generally very moderate

with average daily temperatures ranging from about 65°F to 84°F. The extreme minimum temperature recorded at nearby Ewa Plantation is 47°F, while the extreme maximum temperature is 93°F. This area of Oahu is one of the drier locations in the state with rainfall often highly variable from one year to the next. Monthly rainfall has been measured to vary from as little as a trace to as much as 15 inches. Average annual rainfall amounts to about 21 inches with summer months being the driest.

Presently, air quality in the vicinity of the project is mostly affected by emissions from vehicular, industrial, natural and/or agricultural sources. Fort Weaver Road, situated adjacent to the project site, is a major arterial roadway that often carries heavy volumes of traffic. Prevailing winds in the area tend to carry emissions from motor vehicles using this roadway toward the project site. Several industrial sources of air pollution are located a few miles to the west at Barbers Point, but the prevailing winds carry emissions away from the project site more than 80 percent of the time. Natural sources of air pollution that may affect the air quality of the site include the ocean, plants, wind-blown dust and distant volcanoes. Dust and smoke from sugarcane operations nearby also reduce the present air quality of the area.

The State Department of Health operates a network of air quality monitoring stations located at various places around Oahu and elsewhere in the state. Based on data from these stations, it appears likely that both state and national ambient air quality standards are currently being met in the project area except possibly for occasional exceedances of the more stringent state regulations pertaining to ambient carbon monoxide concentrations. Congested traffic conditions and possibly sugarcane operations in the project vicinity may cause occasional elevated levels of this air quality parameter.

If the proposed project is given the necessary approvals to proceed, it is inevitable that some short- and long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

After construction, long-term impacts on air quality could potentially occur indirectly as a result of emissions emanating from vehicular traffic coming to and from the development. Access to the project will be accomplished primarily via a roadway that will intersect with Fort Weaver Road and also by a driveway and a service road that will connect with Fort Weaver Road. To assess the impact of emissions from these vehicles, an air quality modeling study was undertaken to estimate current maximum ambient concentrations of carbon monoxide along roadways leading to and

from the project area and to predict future levels of air pollution both with and without the proposed project. Based on the modeling results, present worst-case carbon monoxide concentrations in the project vicinity were estimated to be well within the state and national ambient air quality standards. In the year 1998 without the project, concentrations would likely increase somewhat due to added traffic from other developments in the area; worst-case concentrations would remain within state and national standards, however. With the project in the year 1998 and assuming Fort Weaver Road remains four lanes wide, concentrations within the immediate project area would be substantially higher compared to without it, primarily due to the signalized intersection created by the project. Concentrations would remain within the national standards, however, if the proposed north/south roadway is built. Without the north/south roadway, traffic congestion along Fort Weaver Road may cause occasional exceedances of the national 8-hour standard for carbon monoxide. With or without the north/south roadway, worst-case carbon monoxide concentrations with the project may occasionally exceed the more stringent state standards near the project access road intersection with Fort Weaver Road. Because the state standards are set at such stringent levels, however, it is likely that they are currently exceeded at many locations in the state that have even moderate traffic volumes. Widening of Fort Weaver Road to six lanes, if done in conjunction with an added north/south road, would likely result in lower air pollution concentrations in the project area. Other than the roadway improvements discussed in the traffic study, air quality impacts due to project traffic could perhaps be reduced further by reducing traffic through the promotion of bus service, carpooling and alternate business hours within the development.

Depending on the demand levels, long-term impacts on air quality are also possible due to indirect emissions associated with a development's electrical power and solid waste disposal require-

ments. Quantitative estimates of these potential impacts were not made, but based on the relatively low estimated emission rates involved, any impacts are unlikely. Nevertheless, requiring businesses to incorporate energy conservation design features and promoting conservation and recycling programs within the proposed development could serve to further reduce any impacts.

2.0 INTRODUCTION AND PROJECT DESCRIPTION

The Estate of James Campbell is proposing to develop a neighborhood commercial center on approximately 20 acres of land in the Ewa area on the island of Oahu. The site of the proposed project, referred to as the Laulani Commercial Center, is located along the west side of Fort Weaver Road across from the Hawaii Prince Golf Course. The proposed commercial center is expected to include the typical type and variety of neighborhood commercial establishments, such as a food store, drug store, hair salon, restaurant, automotive parts store, financial institution, or other similar commercial enterprises. Gross leasable commercial space at the center will total approximately 138,000 square feet. In addition to the commercial space provided, approximately 750 parking stalls are included in the project plans. Traffic will enter and exit the project via a project access road connecting with Fort Weaver Road at the Hawaii Prince Golf Course access road and by a driveway and a service road connecting directly with Fort Weaver Road. Construction and full occupancy of the project is expected to be achieved by 1998.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short-term and long-term direct and indirect air quality impacts that could result from construction and use of the proposed facilities as planned.

Measures to mitigate these impacts are suggested where possible and appropriate.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, AAQS have been established for six air pollutants. These regulated air pollutants include: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. National AAQS are stated in terms of primary and secondary standards. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a

maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow one exceedance per year.

State of Hawaii AAQS are in some cases considerably more stringent than comparable national AAQS. In particular, the State of Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit, and the state 1-hour limit for ozone is less than one-half of the federal standard.

Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make the state standards essentially the same as the national limits. In 1993, the state also revised its particulate standards to follow those set by the federal government. It has been proposed in various forums that the state also relax its carbon monoxide standards to the national levels, but at present there are no indications that such a change is being considered.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. On the island of Oahu, the Koolau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, which accounts for much of the variation in the local climatology of the island. The site of the proposed project is located on the broad Ewa Plain leeward of the Koolau Mountains.

The nearest and most representative long-term wind data available for the site are collected at the Barbers Point Naval Air Station located about 3 miles to the west. Data available from the Honolulu International Airport, located about 8 miles to the east, may also be at least semi-representative in some cases. Wind frequency data given in Table 2 for Barbers Point show that the annual prevailing wind direction for this area of Oahu is east northeast (the same as at Honolulu International Airport). On an annual basis, 38.1 percent of the time the wind is from this direction, and more than 80 percent of the time the wind is in the northeast quadrant. Winds from the south are infrequent occurring only a few days during the year and mostly in winter in association with Kona storms. Wind speeds average about 10 knots (12 mph) and mostly vary between about 5 and 15 knots (6 and 17 mph). Surface winds at the project site are very similar to those recorded at Barbers Point.

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from elevated plumes. In Hawaii, the annual and daily variation of temperature depend to a large degree on elevation above sea level, distance inland and exposure to the trade winds.

Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. The project's near coastal, leeward location results in a relatively moderate temperature profile compared to other locations around Oahu and the state. Based on more than 50 years of data collected at Ewa Plantation, average annual daily minimum and maximum temperatures in the project area are 65°F and 84°F, respectively [1]. The extreme minimum temperature on record is 47°F, and the extreme maximum is 93°F.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is oftentimes measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In the Ewa area, stability class 5 or 6 is generally the highest stability class that occurs, developing during clear, calm nighttime or early morning hours when temperature inversions form due to radiational cooling. Stability classes 1 through 4 occur during the daytime, depending mainly on the amount of cloud cover and incoming solar radiation and the onset and extent of the sea breeze.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing

heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights in Hawaii typically are above 3000 feet (1000 meters).

Rainfall can have a beneficial affect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Ewa Plain is one of the driest areas on Oahu due to its leeward and near sea level location. Average annual rainfall amounts to about 21 inches but may vary from about 10 inches during a dry year to more than 40 inches during a wet year [1]. Most of the rainfall usually occurs during the winter months. Monthly rainfall may vary from as little as a trace to as much as 15 inches or more.

5.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from vehicular, industrial, natural and/or agricultural sources. Table 3 presents an air pollutant emission summary by source category for the City and County of Honolulu that was compiled in 1980. These are the latest data that are available. Emissions are undoubtedly higher at this time, but the proportional relationships may continue to be about the same. Also, these emission rates may provide a relative measure with which to assess the proposed project's emissions presented later in this study. As

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suggested in the table, the mineral products industry was the most significant source category for emissions of particulate matter. Sulfur dioxide emissions originated mainly from power plants, while motor vehicles accounted for much of the emissions of nitrogen oxides, carbon monoxide and hydrocarbons.

Fort Weaver Road, which forms the eastern boundary of the project site, is a major arterial roadway that presently carries moderate to heavy levels of vehicle traffic during peak traffic hours. Emissions from motor vehicles using this roadway, primarily nitrogen oxides and carbon monoxide, will tend to be carried over the project site by the prevailing winds.

Several sources of industrial air pollution are located in the Campbell Industrial Park, which is located about 5 miles to the west at Barbers Point. Industries currently operating there include the Chevron and PRI refineries, the AES power plant, H-Power and others. Prevailing winds from the northeast will carry these emissions away from the site most of the time. As indicated in the previous section, winds from the west (which will carry emissions toward the project site) occur only a few percent of the time.

Natural sources of air pollution emissions that also could affect the project area but cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the island of Hawaii.

Air pollution originating from agricultural sources can mainly be attributed to sugar cane operations which until recently dominated land use in the area, including that of the project site. To the

east (upwind of the prevailing wind direction), sugar cane cultivation has mostly been discontinued, which should improve the air quality at the site. Smoke and dust from the remaining cane fields in the area may presently impact the site on occasion, but by the time of project completion in 1998, it is expected that sugar cane growing within the region will have been discontinued entirely due to poor economic conditions.

The State Department of Health operates a network of air quality monitoring stations at various locations on Oahu. Each station, however, typically does not monitor the full complement of air quality parameters. Table 4 shows annual summaries of air quality measurements that were made nearest to the project site for each of the regulated air pollutants for the period 1985 through 1990. These are the most recent data available.

Sulfur dioxide is monitored by the State Department of Health at an air quality station located at Campbell Industrial Park. Monitoring consisted of measurements of 24-hour average sulfur dioxide concentration every sixth day. There were no exceedances of the state/national 24-hour AAQS for sulfur dioxide during the 5-year period. Concentrations monitored were consistently low with daily mean values at or below 5 $\mu g/m^3$.

The closest PM-10 monitoring station is also located at Barbers Point. Twenty-four hour average PM-10 concentrations monitored at this location ranged from 7 to 66 $\mu g/m^3$ between 1986 and 1990. Average daily concentrations were approximately 25 $\mu g/m^3$. All values reported were within the national AAQS.

The nearest carbon monoxide measurements were made at the Department of Health building in downtown Honolulu. During the past 5 years, the average daily maximum 1-hour concentration measured at this location was less than 2 mg/m^3. During the most recent year reported, 1990, the daily maximum 1-hour concentration ranged from 0.1 to 7.1 mg/m^3, and no exceedances of the state 1-hour AAQS were recorded. During previous years (1986-89), maximum 1-hour concentrations were higher, and one to three exceedances of the state 1-hour AAQS were measured each year. Daily maximum 8-hour values for 1988-90 have not been reported at this writing, but concentrations for the 1986-87 period ranged from 0.3 to 4.7 mg/m^3. The average of the daily maximum 8-hour values was about 1.3 mg/m^3. No exceedances of the state 8-hour AAQS were recorded. Present concentrations of carbon monoxide in the project area are estimated later in this study based on air quality modeling of vehicular emissions.

The nearest available ozone measurements were obtained at Sand Island (about 10 miles east of the project site). Except for 1990, the maximum 1-hour concentration each year during the past few years has averaged about 90 $\mu g/m^3$. No exceedances of the state AAQS were recorded between 1986 and 1989. During 1990, a maximum concentration of 116 $\mu g/m^3$ was measured and two exceedances of the state standard were registered.

The closest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1986 and 1987. Lead concentrations at this location had a downward trend for several years, most probably reflecting the increased use of unleaded gasoline. Average quarterly concentrations were near or below the detection limit, and no exceedances of the state AAQS were recorded. Monitoring for this parameter was discontinued during 1988.

Nitrogen dioxide is no longer monitored by the Department of Health anywhere in the state. Concentrations of this pollutant were measured from 1971 through 1976 at Barbers Point, and annual mean values were found to vary from 11 to 29 $\mu g/m^3$, safely inside the state and national AAQS.

Based on the data and discussion presented above, it appears likely that the State of Hawaii AAQS for sulfur dioxide, nitrogen dioxide and lead are currently being met at the project site. It is probable, however, that the state AAQS for ozone may be exceeded on occasion based on the Sand Island measurements for this parameter. Carbon monoxide readings from urban Honolulu indicate that the state AAQS for carbon monoxide may also be exceeded at a rate of one to three times per year in traffic congested areas. Sugar cane operations in the project vicinity likely cause occasional elevated levels of both carbon monoxide and particulate.

6.0 SHORT-TERM IMPACTS OF PROJECT

Short-term direct and indirect impacts on air quality could potentially occur due to project construction. For a project of this nature, there are two potential types of air pollution emissions that could directly result in short-term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts related to slow-moving construction equipment traveling to and from the project site and from a temporary increase in local traffic caused by commuting construction workers.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [2] has provided a rough estimate for *uncontrolled fugitive dust emissions from construction* activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions in the project area would likely be higher because the PE index for the Ewa Plain area is less than 50 due to the relatively dry climate and because the soil silt content in the area is probably greater than 30 percent. In any case, State of Hawaii Air Pollution Control Regulations [3] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in construction areas from becoming significant sources of dust. In dust-prone or dust-sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas is oftentimes a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire

washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Slow-moving construction vehicles traveling on roadways leading to and from the project site could obstruct the normal flow of traffic to such an extent that overall vehicular emissions are increased, but this impact can be mitigated by moving heavy construction equipment during periods of low traffic volume. Likewise, the schedules of commuting construction workers can be adjusted to avoid peak hours in the project vicinity. Thus, most potential short-term air quality impacts from project construction can be mitigated.

7.0 LONG-TERM IMPACTS OF PROJECT

7.1 Roadway Traffic

After construction is completed, use of the proposed facilities will result in increased motor vehicle traffic on nearby roadways, potentially causing long-term impacts on ambient air quality in the

project vicinity. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides, and those burning leaded gasoline contribute lead to the atmosphere. The use of leaded gasoline in new automobiles is now prohibited. As older vehicles continue to disappear from the numbers of those currently operating on the state's roadways, lead emissions are approaching zero. Nationally, so few vehicles now require leaded gasoline that the EPA is proposing a total ban on leaded gasoline to take effect immediately. Even without such a ban, reported quarterly averages of lead in air samples collected in urban Honolulu have been near zero since early 1986. Thus, lead in the atmosphere is not considered to be a problem anywhere in the state.

Federal air pollution control regulations require that new motor vehicles be equipped with emission control devices that reduce emissions significantly compared to a few years ago. In 1990, the President signed into law the Clean Air Act Amendments. This new legislation requires further emission reductions be phased in beginning in 1994. The combination of current and new restrictions on emissions from new motor vehicles will lower average emissions each year as more and more older vehicles leave the state's roadways. Carbon monoxide emissions, for example, will go down by about 15 percent on the average during the next 10 years due to the replacement of older vehicles with newer models.

To evaluate the potential long-term indirect ambient air quality impact of increased roadway traffic associated with a project such as this, computerized emission and atmospheric dispersion models can be used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Carbon monoxide is selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles.

Furthermore, carbon monoxide air pollution is generally considered to be a microscale problem that can be addressed locally to some extent, whereas nitrogen oxides air pollution most often is a regional issue that cannot be addressed by a single new development.

For this project, three scenarios were selected for the carbon monoxide modeling study: (1) year 1993 with present conditions, (2) year 1998 (the expected project completion date) without the project, and (3) year 1998 with the project. The third scenario was examined both with and without the proposed north/south roadway (an alternate to Fort Weaver Road). In all scenarios studied, Fort Weaver Road was assumed to remain four lanes wide. To begin the modeling study, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions associated with traffic queuing. For this study, the two key intersections identified in the traffic study were also selected for air quality analysis. These included the intersection of the project access road with Fort Weaver Road and a project driveway intersection with Fort Weaver Road. The traffic impact assessment report for the project [4] describes the present and future traffic conditions and laneage configurations of these intersections in detail.

The main objective of the modeling study was to estimate maximum 1-hour average carbon monoxide concentrations for each of the four scenarios studied. To evaluate the significance of the estimated concentrations, a comparison of the predicted values for each scenario can be made. Comparison of the estimated values to the national and state AAQS will provide another measure of significance. The traffic impact assessment report indicates that traffic volumes generally are or will be higher during the afternoon peak

hour than during the morning peak period. However, worst-case emission and meteorological dispersion conditions typically occur during the morning hours at most locations. Thus, both morning and afternoon peak-traffic hours were examined to ensure that worst-case concentrations were identified.

The EPA computer model MOBILE5A was used to calculate vehicular carbon monoxide emissions for each year studied. One of the key inputs to MOBILE5A is vehicle mix. Based on recent vehicle registration figures, the present and projected vehicle mix in the project area is estimated to be 91.9% light-duty gasoline-powered vehicles, 5% light-duty gasoline-powered trucks and vans, 0.5% heavy-duty gasoline-powered vehicles, 0.6% light-duty diesel-powered vehicles, 1% heavy-duty diesel-powered trucks and buses, and 1% motorcycles.

Other key inputs to the MOBILE5A emission model are the cold/hot start fractions. Motor vehicles operating in a cold- or hot-start mode emit excess air pollution. Typically, motor vehicles reach stabilized operating temperatures after about 4 miles of driving. For traffic operating within the project area, it was assumed that during both the morning and the afternoon peak-traffic hours about 25 percent of all vehicles would be operating in the cold-start mode and that about 5 percent would be operating in the hot-start mode. These operational mode values were estimated based on a report from the California Department of Transportation [5] and taking into consideration the likely origin of traffic in the project area.

Ambient temperatures of 59 and 68 degrees F were used for morning and afternoon peak-hour emission computations, respectively. These are conservative assumptions since morning/afternoon ambient

temperatures will generally be warmer than this, and emission estimates given by MOBILE5A are inversely proportional to the ambient temperature.

After computing vehicular carbon monoxide emissions through the use of MOBILE5A, these data were then input to the latest version of the computer model CALINE4 [6]. CALINE4 was developed by the California Transportation Department to simulate vehicular movement and atmospheric dispersion of vehicular emissions. The model is designed to predict 1-hour average pollutant concentrations along roadways based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Input peak-hour traffic data were obtained from the traffic study cited previously. Traffic queuing estimates were made based on the project traffic study, Transportation Research Board procedures [7], U.S. EPA guidelines [8], and traffic observations at the subject intersections. Vehicles using Fort Weaver Road were assumed to accelerate to 35 mph, while traffic on the project access road was assumed to move at 25 mph. Deceleration and acceleration times were assumed to be equivalent. A deceleration/acceleration time of 11 seconds was assumed for vehicles traveling at 25 mph while a value of 16 seconds was assumed for those traveling at 35 mph.

Model roadways were set up to reflect roadway geometry, physical dimensions and operating characteristics. Presently, an asphalt walkway exists along the east side of Fort Weaver Road and pedestrians may use the grass shoulder along the west side as well. For the future scenarios, it was assumed that sidewalks would exist along the roadways within the project area. Concentrations predicted by air quality models generally are not considered valid

within the roadway mixing zone. The roadway mixing zone is usually taken to include 3 meters on either side of the traveled portion of the roadway and the turbulent area within 10 meters of a cross street. Model receptor sites were thus located at the edges of the mixing zones near all intersections that were studied. All receptor heights were placed at 1.8 meters above ground to simulate levels within the normal human breathing zone.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs is atmospheric stability category. For these analyses, atmospheric stability category 6 was assumed for morning scenarios and stability category 4 was assumed for afternoon cases. These are the most conservative stability categories that can be used for estimating pollutant dispersion at suburban or undeveloped locations. A surface roughness length of 50 cm was assumed both for the present scenario and for the future cases. A mixing height of 300 meters was used in all cases. Worst-case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentration.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at low to moderate levels. Hence, background contributions of carbon monoxide from sources or distant roadways not directly considered in the analysis were accounted for by adding a background concentration of 1 ppm to all predicted concentrations for both the 1993 and the 1998 scenarios.

Predicted Worst-Case 1-Hour Concentrations

Table 5 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour morning and afternoon

ambient carbon monoxide concentrations. These results can be compared directly to the state and the national AAQS. Estimated worst-case carbon monoxide concentrations are presented in the table for three scenarios: year 1993 with existing traffic, year 1998 without project traffic and year 1998 with project traffic. The 1998 with-project scenario was examined both with and without the proposed north/south roadway. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

As indicated in the table, the estimated present worst-case 1-hour carbon monoxide concentration in the project area, 4.8 mg/m^3, occurred during the morning peak hour near the location of the proposed Fort Weaver Road/project driveway intersection. The afternoon peak-hour value was estimated to be about 20 percent lower at this location. The estimated maximum present 1-hour concentrations in the vicinity of the proposed project access road intersection were at similar levels.

In the year 1998 without the proposed project and without the proposed north/south roadway, the worst-case 1-hour concentration in the project vicinity was predicted to increase to 6.0 mg/m^3. This was predicted to occur during the morning peak-traffic hour near the location of the proposed intersection of Fort Weaver Road and the project driveway. The afternoon worst-case concentration at this location was estimated to reach 5.0 mg/m^3. Maximum estimated concentrations for this scenario near the proposed project access road intersection with Fort Weaver Road were of similar magnitudes.

With the project and without the north/south roadway, predicted 1-hour worst-case concentrations for 1998 increased to 23.5 mg/m^3

near the Fort Weaver Road/project access road intersection. This would occur during the afternoon peak traffic period. The estimated worst-case morning concentration at this location was 19.8 mg/m^3. The significant increase in the estimated concentrations compared to the without project scenario was due to the assumed installation of a traffic signal and to the congested traffic conditions forecast in the project traffic study. Concentrations near the intersection of the project driveway with Fort Weaver Road were predicted to increase only slightly.

With the north/south roadway, morning and afternoon worst-case values in the project vicinity would likely decrease by about 20 percent. Concentrations near the project access road intersection with Fort Weaver Road would be the highest in the immediate project area with estimated maximum morning and afternoon values of 15.3 and 19.6 mg/m^3, respectively.

All estimated worst-case 1-hour carbon monoxide levels for all scenarios are within the national AAQS of 40 mg/m^3. However, future concentrations with the project and either with or without the proposed north/south roadway may exceed the more stringent state 1-hour standard of 10 mg/m^3 on occasion near the project access road intersection with Fort Weaver Road.

Predicted Worst-Case 8-Hour Concentrations

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.5. This accounts for two factors: (1) traffic volumes averaged over eight hours are lower than peak 1-hour values, and (2) meteorological dispersion conditions are more variable (and hence more favorable) over an 8-hour period than they are for a single

hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One recent study based on modeling [9] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [10] recommend using a value of 0.6 to 0.7 unless a locally derived persistence factor is available. Recent monitoring data for Honolulu reported by the Department of Health [11] suggest that this factor may range between about 0.35 and 0.55 depending on location and traffic variability. Considering the location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.5 will likely yield reasonable estimates of worst-case 8-hour concentration.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 6. For the 1993 scenario, the estimated worst-case 8-hour carbon monoxide concentration within the project area was 2.4 mg/m^3. This was estimated to occur near the location of the proposed intersection of Fort Weaver Road and the project driveway. Without the north/south roadway, the predicted maximum values in the area for the year 1998 scenarios were 3.0 mg/m^3 without the project at the location of the proposed project driveway intersection and 11.8 mg/m^3 with the project at the location of the proposed project access road intersection. With the north/south roadway, the with-project worst-case concentration near the proposed access road intersection was estimated to decrease to 9.8 mg/m^3.

Comparing the predicted values for the existing case and the 1998 without project scenario to the AAQS, it appears that both the national and the state 8-hour standards are and would be met in the project vicinity. In 1998 with the project and without the north/south roadway, worst-case 8-hour concentrations could

potentially exceed both state and federal standards near the proposed project access road intersection with Fort Weaver Road. With the north/south roadway, maximum with-project concentrations would likely comply with the national standard but may still exceed the more stringent state limit on occasion.

Conservativeness of Estimates

The results of this study reflect several assumptions that must be made concerning both traffic movement and worst-case meteorological conditions. One such assumption concerning worst-case meteorological conditions is that a wind speed of 1 meter per second with a steady direction for 1 hour will occur. A steady wind of 1 meter per second blowing from a single direction for an hour is not very likely and may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about half the values given above.

7.2 Electrical Demand

The proposed project also will cause indirect air pollution emissions from power generating facilities as a consequence of electrical power usage. The annual electrical demand of the project when fully developed is not expected to exceed about 15 million kilowatt-hours. Electrical power for the project will most probably be provided mainly by oil-fired generating facilities located on Oahu. However, with H-Power and a coal-fired power plant now online at Campbell Industrial Park, some of the project power may well come from sources burning other fuels. In order to meet the electrical power needs of the proposed project, power generating facilities will be required to burn more fuel and hence more air pollution will be emitted at these facilities. Given in Table 7 are estimates of the indirect air pollution emissions that

would result from the project electrical demand assuming all power is provided by burning more fuel oil at Oahu's power plants. If power is supplied instead or in part by coal or solid waste burning facilities, emissions will likely be higher than the values given in the table.

7.3 Solid Waste Disposal

Solid waste generated by the project when fully completed is expected to amount to about 6 tons of refuse per day (about one 6-ton truckload per day). Most project refuse will likely be hauled away and burned at the H-Power facility at Campbell Industrial Park to generate electricity. Burning of the waste to generate electricity will result in emissions of particulate, carbon monoxide and other contaminants, but these will be offset to some extent by reducing the amount of fuel oil that would be required to generate electricity for the project. Table 8 gives emission estimates assuming all project solid waste is burned at H-Power. With the high level of particulate emission control achieved at H-Power, emission quantities from the burning of project solid waste would be relatively small.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the

site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

After the project is completed, long-term air pollution impacts from carbon monoxide emitted by motor vehicle traffic associated with the project will cause relatively significant increases in concentrations near the intersection of the project access road with Fort Weaver Road. Concentrations should remain within the national AAQS, however, if the north/south roadway is built. Without the north/south roadway, congested traffic conditions along Fort Weaver Road could cause exceedances of the national 8-hour standard for carbon monoxide near the project access road. With or without the north/south road, occasional exceedances of the more stringent state standards are likely in the vicinity of the intersection of Fort Weaver Road and the project access road. It should be mentioned, though, that the allowable state carbon monoxide levels are set so low they are probably currently exceeded

at many intersections in the state that have even moderate traffic volumes.

Options available to mitigate long-term, traffic-related air pollution from increased project motor vehicle traffic are to improve roadways, reduce traffic or reduce individual vehicular emissions. Estimates of carbon monoxide concentrations from emissions emanating from vehicular traffic associated with the completed development include the roadway improvements recommended in the traffic study for the project. The estimates do not include any effects from the possible widening of Fort Weaver Road to six lanes. This would likely reduce the predicted maximum concentrations. Aside from improving roadways, air pollution impacts from vehicular emissions could be further mitigated by reducing traffic through the promotion of bus service and car pooling and/or by adjusting business hours to begin and end during off-peak times. While reducing emissions from individual vehicles is also a possible mitigative measure, this is generally beyond the control of a single developer.

Any long-term impacts on air quality due to indirect emissions from supplying the project with electricity and from the disposal of waste materials generated by the project will likely be insignificant based on the relatively small magnitudes of these emissions. Nevertheless, indirect emissions from project electrical demand could likely be reduced somewhat by incorporating energy-saving features into project design requirements. This might include the use of solar water heaters; designing building space so that window positions maximize indoor light without unduly increasing indoor heat; using landscaping where feasible to provide afternoon shade to cut down on the use of air conditioning; installation of insulation and double-glazed doors to reduce the effects of the sun and heat; movable, controlled openings for ventilation at opportune

times; and possibly automated room occupancy sensors. Solid waste related air pollution could likely be reduced somewhat by the promotion of conservation and recycling programs within the proposed development. This could reduce solid waste volumes which would in turn reduce any related air pollution emissions proportionately.

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Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL
AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter[a]	$\mu g/m^3$	Annual	50	50	50
		24 Hours	150[b]	150[b]	150[b]
Sulfur Dioxide	$\mu g/m^3$	Annual	80	-	80
		24 Hours	365[b]	-	365[b]
		3 Hours	-	1300[b]	1300[b]
Nitrogen Dioxide	$\mu g/m^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours	10[b]	-	5[b]
		1 Hour	40[b]	-	10[b]
Ozone	$\mu g/m^3$	1 Hour	235[b]	235[b]	100[b]
Lead	$\mu g/m^3$	Calendar Quarter	1.5	1.5	1.5

[a]Particles less than or equal to 10 microns aerodynamic diameter

[b]Not to be exceeded more than once per year

Table 2

ANNUAL WIND FREQUENCY FOR BARBERS POINT, OAHU (%)

Wind Direction	Wind Speed (knots)						
	0-3	4-6	7-10	11-16	17-21	>21	Total
N	0.1	0.4	0.3	0.1	0.0	0.0	0.9
NNE	0.4	1.5	2.3	1.1	0.2	0.0	5.5
NE	1.2	7.9	5.8	2.6	0.2	0.0	17.8
ENE	2.7	16.2	12.0	7.0	0.2	0.0	38.1
E	0.8	6.2	8.3	4.4	0.1	0.0	19.8
ESE	0.2	0.4	1.2	0.7	0.0	0.0	2.5
SE	0.0	0.3	1.2	1.3	0.0	0.0	2.9
SSE	0.0	0.3	1.1	1.0	0.1	0.0	2.5
S	0.1	0.6	1.5	0.7	0.2	0.0	3.1
SSW	0.1	0.3	0.8	0.3	0.0	0.0	1.5
SW	0.0	0.2	0.5	0.3	0.0	0.0	1.1
WSW	0.0	0.1	0.5	0.3	0.0	0.0	1.0
W	0.1	0.2	0.5	0.4	0.0	0.0	1.2
WNW	0.0	0.1	0.4	0.4	0.0	0.0	0.9
NW	0.0	0.1	0.2	0.2	0.0	0.0	0.5
NNW	0.0	0.2	0.1	0.0	0.0	0.0	0.3
CALM	0.4						0.4
TOTAL	6.1	35.0	36.8	20.8	1.2	0.1	100.0

Source: "Monthly and Annual Wind Distribution/Pasquill Stability Classes, STAR Program, Barbers Point Hawaii, 1/72-12/76, 8 Observations/Day" , U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service, National Climatic Center, Asheville, NC.

Table 3

AIR POLLUTION EMISSIONS INVENTORY FOR
CITY AND COUNTY OF HONOLULU, 1980

Source Category	Emissions (tons/year)				
	Particulate	Sulfur Oxides	Nitrogen Oxides	Carbon Monoxide	Hydrocarbons
Steam Electric Power Plants	2,092	36,736	12,455	1,065	184
Gas Utilities	14	0	199	0	0
Fuel Combustion in Agricultural Industry	1,088	579	358	0	31
Refinery Industry	622	7,096	2,149	266	2,584
Petroleum Storage	0	0	0	0	1,261
Metallurgical Industries	28	96	40	0	0
Mineral Products Industry	6,884	1,883	597	0	31
Municipal Incineration	42	145	2,029	0	184
Motor Vehicles	1,413	1,014	17,270	239,198	22,853
Construction, Farm and Industrial Vehicles	184	193	2,507	3,729	338
Aircraft	382	145	1,751	5,594	1,476
Vessels	42	386	438	533	123
Agricultural Field Burning	1,399	0	0	15,982	1,692
Total:	14,190	48,273	39,793	266,367	30,757

Source: State of Hawaii, Department of Health

Table 4

ANNUAL SUMMARIES OF AIR QUALITY MEASUREMENTS FOR
MONITORING STATIONS NEAREST LAULANI COMMERCIAL PROJECT

Parameter / Location	1986	1987	1988	1989	1990
Sulfur Dioxide / Barbers Point					
No. of 24-Hr Samples	57	53	60	54	57
Range of 24-Hr Values (µg/m3)	<5-10	<5-13	<5-19	<5-20	<5-<5
Average Daily Value (µg/m3)	<5	5	<5	<5	<5
No. of State AAQS Exceedances	0	0	0	0	0
PM-10 / Barbers Point					
No. of 24-Hr Samples	52	46	56	58	60
Range of 24-Hr Values (µg/m3)	7-66	10-40	10-48	10-44	12-60
Average Daily Value (µg/m3)	26	21	24	26	28
No. of State AAQS Exceedances	NA	NA	NA	NA	NA
Carbon Monoxide / Downtown Honolulu					
No. of Days of 1-Hr Samples	348	345	360	323	362
Range of Daily Max. 1-Hr Values (mg/m3)	0.2-13.5	0.3-11.1	0.2-10.4	0.3-7.8	0.1-7.1
Avg. Daily Maximum 1-Hr Value (mg/m3)	2.2	1.7	1.7	1.9	1.5
No. of State 1-Hr AAQS Exceedances	3	1	1	0	0
No. of Days of 8-Hr Samples	213	228	-	-	-
Range of Daily Max. 8-Hr Values (mg/m3)	0.3-4.7	0.3-3.9	-	-	-
Avg. Daily Maximum 8-Hr Value (mg/m3)	1.4	1.2	-	-	-
No. of State 8-Hr AAQS Exceedances	0	0	-	-	-
Ozone / Sand Island					
No. of Days of 1-Hr Samples	346	342	362	342	340
Range of Daily Max. 1-Hr Values (µg/m3)	10-88	4-84	0-94	0-96	4-116
Avg. Daily Maximum 1-hr Value (µg/m3)	39	38	13	15	36
No. of State AAQS Exceedances	0	0	0	0	2
Lead / Downtown Honolulu					
No. of 24-Hr Samples	57	57	-	-	-
Range of 24-Hr Values (µg/m3)	0.0-0.2	0.0-0.2	-	-	-
Average Quarterly Value (µg/m3)	0.0	0.0	-	-	-
No. of State AAQS Exceedances	0	0	-	-	-

Source: State of Hawaii Department of Health

Table 5

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR LAULANI COMMERCIAL CENTER PROJECT (milligrams per cubic meter)

Roadway Intersection	Year/Scenario[a] 1993/ Present AM	PM	1998/ Without Project AM	PM	1998/ With Project AM	PM
Without North/South Road:						
Ft. Weaver Road at Project Access Road	4.6	3.7	5.5	5.1	19.8	23.5
Ft. Weaver Road at Project Driveway	4.8[b]	3.7[b]	6.0	5.0	6.1	5.9
With North/South Road:						
Ft. Weaver Road at Project Access Road	-	-	-	-	15.3	19.6
Ft. Weaver Road at Project Driveway	-	-	-	-	4.7	4.6

Hawaii State AAQS: 10
National AAQS: 40

[a]1998 with project scenario assumes a signalized four-leg intersection will exist along Ft. Weaver Road at the proposed project access road (with or without the north/south road).

[b]Assumes through traffic only.

Table 6

ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR LAULANI COMMERCIAL CENTER PROJECT (milligrams per cubic meter)

Roadway Intersection	Year/Scenario[a] 1993/ Present	1998/ Without Project	1998/ With Project
Without North/South Road:			
Ft. Weaver Road at Project Access Road	2.3	2.7	11.8
Ft. Weaver Road at Project Driveway	2.4[b]	3.0	3.0
With North/South Road:			
Ft. Weaver Road at Project Access Road	-	-	9.8
Ft. Weaver Road at Project Driveway	-	-	2.4

Hawaii State AAQS: 5
National AAQS: 10

[a]1998 with project scenario assumes a signalized four-leg intersection will exist along Ft. Weaver Road at the proposed project access road (with or without the north/south road).

[b]Assumes through traffic only.

Table 7

ESTIMATED INDIRECT AIR POLLUTION EMISSIONS FROM LAULANI COMMERCIAL CENTER PROJECT ELECTRICAL DEMAND[a]

Air Pollutant	Emission Rate (tons/year)
Particulate	4
Sulfur Dioxide	40
Carbon Monoxide	3
Volatile Organics	<<1
Nitrogen Oxides	15

[a]Based on U.S. EPA emission factors for utility boilers [2]. Assumes electrical demand of 15 million kw-hrs per year and low-sulfur oil used to generate power.

Table 8

ESTIMATED INDIRECT AIR POLLUTION EMISSIONS FROM LAULANI COMMERCIAL CENTER PROJECT SOLID WASTE DISPOSAL DEMAND[a]

Air Pollutant	Emission Rate (tons/year)
Particulate	<1
Lead	<<1
Sulfur Dioxide	2
Carbon Monoxide	3
Volatile Organics	<<1
Nitrogen Oxides	4

[a]Based on U.S. EPA emission factors for municipal waste incinerators [2]. Assumes mass burn unit with 99 percent control of particulate emissions and solid waste disposal demand of 6 tons per day.

APPENDIX E

Preliminary Engineering Report
Engineering Concepts, Inc.

APPENDIX E

Preliminary Engineering Report
Engineering Concepts, Inc.

PRELIMINARY ENGINEERING REPORT
FOR THE
PROPOSED LAULANI COMMERCIAL DEVELOPMENT
EWA, OAHU, HAWAII

Prepared By:

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December 1993

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PROPOSED LAULANI COMMERCIAL DEVELOPMENT

Executive Summary

The proposed Laulani commercial development will encompass approximately 20 acres along Fort Weaver Road, adjacent to Ewa By Gentry - West, Ewa Marina, and the Hawaii Prince Golf Course. The commercial project is part of the greater Laulani development.

Grading and Soil Erosion

The proposed development will result in construction activities including, clearing and grubbing, and grading.

The soil erosion potential for the project site was estimated to be 34 tons per year under existing conditions and 0.38 tons per year after development (a decrease of over 99 percent). Short-term soil erosion potential during a 12-month construction period is estimated to be 198 tons. Reduction of this short-term soil erosion potential by 43 percent to 113 tons may be achieved by implementing mitigative measures.

Roads

Vehicular access to the project will be via Fort Weaver Road and a future roadway to serve the overall Laulani development.

Drainage

The 20-acre project site and surrounding Laulani development are part of the Kaloi Gulch watershed. Under existing conditions, runoff rates from the project site of 18 cfs, 24 cfs and 26 cfs were calculated for 10-year, 50-year and 100-year intensity storms, respectively with rainfall durations of one hour.

Runoff from the project site is intended to ultimately flow to an improved Kaloi Gulch via a system of inlets, drain pipes and outlet structures. The Kaloi Gulch improvements will be designed to accommodate the peak runoff from the watershed, and will be implemented as part of the overall Laulani development. In the interim, runoff is planned to be collected and discharged into temporary retention/detention basins, minimizing the impact to downstream properties. The rate of runoff from the project site and drainage basin will increase after development due to the increase in impervious surfaces. For the project site, runoff rate for developed conditions amount to 80 cfs (10-year), 106 cfs (50-year) and 115 cfs (100-year).

Water Facilities

It is anticipated that the present potable water system serving the adjacent developments will be extended to serve the proposed commercial development.

Water use with an all potable water system is estimated to be 60,000 GPD (average day demand). A dual water system will be implemented if sources of nonpotable water are available. Average day demands under a dual water system scenario are 43,200 gpd potable water and 28,800 gpd nonpotable water.

Wastewater Facilities

The proposed project is expected to tie into the existing municipal wastewater collection system for conveyance of wastewater to the Honouliuli Wastewater treatment plant. Depending on the final elevations of the project, a private lift station may be necessary to convey wastewater to an existing sewer main in Geiger Road north of the project site.

Solid Waste

Refuse generated from the project site will include construction wastes in the short term and commercial/domestic wastes in the long term. These wastes

are not expected to have significant impact on the leeward Oahu solid waste disposal facilities. Refuse collection will be handle by private collection companies.

Power and Communications

It is anticipated that Hawaiian Electric Company and Hawaiian Telephone Company will provide electrical and telephone service to the proposed development. Existing electrical and telephone lines will be extended to provide service to the site.

Preliminary Cost Estimate

Onsite and offsite improvements are estimated to be $6,500,000 and $3,000,000, respectively.

PRELIMINARY ENGINEERING REPORT
FOR THE
PROPOSED LAULANI COMMERCIAL DEVELOPMENT

INTRODUCTION

The Estate of James Campbell is proposing a new commercial development in Ewa. The project site, encompassing approximately 20 acres, is within the parcel known as Laulani and is located along Fort Weaver Road below the existing Ewa by Gentry - West development *(see Figure 1)*. *The Hawaii* Prince Golf Course is located across Fort Weaver Road to the east, the proposed Ewa Marina development is located to the south, and Barbers Point Naval Air Station to the west.

The project is part of the Estate's overall master plan and will be providing commercial services for the growing community in the Ewa area. Currently, commercial services for the Ewa and Ewa Beach areas are limited to the Ewa Beach Shopping Center and adjacent business community. With the rapidly growing Ewa population, additional commercial services will be needed.

This report identifies preliminary engineering information pertaining to infrastructure requirements for the proposed commercial development. Specifically, this report will address--

1. Background information on the proposed project;
2. Existing conditions;
3. Modifications after development; and
4. Impacts and mitigation of the proposed development.

PROJECT BACKGROUND

The proposed twenty acre commercial site is planned to be developed as a low density community shopping center with approximately 138,000 square feet of leaseable space. Two major tenants, along with smaller retail stores and fast food/restaurant tenants, are expected to be established in the center.

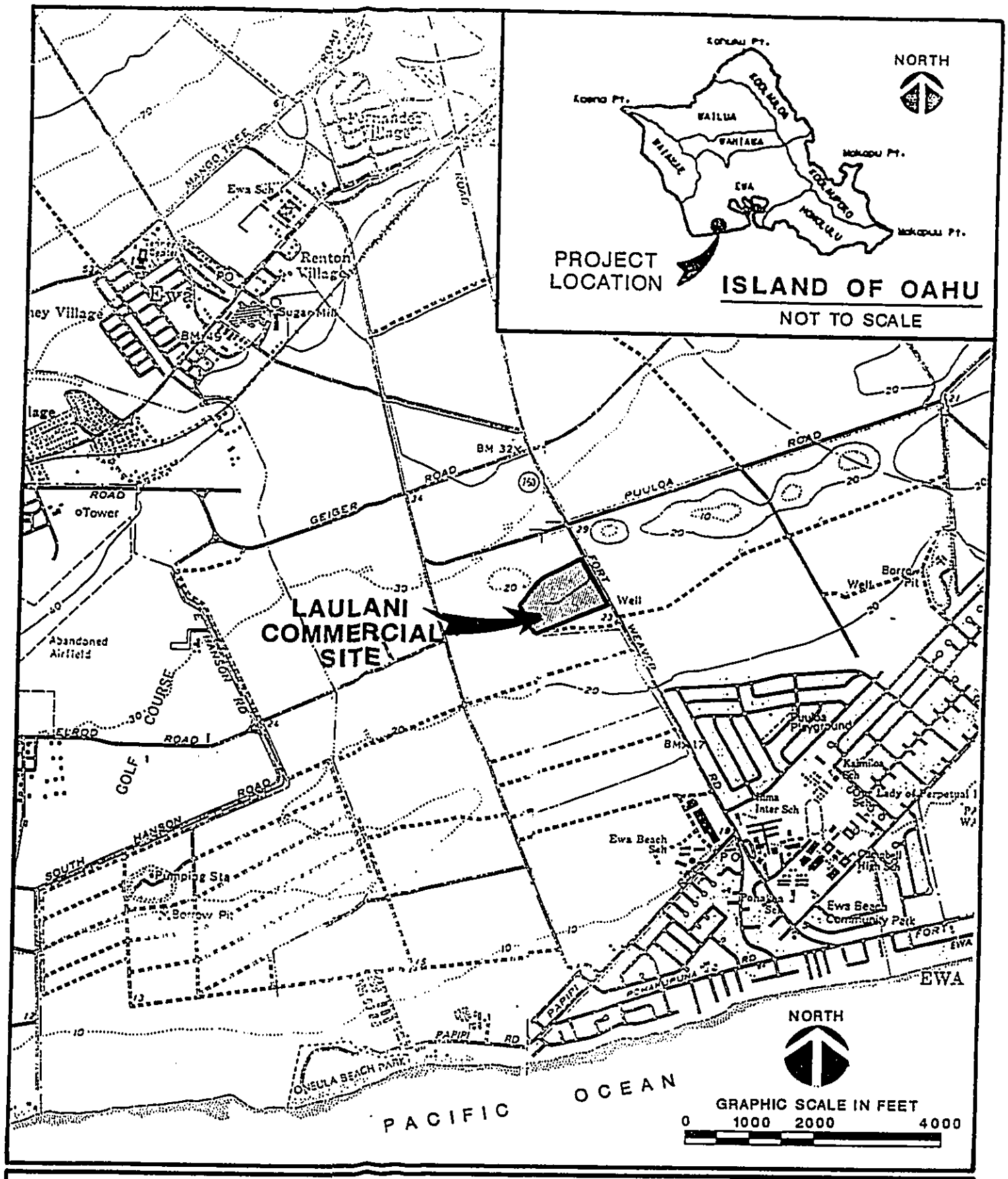

figure 1	LOCATION MAP	LAULANI COMMERCIAL SITE EWA, OAHU, HAWAII
	DECEMBER 1993	ENGINEERING CONCEPTS, INC. HONOLULU, HAWAII

The main access to the site will be from the proposed roadway serving as the major access to the overall Laulani development. The roadway will connect to Fort Weaver Road at the intersection of the existing entrance to the Hawaii Prince Golf Course. Two additional driveways having right in/right out movements may be requested from the State Department of Transportation Highways Division to facilitate traffic circulation.

Land Use And Zoning

The project area is currently designated an Agricultural District by the State. An application to change the land use designation to Urban will be made to the State Land Use Commission.

The project area is currently zoned AG-2, General Agricultural District by the City. An application for rezoning will be submitted to the City's Department of Land Utilization for reclassification to B-2, Community Business District.

Existing Uses

The project area is leased to Oahu Sugar Company, and is currently used for sugar cane cultivation.

Climate

The climate in the area of the project site is warm and dry, typical of the climate found in the Ewa Plains. Tradewinds from the northeast occur much of the time, with occasional Kona winds.

The normal temperature range for the area is from the high 60s (Fahrenheit) to the low 90s. Rainfall is light, with an average annual rainfall of approximately 20 inches.

Topographic Features

The natural topography of the project site is flat, with scattered mounds and depressions. Natural elevations range from a high of approximately 26 feet mean

sea level (MSL) at the northern corner of the site to approximately 23 feet MSL at the southern corner (Figure 2). Natural slopes range from flat to 5 percent, with an average slope across the site of about 0.2 percent in the north-south direction. The topographic features of the commercial site is characteristic of the overall Laulani area.

Soils

The soil found within the project area is classified by the U.S. Department of Agriculture Soil Conservation Service as Mamala stony silty clay loam, 0 to 12 percent slopes (MnC), and Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes (EmA). These soils are typical of the soils found in the low lying areas cultivated in sugar cane. Refer to Figure 3 for identification of soil types in the vicinity of the project site.

GRADING AND SOIL EROSION

Grading

Due to flat nature of the site, the proposed development will likely require embankment over the 20 acres. It is anticipated that fill, ranging in depths of 2 to 5 feet, will be needed to facilitate drainage of the site.

Calculation of Soil Erosion Potential

The U.S. Department of Agriculture, Soil Conservation Service utilizes the Universal Soil Loss Equation (USLE) to estimate long term average annual soil losses from sheet and rill erosion. The equation is used to estimate erosion on forest land, farm fields, construction/development sites, and other areas. Soil losses can be estimated for present conditions or for a future condition. The soil loss equation considers rainfall, soil erodibility, ground cover and management, ground slope and length of overland flow.

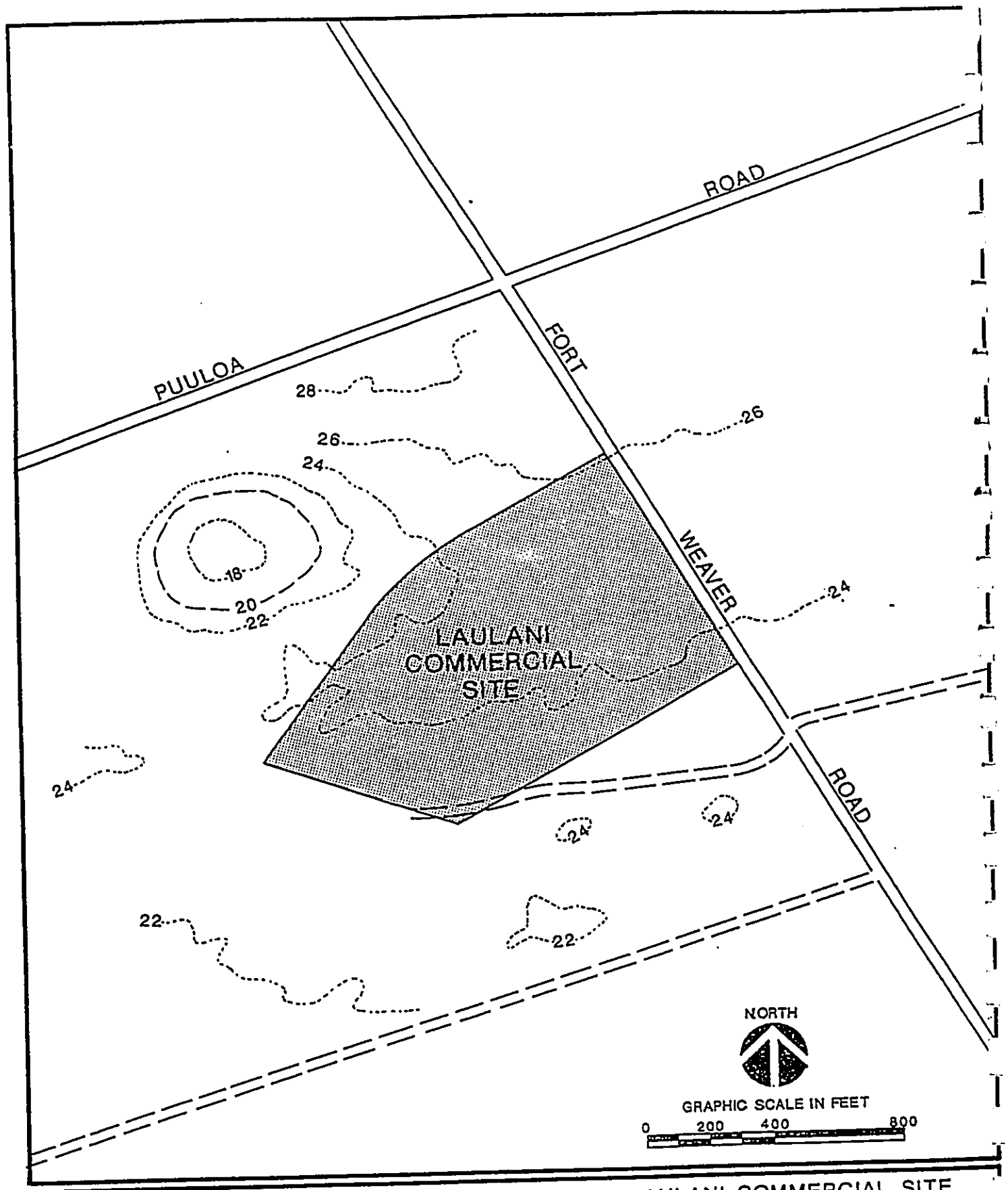

figure 2 **TOPOGRAPHIC MAP**

LAULANI COMMERCIAL SITE
EWA, OAHU, HAWAII

ENGINEERING CONCEPTS, INC.
HONOLULU, HAWAII

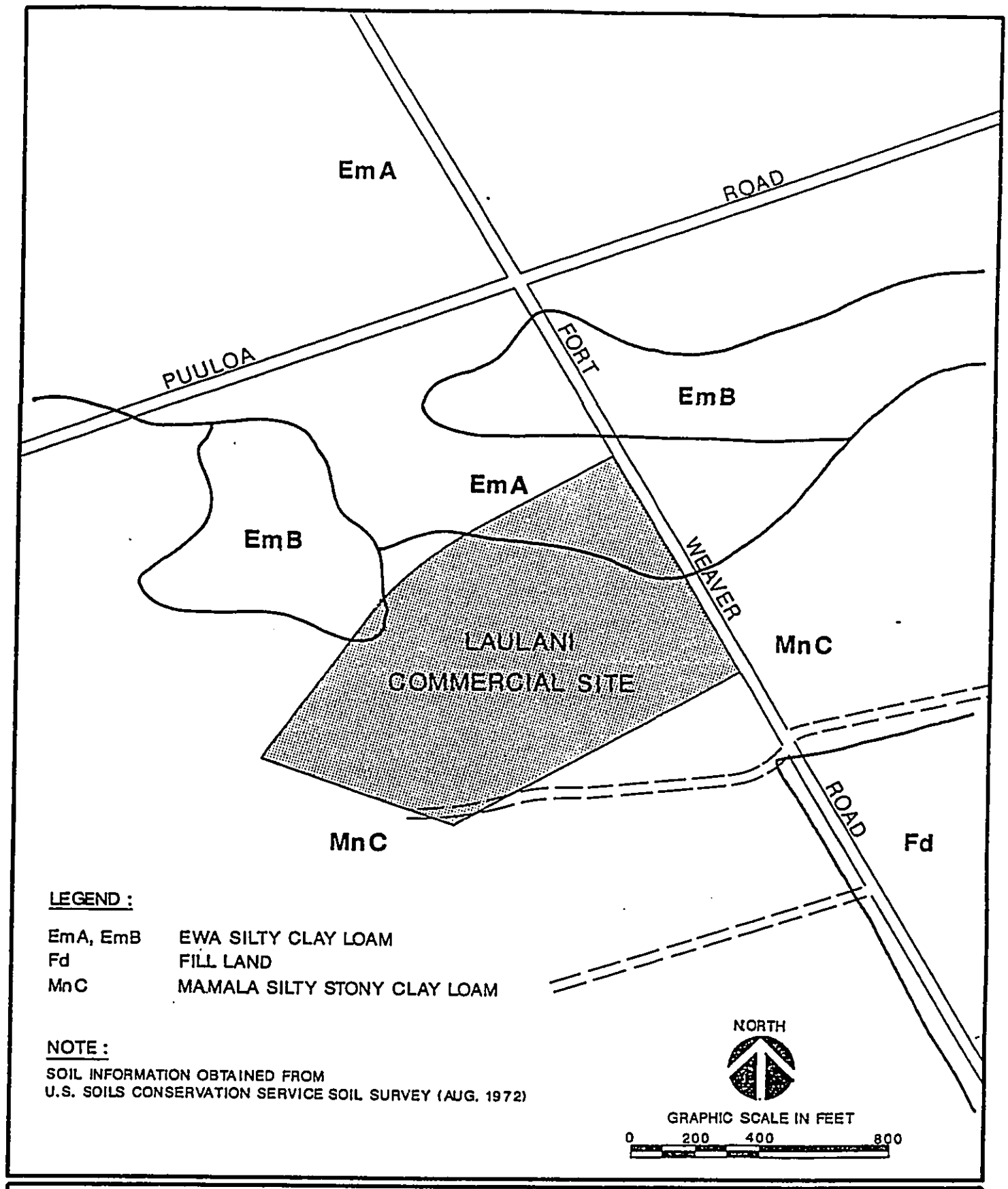

figure 3 **SOILS MAP**

LAULANI COMMERCIAL SITE
EWA, OAHU, HAWAII

ENGINEERING CONCEPTS, INC.
HONOLULU, HAWAII

The existing soil erosion potential for the 20-acre project site is estimated to be 34 tons per year using the USLE. After development, the soil erosion potential from the site is estimated to be 0.38 tons per year.

Impacts and Mitigation

Based on the USLE, long-term soil erosion potential at the project site should decrease substantially after development. This decrease in soil erosion is attributed to the reduction of erodible surfaces (increase in buildings and pavement). The estimated long-term reduction in soil erosion potential is over 33 tons per year, or over 99 percent after development.

Construction of the proposed commercial facilities will involve land disturbing activities that result in soil erosion. These land disturbing activities include clearing, leveling, removing and replacing soil. Short-term soil erosion potential during construction is estimated by the USLE at 198 tons for grading over a one year period. Implementation of mitigative measures will reduce short-term soil erosion. For example, limiting grading to not more than 15 consecutive acres at a time; installation of a 10,000 sq. ft. siltation basin at the onset of construction; and use of a combination of structural controls such as filter inlets and berms, sediment traps, chutes and flumes, containment dikes, or other suitable practices will reduce the estimated erosion potential for the project site by 43 percent to 113 tons.

Implementing other erosion control measures will further lessen the short-term soil erosion impacts during construction. These measures include: minimizing construction time; use of temporary sprinklers in nonactive construction areas; stationing water trucks onsite during construction to provide immediate sprinkling in active construction zones; use of temporary berms and cut-off ditches; thorough watering of graded areas after construction activity has ceased for the day and on weekends; sodding or planting slopes immediately after grading work has been completed.

Grading and Erosion Control Plans will be prepared in compliance with Chapter 23, Revised Ordinances of Honolulu.

ROADS

Existing Conditions

The project site is currently accessed from Fort Weaver Road, a four-lane roadway which serves as the main collector for the Ewa/Ewa Beach area.

Impacts and Mitigation

It is anticipated that the proposed project will generate increased vehicular traffic along Fort Weaver Road. The Estate of James Campbell is a member of a working group currently studying the traffic impacts and requirements of development in the Ewa area. The Ewa Regional Transportation Study has been reviewed and approved by the State Department of Transportation and includes several recommended improvements. The recommended improvements included the construction of the north-south collector road and new interchange at H-1, the east-west Kapolei Parkway collector, Kunia Interchange improvements, and other miscellaneous roadway improvements. The Estate has agreed to contribute their prorata share for the cost of these improvements. Implementation of the recommended roadway improvements will help ease traffic congestion in the area.

A new local roadway serving the project site and the remaining Laulani development will be constructed to facilitate the projects requirements. Traffic signals and other improvements to the existing Fort Weaver Road in the vicinity of the projects site are also planned.

DRAINAGE

Existing Conditions

The project area is part of the Kaloi Gulch watershed area that extends from crest of the Waianae mountain range to the shoreline, encompassing approximately 11 square miles. Proposed development areas within the watershed include:

Campbell Estate lands; the State property; the City and County of Honolulu Department of Housing and Community Development's (HCD) Ewa Villages; the Laulani project; Ewa by Gentry; and Ewa Marina by Haseko.

Between the freeway and Mango Tree Road, Kaloi Gulch is generally a narrow, shallow, unlined ditch with limited capacity. Runoff from larger storms typically overtops the banks and spills into the adjacent cane fields. Additional restrictions are imposed at haul road crossings where culverts allow only minimal flows to pass through without overtopping the channel. From a short distance above Mango Tree Road to its makai terminus, the Kaloi Gulch channel is man-made and consists of two levees built above existing ground. The channel invert is at or above the adjacent ground. The capacity of the channel through this section is very limited and unable to accommodate large runoff under existing conditions.

Coordination of permanent and temporary improvements is continuing among the developers in the watershed. Temporary improvements will be required for the developments due to the varying stages of development for each project.

There are no existing drainage improvements within the project site. Runoff generated on the site and from the surrounding Laulani drainage basin (Figure 4) flows overland towards existing depressions or in a southerly direction.

Runoff from the 20-acre project site were estimated for the 10-, 50-, and 100-year storms under existing conditions by the Rational Method. One-hour rainfall intensities used in the analysis were 1.75 inches per hour for the 10-year storm, 2.3 inches per hour for the 50-year storm, and 2.5 inches per hour for the 100-year storm. Refer to Table 1 for a summary of the calculations.

Flood Hazard

The project site is designated Zone D by the Flood Insurance Rate Map (FIRM), indicating areas in which flood hazards are undetermined (Figure 5).

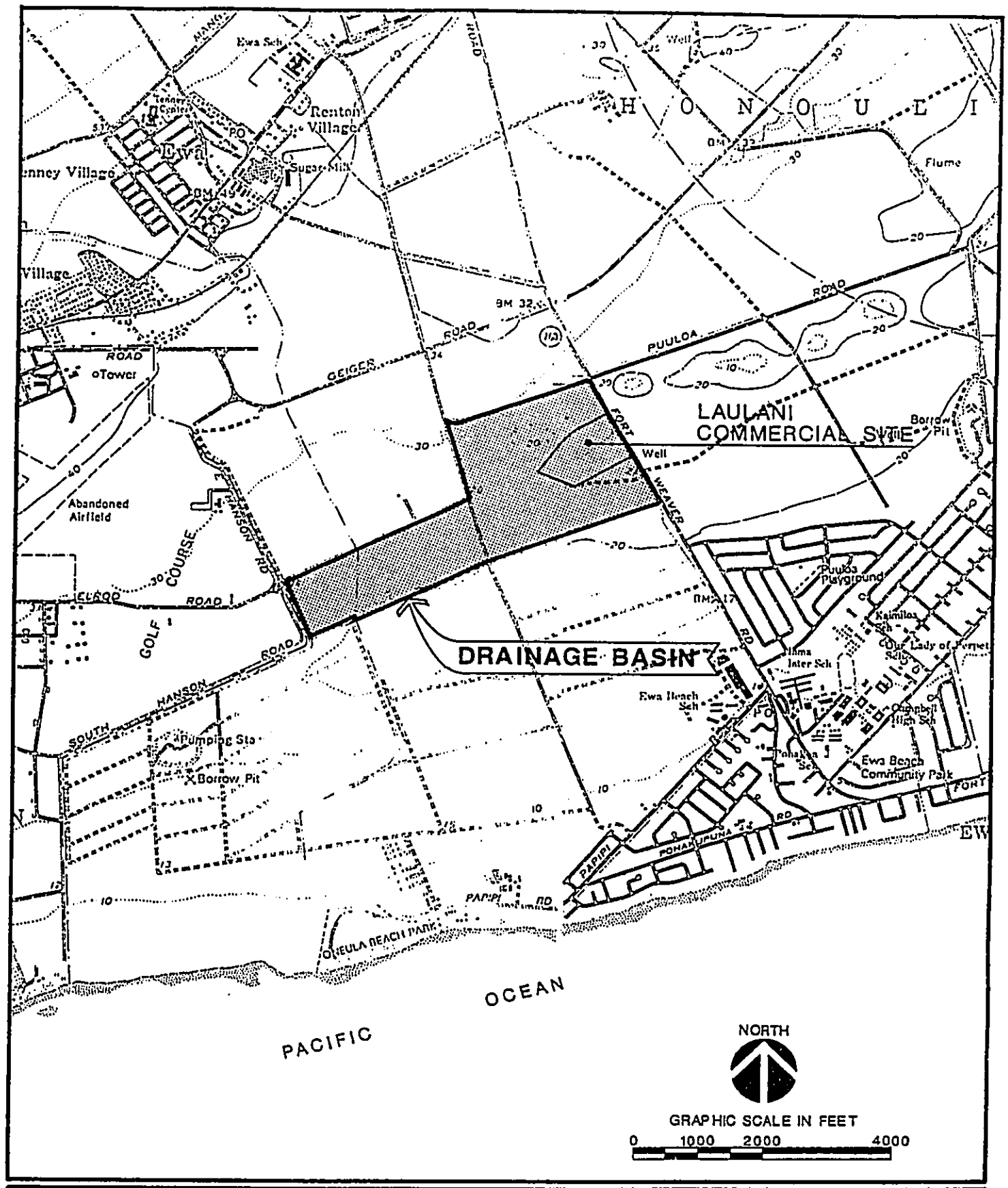

figure 4 **DRAINAGE BASIN**

LAULANI COMMERCIAL SITE
EWA, OAHU, HAWAII

ENGINEERING CONCEPTS, INC.
HONOLULU, HAWAII

TABLE 1

RUNOFF BEFORE AND AFTER DEVELOPMENT

Project Site	Existing Conditions (cfs)	Developed Conditions (cfs)	Percent Increase
10-yr	18	80	344
50-yr	24	106	342
100-yr	26	115	342

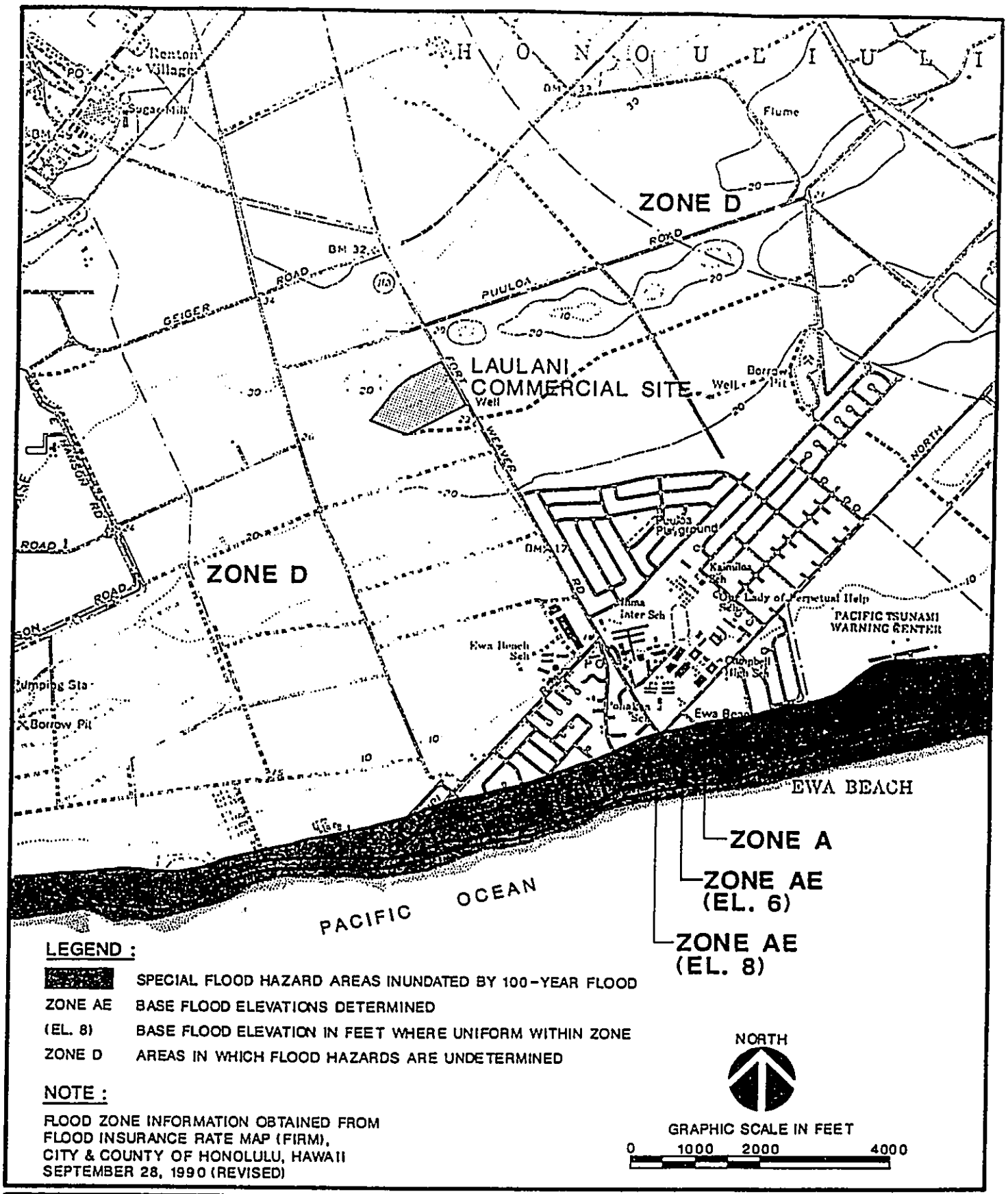

figure 5 **FLOOD MAP**

LAULANI COMMERCIAL SITE
EWA, OAHU, HAWAII

ENGINEERING CONCEPTS, INC.
HONOLULU, HAWAII

Modifications After Development

It is anticipated that storm runoff from the proposed development will ultimately flow to a storm drain collection system of inlets, piping and outlet structures that discharge into an improved Kaloi Gulch.

Runoff rates for developed conditions were estimated for the 10-, 50- and 100-year storms with a duration of one hour (Table 1).

Impacts and Mitigation

The proposed commercial development will alter the character of the project site. The sugar cane fields will be replaced by paved areas, buildings, and other commercial facilities. Consequently, the rate of runoff generated onsite and from the entire drainage basin will increase. Refer to Table 1 for a summary of the percent increase in runoff before and after development.

Runoff from the project site is intended to ultimately flow to an improved Kaloi Gulch via a system of inlets, drain pipes and outlet structures. The Kaloi Gulch improvements will be designed to accommodate the peak runoff from the watershed, and will be implemented as part of the overall Laulani development. In the interim, runoff is planned to be collected and discharged into temporary retention/detention basins, minimizing the impact to downstream properties. The drainage system for the commercial site will be planned and designed in coordination with the overall Laulani development to facilitate connection to the permanent system in the future.

WATER FACILITIES

Existing Conditions

The project site is currently undeveloped, with no onsite potable water facilities.

Potable water for the adjacent developments is presently provided by the Board of Water Supply (BWS) system via 8-, 16- and 36-inch mains in Fort Weaver Road. The water source is found near Waipahu in the vicinity of the Kunia

Interchange. The Hoaeae Wells, Kunia Wells I and II, and the Waipahu Wells feed the water system serving the Ewa/Kapolei area. The Ewa Plains Water Development Corporation, of which the Estate is a member, has developed water system infrastructure to serve the needs of the developments in the area.

Modifications After Development

It is anticipated that the present potable water system serving the area will be used to serve the project site. If available, nonpotable water would be used for landscape irrigation. The potable water demand for the project site can be estimated by the acreage of the development and a water use factor. A factor of 3,000 gallons per acre per day (gpad) is used to calculate the water allocation for an all potable water system. If a dual water system is implemented, the potable demand factor would be 2,160 gpad, with a nonpotable demand factor of 1,440 gpad.

Based on the 20 acre project site, estimated water demands are 60,000 gallons per day (gpd) for an all potable system; and 43,200 gpd potable water and 28,800 gpd nonpotable water for a dual system.

The water system for the Laulani development is planned to be installed in the future roadway. It is anticipated that the Laulani system would connect to the existing 36-inch line in Fort Weaver Road. Water and fire protection service for the commercial development would tap into the line in the future road.

Impacts and Mitigation

Development of the project will increase the demand for both potable and nonpotable water in the area. As a member of the Ewa Plains Water Development Corporation, the Estate would have a prorata share of necessary improvements.

The proposed potable water system in the future road will be designed in accordance with the BWS Water System Standards and is anticipated to be dedicated to the BWS for operation and maintenance. A water master plan for the Laulani development, including the project site, will be prepared and submitted to

BWS for their review and approval. Short term impacts due to the proposed water system will be construction related and may include dust, noise and traffic disturbances along Fort Weaver Road. Mitigation of these potential short term impacts can be achieved by limiting construction to off-peak traffic hours, use of wind breaks or watering to reduce dust, implementation of approved traffic control plans, and compliance with applicable Administrative Rules of the State Department of Health, Title 11: Chapter 42 (Vehicular Noise Control for Oahu), Chapter 43 (Community Noise Control for Oahu), and Chapter 60 (Air Pollution Control).

WASTEWATER FACILITIES

Existing Conditions

The project site is presently undeveloped, with no existing wastewater facilities onsite.

The nearest municipal treatment facility, the Honouliuli Wastewater Treatment Plant (WWTP) is located approximately one mile west of the project site. An existing 30-inch force main located within Fort Weaver Road conveys wastewater from the Ewa Beach area to an existing 84-inch gravity sewer in Geiger Road to the north. The 84-inch sewer line is the main line to the WWTP.

Modifications After Development

Wastewater generated from the project is expected to be of typical domestic composition. The average design flow is estimated to be about 60,000 gallons per day (GPD) based on an equivalent population of about 40 capita per acre and a average wastewater generation rate of 80 gallons per capita per day.

The proposed wastewater system will include a collection of pipes and manholes conveying wastewater to the existing 84-inch line in Geiger Road. Based on the final elevations of the project and the surrounding Laulani development, a private lift station may be implemented onsite to pump the project's wastewater to the sewer main in Geiger Road.

Impacts and Mitigation

Wastewater impacts related to the proposed development are expected to be short-term in nature. Short term impacts are related to the construction of the proposed sewer improvements. Construction impacts can be minimized by implementing an approved traffic control plan, limiting construction to off-peak traffic hours and coordination of construction with any other improvements planned for Farrington Highway. Other mitigative measures to minimize potential noise and dust generation are compliance with applicable Administrative Rules of the State Department of Health, Title 11: Chapter 42 (Vehicular Noise Control for Oahu), Chapter 43 (Community Noise Control for Oahu), and Chapter 60 (Air Pollution Control).

Under existing conditions, the additional 0.06 MGD average wastewater flow from the project site should not have a significant affect on the capacity of the Honouliuli WWTP, especially since the capacity of the plant has been expanded. The application for sewer connection will still need to be filed with and reviewed by DWM. Wastewater requirements will continue to be coordinated with DWM. The wastewater collection system for the project will also be coordinated with the requirements for the overall Laulani development to facilitate future interconnection.

SOLID WASTE

Existing Conditions

The project site is presently undeveloped and does not generate solid wastes.

Modifications After Development

The project site will generate solid waste during construction and after development. Construction wastes will consist primarily of vegetation, rocks, and debris resulting from clearing the site prior to construction.

Solid wastes generated by the commercial development is expected to be of typical commercial/domestic composition.

Impacts and Mitigation

The proposed development will be a new generator of solid waste. Generation of construction wastes due to clearing of the site will be a short term impact. The contractor will be required to remove all debris from the project site to mitigate the environmental impact. After development, refuse from the proposed commercial area will be serviced by a private refuse collection company.

The City and County currently operates a landfill site in Waimanalo Gulch and the H-Power waste energy recovery facility on the leeward side of Oahu. Refuse from the project site is not expected to have a significant impact on the leeward Oahu solid waste disposal facilities.

POWER AND COMMUNICATIONS

Existing Conditions

Hawaiian Electric Company (HECO) and GTE Hawaiian Telephone Company provide electrical and telephone service to the adjacent developments.

Modifications After Development

It is anticipated that existing electrical and telephone lines will be extended along the future roadway to the project site to provide service for the proposed commercial development.

Impacts and Mitigation

The proposed commercial development will place additional demands on the utility systems. It is estimated that electrical demands for this project will be approximately 15,400,000 kwh/year. Mitigation of potential impacts to the HECO system due to development in the Ewa/Kapolei area are under consideration in the

planning of new facilities. Plans for future expansion of the Kahe Power Plant to increase power generation capabilities have been indicated by HECO.

PRELIMINARY COST ESTIMATE

The preliminary cost estimate for the project site improvements are estimated to be approximately $6,500,000, including earthwork. Offsite improvements are estimated to cost approximately $3,000,000, and includes a temporary wastewater pump station, force main, offsite access/road improvements, and temporary drainage improvements.

APPENDIX F

Traffic Impact Assessment Report
Pacific Planning & Engineering

TRAFFIC IMPACT ASSESSMENT REPORT

FOR

LAULANI 20 - ACRE COMMERCIAL SITE

December 13, 1993

Ewa, Oahu, Hawaii
TMK 9-1-12:30

Prepared for:

William E. Wanket, Inc.

Prepared By:

Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

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FOREWORD

The traffic forecasts shown within this report's figures and tables are the direct result of Pacific Planning & Engineering, Inc.'s proprietary computer modeling and analytical tools. For report editing and review purposes, the forecast values have been rounded, although we do not imply this level of accuracy can exist in any forecast method. These values, however, reasonably quantify the forecasted traffic volumes for the purposes of this study.

EXECUTIVE SUMMARY

Pacific Planning & Engineering, Inc. (PP&E) was engaged to undertake a study to identify and assess future traffic impacts that would be caused by the proposed Laulani Commercial development.

Project Description

The Estate of James Campbell is proposing to develop a neighborhood shopping center on approximately 20 acres of land in the Ewa area of Oahu. The project is located adjacent to and west of Fort Weaver Road across the between the Ewa Beach community and the Ewa by Gentry residential subdivision. The project is expected to be completed and open by 1998.

The project will have 138,000 square feet gross leasable area consisting of retail shops, supermarkets, fast food restaurants, banks, etc. About 750 parking stalls will be provided for the center. Vehicular access to the project will be provided via an existing intersection with Fort Weaver Road and one new driveway. A service driveway is also provided along Fort Weaver Road.

Methodology

Analysis was conducted at the following intersections to determine the relative impact of the proposed project:

- Fort Weaver Road with Geiger Road,
- Fort Weaver Road with Prince Golf Course Access Road,
- Fort Weaver Road with two project driveways, and

- Project Access Road with Project Driveways.

Future traffic was forecasted at the study intersections by adding the following:

- Existing traffic volumes at the study intersections,
- Traffic generated by other nearby developments in the area that would impact the study intersections, and
- Traffic generated by the project.

This study assesses the impact on each intersection by determining the level-of-service[1] (LOS) for existing traffic conditions, 1998 forecast traffic without the project, and 1998 forecast with the project traffic.

The time periods analyzed were the morning and afternoon peak hours. These periods were selected to identify project traffic impacts since the project traffic would have the largest impact during these times.

Conclusions and Recommendations

The Laulani Commercial project is not expected to significantly impact traffic flow along Fort Weaver Road when the project is completed in the year 1998. However, it will impact the existing intersection of Fort Weaver Road and the Prince Golf Course Access Road where the main project access will be.

Presently, traffic flow along Fort Weaver Road is generally controlled by the signalized intersections along the highway and their spacing. The

[1] Level-of-Service - See Appendix A for definitions.

signalized intersection of Fort Weaver Road and Geiger Road is currently operating at LOS B and LOS C in the morning and afternoon peak hours, respectively. At the unsignalized intersection of Fort Weaver Road and the Prince Golf Course Access Road, motorists making left turns onto Fort Weaver Road experience very long delays (LOS E).

By the year 1998, even without the project, traffic flow conditions are expected to worsen due to the continuing development of the Ewa area. Fort Weaver Road as the only major roadway serving the east Ewa area is expected to be congested and over capacity. The intersection of Fort Weaver Road and Geiger Road is expected to operate over capacity and at LOS F.

Even without the project, the planned North-South Road which would run from Ewa Beach to the H-1 Freeway is needed to accommodate future traffic volumes. The Ewa Region Highway Transportation Master Plan identifies this improvement to relieve future traffic by providing an alternative route to Fort Weaver Road. With the North-South Road and additional turn lanes recommended in the Ewa Gentry Traffic Impact Study[2], the intersection of Fort Weaver Road and Geiger Road is expected to operate under capacity.

With the project in the year 1998, the results of the analysis indicate that the intersection of Fort Weaver Road and Geiger Road will continue to operate under capacity (LOS D or better). At the unsignalized intersection of Fort Weaver Road and the Project Access Road, motorists exiting the minor streets onto Fort Weaver Road are expected to experience very long delays. To provide for smooth traffic operations, we further recommend the following at the intersection of Fort Weaver Road and the Project Access Road:

---

[2]Traffic Impact Study, Ewa Gentry by Parsons Brinckerhoff, August 1988.

- Signalization when warranted.
- A left turn storage lane northbound along Fort Weaver Road for vehicles making left turns into the Project Access Road.

With the above improvements, the roads serving the project will have sufficient capacity to accommodate the project traffic.

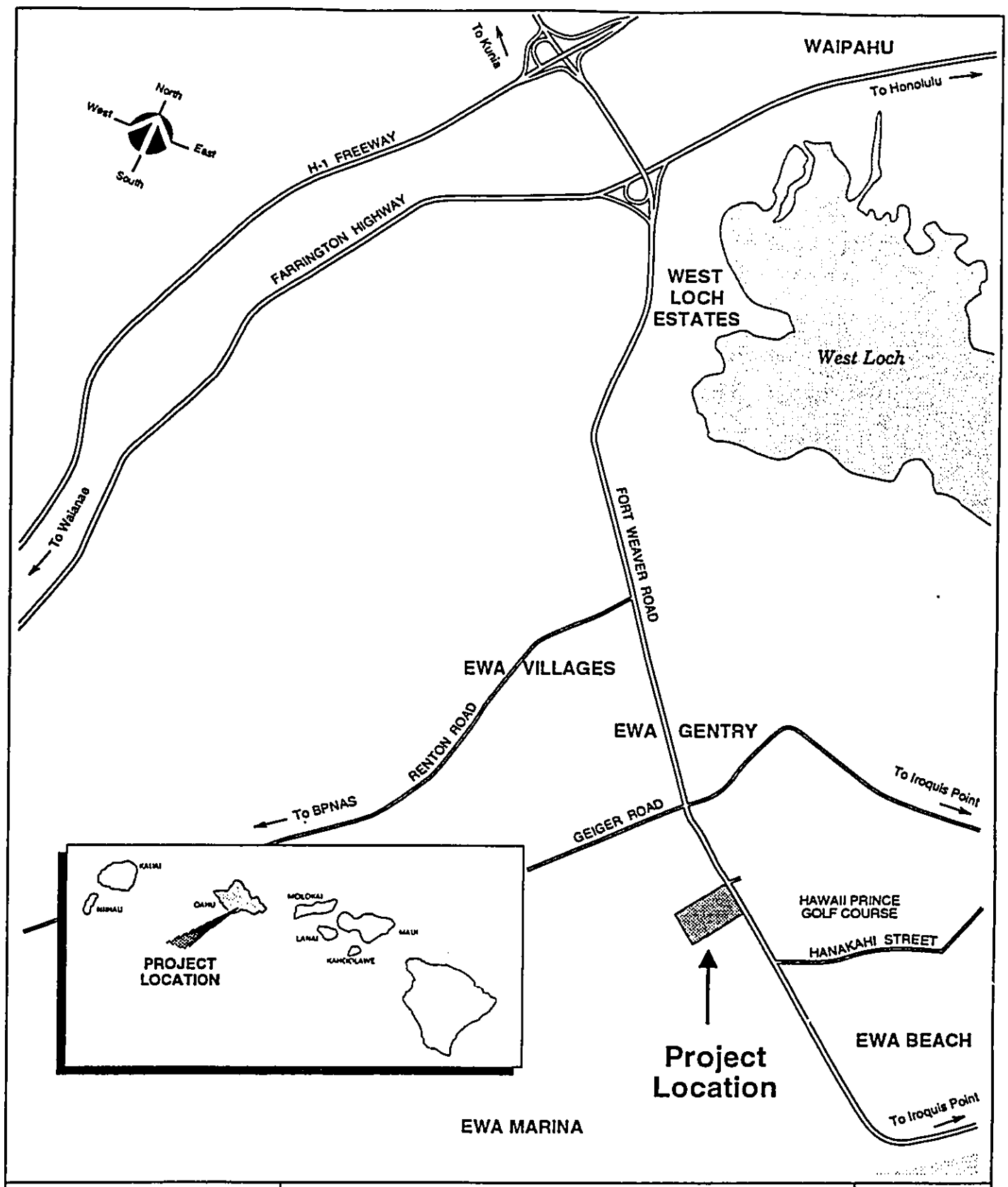
PROJECT DESCRIPTION

The Estate of James Campbell is proposing to develop a neighborhood shopping center on approximately 20 acres of land in the Ewa area. The project is located adjacent to and west of Fort Weaver Road across the between the Ewa Beach community and the Ewa by Gentry residential subdivision. Figure 1 shows the project location and roadway network in the vicinity. The project site is currently being used to grow sugar cane.

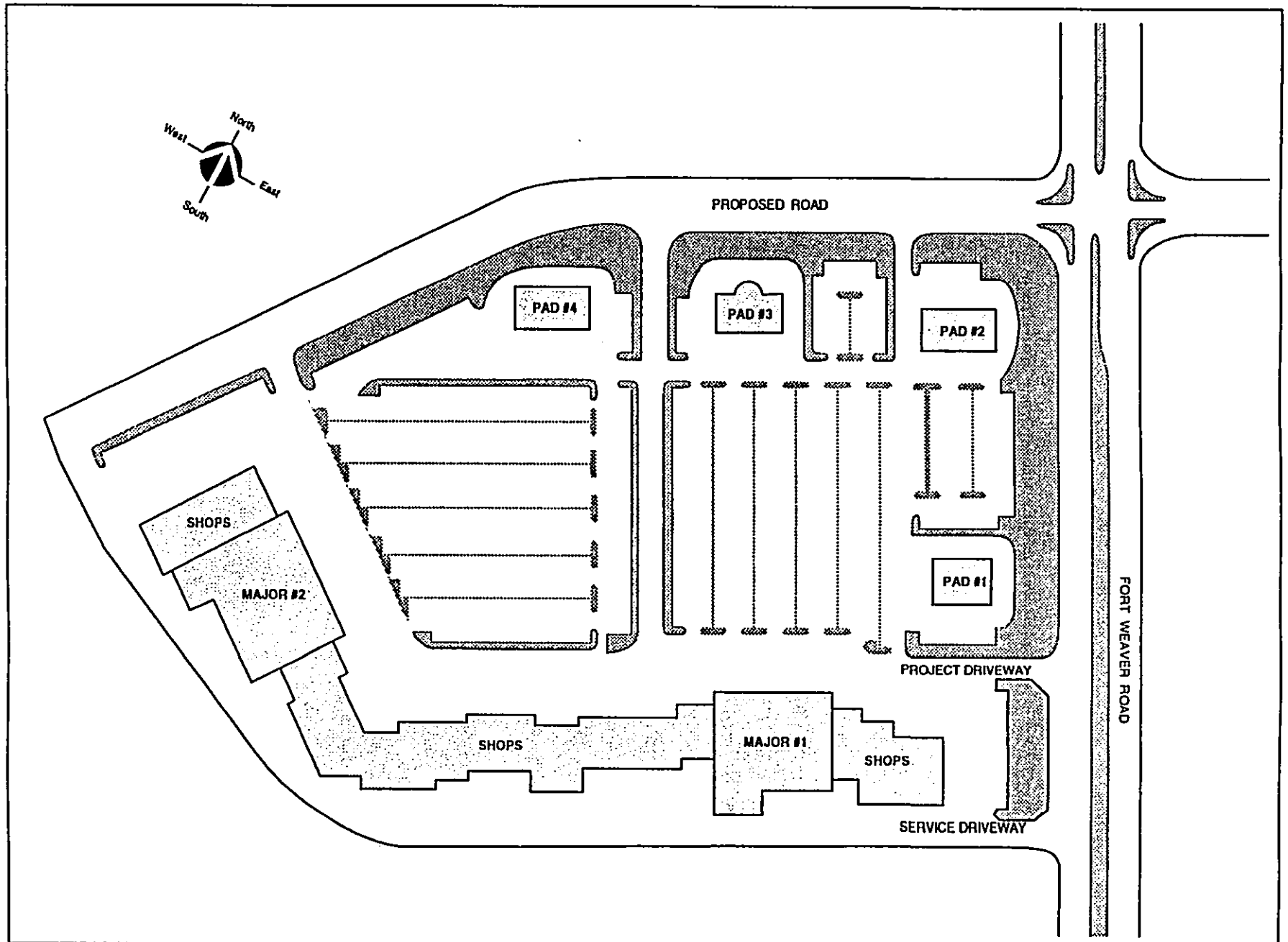
The project will have 138,000 square feet gross leasable area consisting of retail shops, supermarkets, fast food restaurants, banks, etc. About 750 parking stalls will be provided for the center. The site plan of the proposed development is presented in Figure 2. The project is expected to be completed in year 1998.

Vehicular access to the project will be provided via the addition of a fourth leg (Project Access Road) to the existing T-intersection of Fort Weaver Road with the Prince Golf Course Access Road and two new driveways along Fort Weaver Road. At this time, there are no plans to extend the project access road beyond the project site.

The shopping center will have four driveways along the new project road. There will also be one project driveway and one service driveway which will access directly onto Fort Weaver Road. These will be right turn in and right turn out only.



PACIFIC PLANNING & ENGINEERING, INC	Location Map	Figure 1



PACIFIC PLANNING ENGINEERING, INC.

Project Site Plan

Figure 2

EXISTING CONDITIONS

An inventory of existing conditions was conducted to better ascertain the current traffic conditions in the area and to provide a basis for estimating the potential traffic impact of the proposed project. The review included the land uses in the area, roadway facilities, and existing traffic conditions.

Land Uses

The land uses surrounding the project consist mainly of residential, military, and agricultural uses. The Ewa Beach community is located southeast of the project. The Barbers Point Naval Air Station (BPNAS) is to the west of the project and Iroquois Point military housing is to the east. To the north of the project, various developments are completed or under development such as West Loch Fairways, Ewa Gentry and Ewa Villages. Directly across the project site is the Hawaii Prince Golf Course. Sugar cane is grown in the areas between the residential and military areas.

Roadway Facilities

Fort Weaver Road serves as the only thoroughfare in the area, from Ewa Beach to West Loch Estates, providing vehicular access to the rest of Oahu.

Fort Weaver Road is a four lane divided arterial highway from the Kunia Interchange to the Ewa Beach community. The posted speed limit varies from 25 to 45 miles per hour (mph) with a speed limit of 35 mph in the vicinity of the project. The major intersections along Fort Weaver Road are signalized. Fort Weaver Road can be classified as a suburban arterial since the spacing of signalized intersections is less than two miles.

Geiger Road is a two lane road providing access to the Ewa by Gentry development and the Barbers Point Naval Air Station. The posted speed limit is 25 mph. The intersection of Fort Weaver Road with Geiger Road is signalized.

The project intersection is located about halfway between Geiger Road to the north and Hanakahi Street. to the south. Presently, there is an unsignalized T-intersection at the project site which provides access to the Prince Golf Course. Figure 3 shows existing laneage at the study intersection along Fort Weaver Road.

Traffic Conditions

State Department of Transportation 24-hour count data indicates that the peak traffic periods along Fort Weaver Road occur from 6:30 to 7:30 in the morning and 3:30 to 4:30 in the afternoon. Manual traffic counts were taken at the intersection of Fort Weaver Road and Geiger Road and also the intersection of the Hawaii Prince Golf Course Access Road and Fort Weaver Road. The counts were taken on Tuesday, November 30, 1993, from 5:00 to 8:00 am and from 3:00 to 5:30 pm. These counts were used as the baseline condition upon which future estimated traffic volumes were added.

Manual counts were taken of passenger cars, trucks and buses by turning movements and approaches. During the morning field counts, the weather was clear, however the roadway pavement was wet. The burning of sugar cane nearby caused some haziness from about 6:30 - 7:00 am. Afternoon field conditions were sunny and the roadway pavement was dry. Figures 4 and 5 shows the present volume of traffic at the study intersections. The manual traffic count data for the study periods is

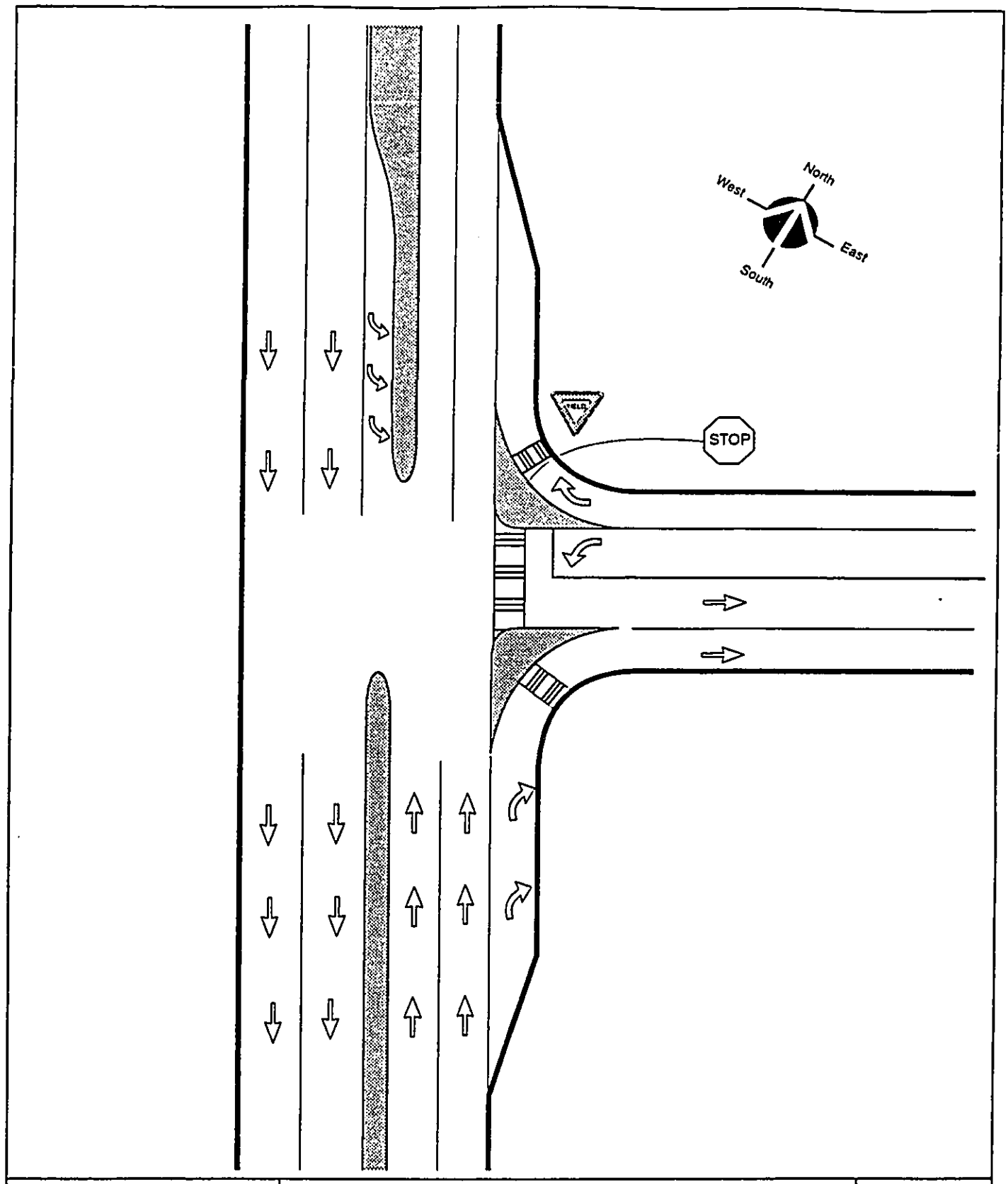
summarized in Appendix B.

Observed Traffic Conditions

The following observations were made during the field survey:

- A queue formed for vehicles making left turns Honolulu bound from Geiger Road from 6:45 to 7:00 a.m. and from 3:30 to 3:45 p.m. Several of these vehicles were not able to clear the intersection during the green phase of the cycle.

- Several vehicles were making U-turns (heading northbound after making the U-turn) at the intersection of the Prince Golf Course access road and Fort Weaver Road.



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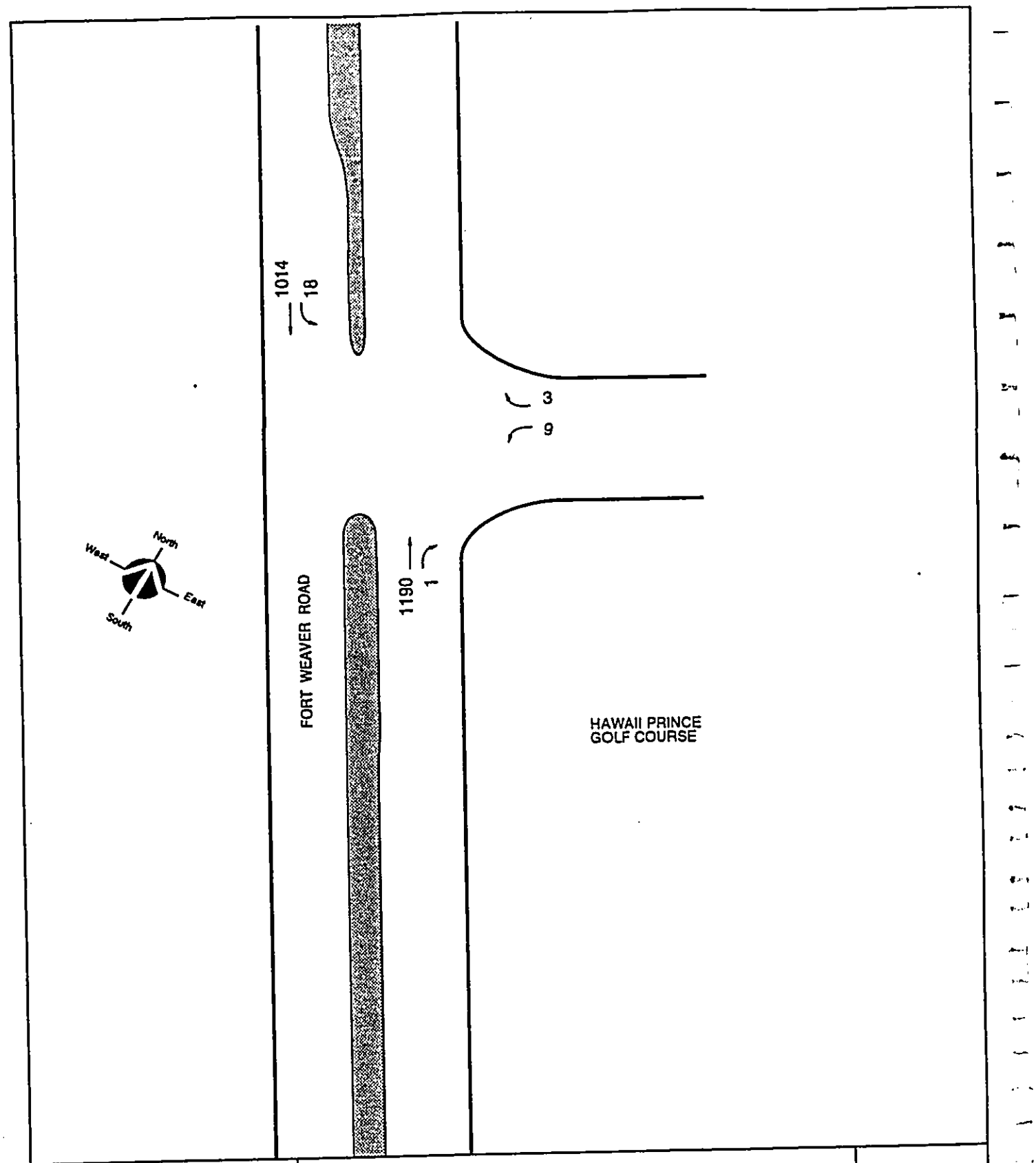
Existing Laneage

Figure 3



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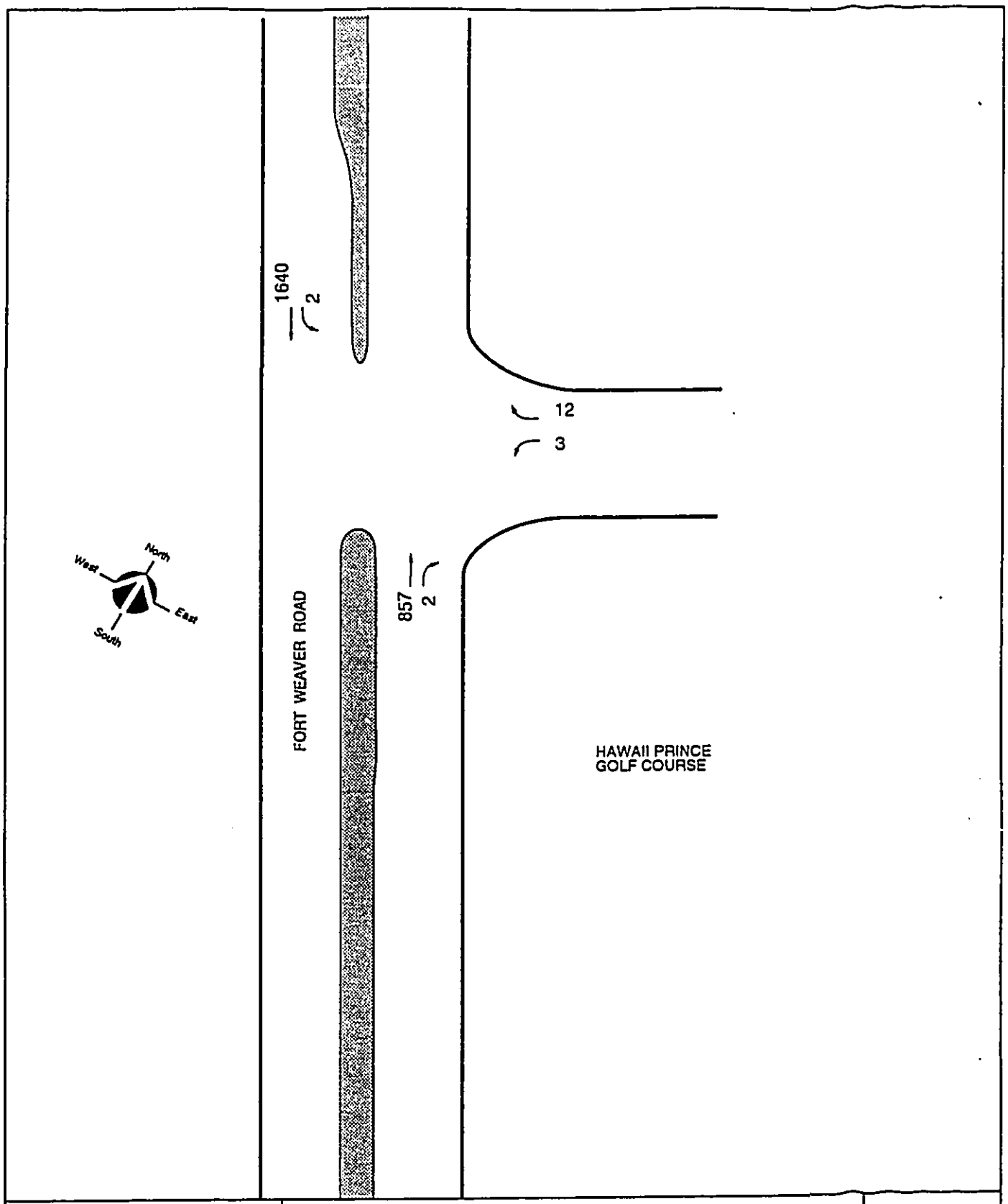
1993 Morning Peak Hour Traffic

Figure 4



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1993 Existing Afternoon Peak Hour Traffic

Figure 5

FUTURE CONDITIONS

A survey was conducted of approved planned developments in the immediate area to estimate future traffic conditions at the study intersections.

Land Uses

Traffic generated by the following approved developments within the Ewa area as shown in Table 1 below will impact the study intersection by the year 1998:

Table 1. Future Developments in the Ewa Area

Development	Major Land Uses
Ewa Beach Shopping Center Expansion	~70,000 square feet of gross leasable area
Ewa Gentry	~5,000 residential units, 55,000 sf Commercial
Ewa Marina	~1200 residential units, 350 hotel rooms
Ewa Villages	~1500 residential units, 90,000 sf Commercial
West Loch Estates	~180 residential units

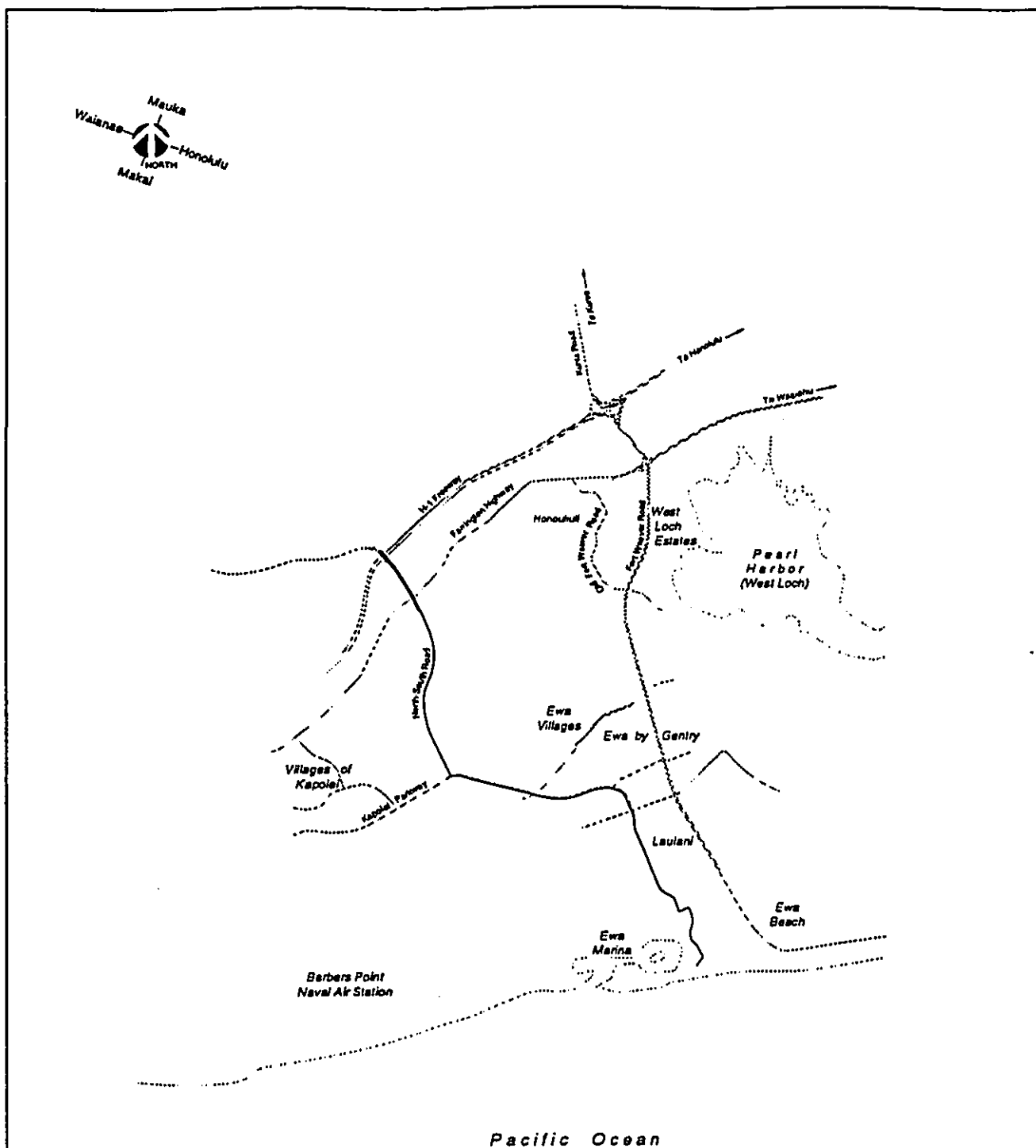
~ - approximate

In the next five years to 1998, the above major developments and others are expected to contribute to the need for regional highway improvements in the Ewa area.

Roadway Facilities

At the present time, there are no known committed highway improvements to Fort Weaver Road. There are, however, plans to provide new roads to accommodate the anticipated growth in traffic volumes along Fort Weaver Road.

The Ewa Region Highway Transportation Master Plan is being developed to identify roadway system improvements necessary to accommodate forecasted future traffic and allocate the cost for improvements to the developers in the Ewa region. A North-South Road is being planned as part of the Plan which would relieve traffic along Fort Weaver Road. However, the completion date of this road has not been set. Figure 6 shows the proposed location of the North South Road as shown in the Ewa Master Plan.



PACIFIC PLANNING & ENGINEERING, INC	North-South Road	Figure 6

PROJECTED TRAFFIC CONDITIONS

Future traffic was forecasted for the year 1998 for traffic conditions without and with the Laulani Commercial development.

Future Traffic Without Project

Future traffic without the project was forecasted by adding existing traffic volumes and the traffic from other proposed developments in the area.

Traffic From Other Developments

The three step procedure of trip generation, trip distribution, and traffic assignment was used to forecast traffic from other approved developments.

The trip generation step estimates the number of trips that would be generated by developments listed in Table 1 which would impact the study intersections.. Table 2 shows the estimated trips generated by each development.

Table 2. Trip Generation for Other Developments

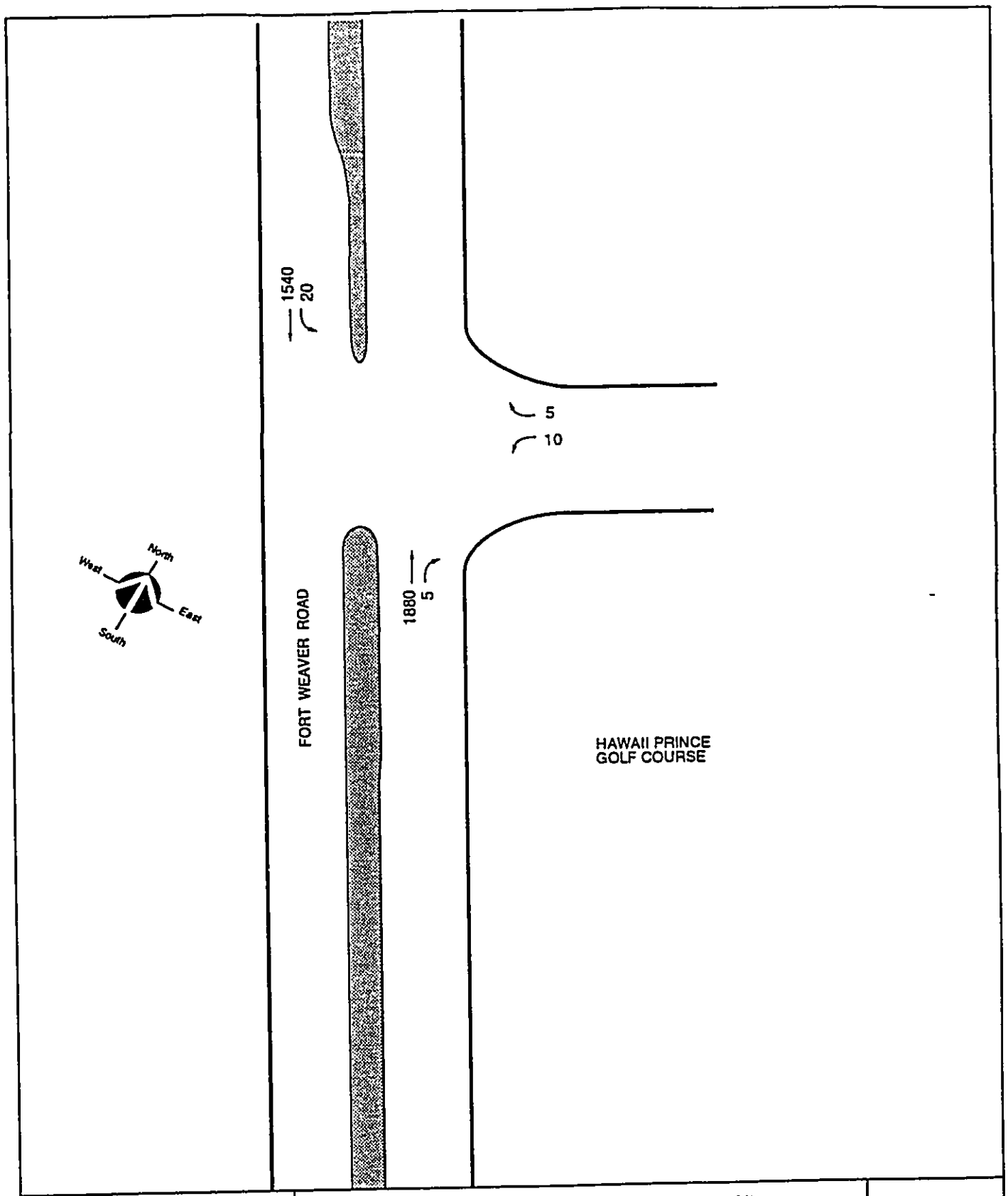
	Morning Peak Hour		Afternoon Peak Hour	
Development	Enter	Exit	Enter	Exit
West Loch Estates	34	98	116	66
Ewa Villages	506	825	1241	839
Ewa Gentry	918	2432	2872	1727
Ewa Beach Shopping Center Expansion	40	25	142	142
Ewa Marina	445	708	1156	825

The trip distribution step estimates the distribution of vehicle trips to their predicted destinations and origins. The trips generated by each development was distributed based on information provided by their respective traffic studies.

The traffic from each development was assigned to Fort Weaver Road since Fort Weaver Road is the only available road to carry traffic in the Ewa area.

1998 Traffic Volumes Without Project

The resulting weekday morning and afternoon peak hour traffic volume forecasts, without the project in year 1998 are shown in Figure 7 and 8, respectively.



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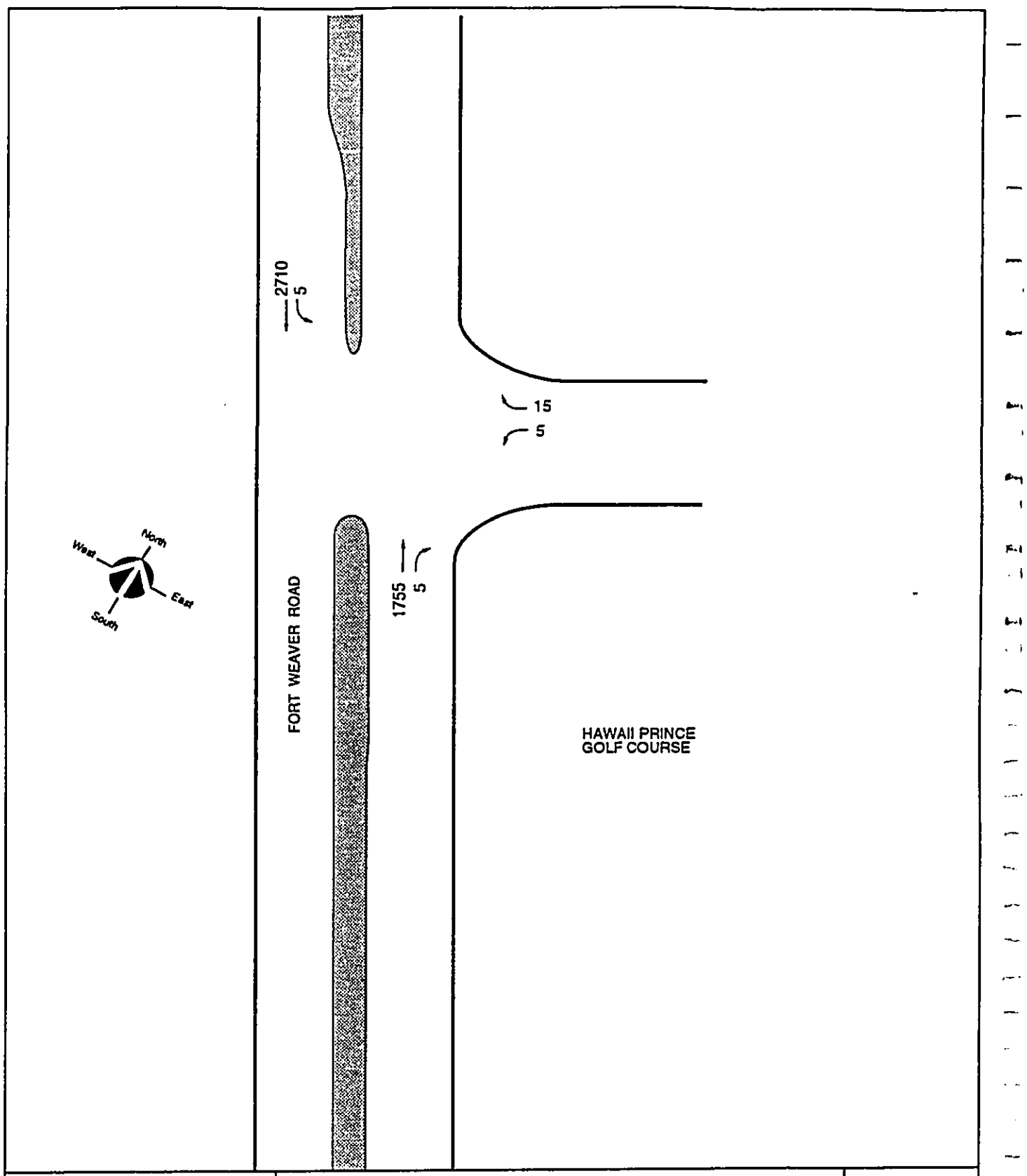
1998 Morning Peak Hour Traffic
Without Project

Figure 7



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1998 Afternoon Peak Hour Traffic Without Project

Figure 8

Future Traffic With Project

Future traffic with the project was forecasted by adding traffic generated by the Laulani Commercial project to the forecasted traffic without the project.

The standard three step procedure of trip generation, trip distribution, and traffic assignment was used to estimate peak hour traffic from the proposed project.

The number of trips generated by the project was estimated based on the project land uses and data from the ITE Trip Generation Report[3]. Table 3 shows the trip generation for the project.

Table 3. Project Trip Generation

			Morning Peak Hour		Afternoon Peak Hour	
Land Use	Quantity	Parameter	Enter	Exit	Enter	Exit
Fast Food Rest.	4000	sf	113	109	76	70
Fast Food Rest.	5000	sf	142	136	95	88
Bank	4000	sf	25	20	84	91
Bank	4000	sf	25	20	84	91
Shopping Center	121,000	sf	115	67	370	370
Total	138,000		420	352	709	710

sf = square feet

[3] Trip Generation Report, by the Institute of Transportation Engineers, Fifth Edition, 1991.

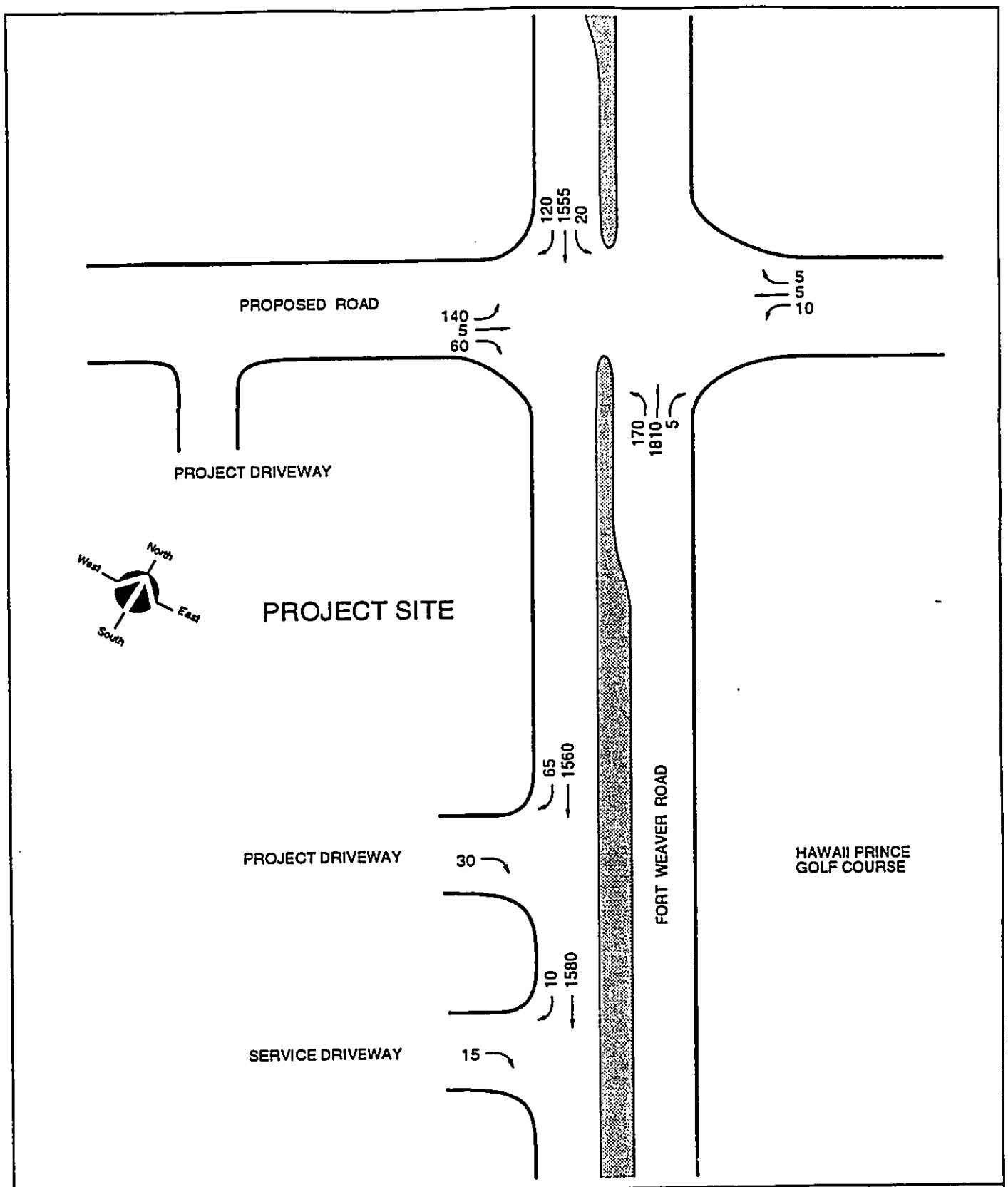
In the case of shopping centers and fast food restaurants, trips are attracted from the passing traffic on adjacent streets or traffic that is already "passing- by" the site. A portion of the trips that enter and exit the project site will be "Pass-by" trips and and do not add additional trips. The effect of "Pass-by" trips is to increase the number of turning movements into and out of the project site. The amount of "Pass-by" trips for the project was estimated based on data from the Trip Generation Report. For this case, Pass-by percentages of 51 and 42 percent were used for the fast food restaurants and shopping center, respectively.

The trip distribution step estimates the distribution of vehicle trips to their predicted destinations and origins. The trip distribution of the project was generally based on the distribution of population in the Ewa area. The project traffic was distributed with 58% to the north and 42% south of the project.

The traffic assignment step assigns vehicle trips to specific routes on the roadway network that will take the driver from origin to destination. All of the project traffic was assigned to Fort Weaver Road.

1998 Traffic Volumes With Project

Figures 9 and 10 show the traffic volumes for 1998 morning and afternoon Peak hours with project, respectively.



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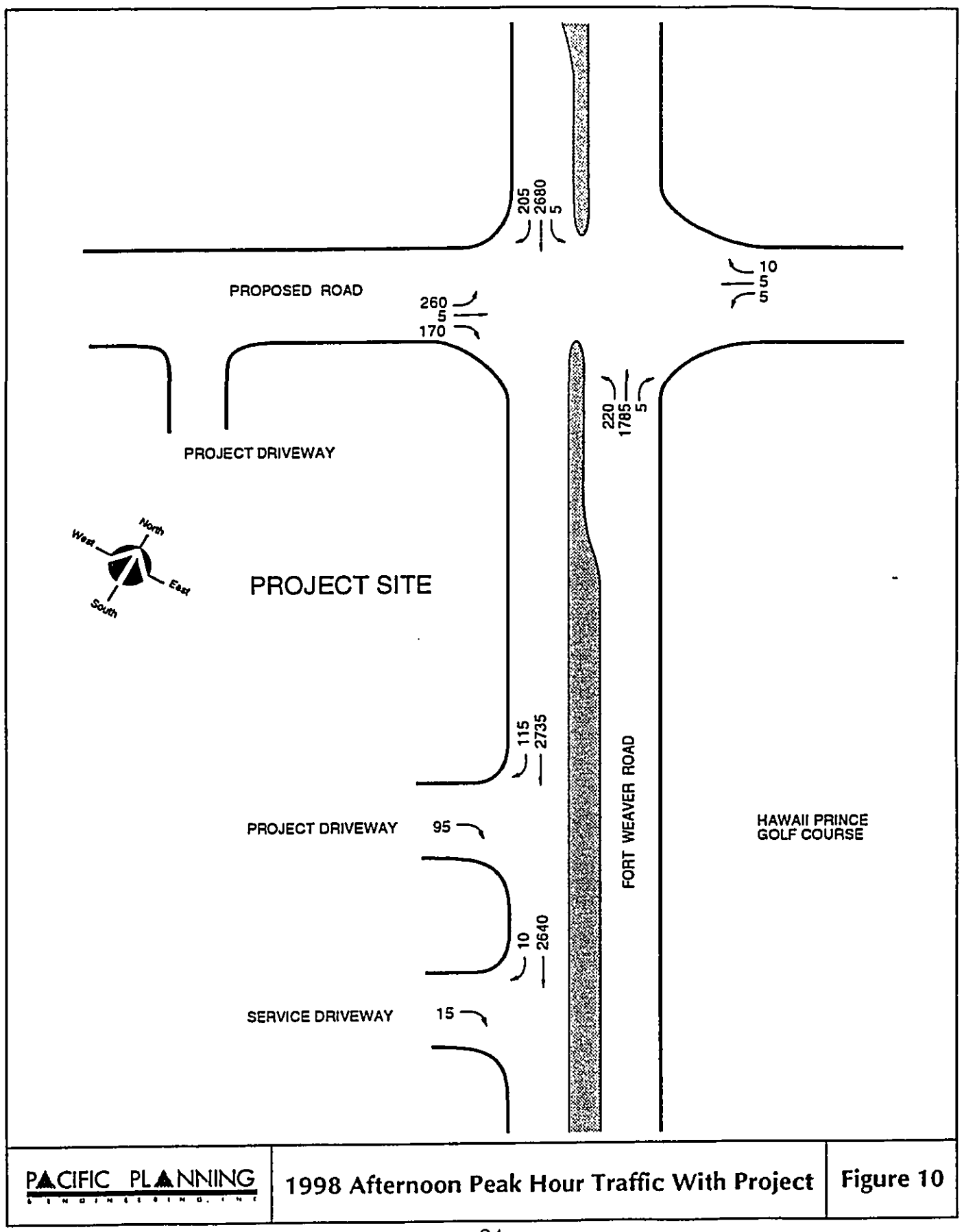
1998 Morning Peak Hour Traffic With Project

Figure 9



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1998 Afternoon Peak Hour Traffic With Project

Figure 10

TRAFFIC ANALYSIS

Analyses were conducted on the following intersections to determine the relative impact of the Laulani Commercial development on the local roadway system and to determine improvements to mitigate the impact of the project, if necessary:

- *Fort Weaver Road with Geiger Road*
  - Existing: Signalized T-intersection
  - 1998 Without Project: Signalized Cross intersection
  - 1998 With Project: Signalized Cross intersection
- Fort Weaver Road with Project Access Road/Prince Golf Course Road
  - Existing: unsignalized T-intersection.
  - 1998 Without Project: unsignalized T-intersection
  - 1998 With Project: unsignalized Cross intersection
- Fort Weaver Road with Project Driveway/Service Driveway
  - 1998 With Project: right turn in and right turn out of driveway only
- Project Access Road with Project Driveways

Analysis Methods

The study intersections were analyzed using methods outlined in the Highway Capacity Manual[4] unsignalized intersections.

The intersections of Fort Weaver Road with the project access road and Fort Weaver Road with the project driveway were analyzed as unsignalized intersections. The "level-of-service" (LOS) for unsignalized intersections is

[4] Highway Capacity Manual, Special Report 209, by the Transportation Research Board, National Research Council, 1985.

determined by the amount of reserve capacity for each turning movement. The reserve capacity is the amount of vehicles that could proceed through a conflicting traffic stream. LOS for unsignalized intersections is classified into six categories ranging from little or no delay (LOS A) to extreme delays (LOS F).

The intersection of Fort Weaver Road with the Geiger Road was analyzed using operational analysis for signalized intersections. For future conditions the following parameters were assumed: cycle length, signal timing and signal phasing. In addition, the intersection was analyzed with several improvements based on forecasted traffic in the Ewa Gentry development. The operational analysis uses the average delay per vehicle to measure traffic operating conditions.

The methodology for operational analysis measures traffic operations using the LOS rating, which ranges from A to F. The LOS for the traffic movements at a signalized intersection is classified into six categories ranging from less than 5 seconds of average delay per vehicle (LOS A) to over 60 seconds of average delay per vehicle (LOS F).

LOS for signalized and unsignalized intersections is not directly comparable, since the two analyses are based on different methodology and operating characteristics. Appendix A gives the LOS definitions for each analysis method.

Project Impact

The analyses were conducted for the existing, 1998 without project, and 1998 with project traffic conditions for the morning. and afternoon peak hours.

The roadway facilities were analyzed based on the existing roadway geometrics and any committed improvements to the existing facilities.

Analysis Results

The results of the analysis for the study intersections are shown in Tables 4 and 5 and described below.

Existing (1998):

- At the unsignalized intersection of Fort Weaver Road with the Prince Golf Course Access Road, motorists exiting the minor street attempting left turns onto Fort Weaver Road experience very long delays, LOS E.

- The signalized intersection of Fort Weaver Road with Geiger Road is operating at LOS B in the morning and LOS C in the afternoon.

Without the Project (1998):

- At the intersection of Fort Weaver Road and Prince Golf Course Road, operates at LOS E for motorists making left turns onto Fort Weaver Road.

- The signalized intersection of Fort Weaver Road with Geiger Road is expected to be over capacity and operate at LOS F.

With the Project (1998):

- At the unsignalized intersection of Fort Weaver Road with the Prince Golf Course/Project Access Road, motorists exiting the minor street attempting left turns onto Fort Weaver Road are expected to experience extreme delays, LOS F.

- Motorists exiting the project driveway and service driveways attempting right turns onto Fort Weaver Road are expected to experience little delays, LOS B, in the morning and long delays, LOS E and D, in the afternoon.

- Motorists entering and exiting the project driveways to the project access road are expected to experience little or no delays, LOS A.

Table 4. Unsignalized Intersection Analysis

Turning Movements	1993 Existing AM	1993 Existing PM	1998 Without Project AM	1998 Without Project PM	1998 With Project AM	1998 With Project PM
Intersection of Fort Weaver Road and Project Access Road/Prince Golf Course Access Road						
Fort Weaver Road						
Northbound LT	n/a	n/a	n/a	n/a	F	F
Southbound LT	C	B	E	D	F	D
Project Access Road						
Westbound LT	E	E	E	E	F	F
Westbound TH	n/a	n/a	n/a	n/a	F	F
Westbound RT	A	A	B	B	B	B
Eastbound LT	n/a	n/a	n/a	n/a	F	F
Eastbound TH	n/a	n/a	n/a	n/a	F	F
Eastbound RT	n/a	n/a	n/a	n/a	B	F
Intersection of Fort Weaver Road with Project Driveway and Service Driveway						
Project Driveway						
Eastbound RT	n/a	n/a	n/a	n/a	B	E
Service Driveway						
Eastbound RT	n/a	n/a	n/a	n/a	B	D
Intersection of Project Access Road with All Project Driveways						
Project Road						
Westbound LT	n/a	n/a	n/a	n/a	A	A
Project Driveways						
Northbound LT/RT	n/a	n/a	n/a	n/a	A	A

Notes:
AM - Morning Peak Hour
PM - Afternoon Peak Hour
LT - Left turn
RT - Right turn
TH - Through movement
n/a - Not applicable

Table 5. Signalized Intersection Operational Analysis
Intersection of Fort Weaver Road with Geiger Road

Turning Movements	1993 Existing AM	1993 Existing PM	1998 Without Project AM	1998 Without Project PM	1998 With Project AM	1998 With Project PM
Fort Weaver Road and Geiger Road						
Northbound Approach	B	B	F	F	F	F
Southbound Approach	B	C	E	F	E	F
Westbound Approach	C	C	F	E	F	E
Eastbound Approach	C	C	D	F	D	F
Overall Intersection	B	C	F	F	F	F
Ave. Delay per Vehicle (sec)	14.71	18.54	64.05	195.81	75.35	201.69
Volume/Capacity	0.51	0.69	1.07	1.19	1.11	1.18

Notes:
AM - Morning Peak Hour
PM - Afternoon Peak Hour

Improvement Measures

The findings of the impact analysis indicate that the signalized intersection of Fort Weaver Road with Geiger Road will operate over capacity, even without the project, by the year 1998. At the unsignalized intersection of Fort Weaver with the Prince Golf Course/Project Access Road, motorists exiting the minor street will experience extremely long delays, LOS F. Based on these findings, the following improvements were considered:

- The construction of the North South Road from Ewa Beach to the H-1 Freeway,
- Signalization of the intersection of Fort Weaver Road with the Project Access Road/Prince Golf Course Access Road, and

- Providing a left turn pocket in the median along Fort Weaver Road in the northbound direction. A schematic diagram showing the project intersection is shown in Figure 11.

With the construction of the North South Road, it is estimated that about 35% of the through traffic volumes along Fort Weaver Road would reroute to the North South Road. The study intersections were analyzed with the rerouted traffic.

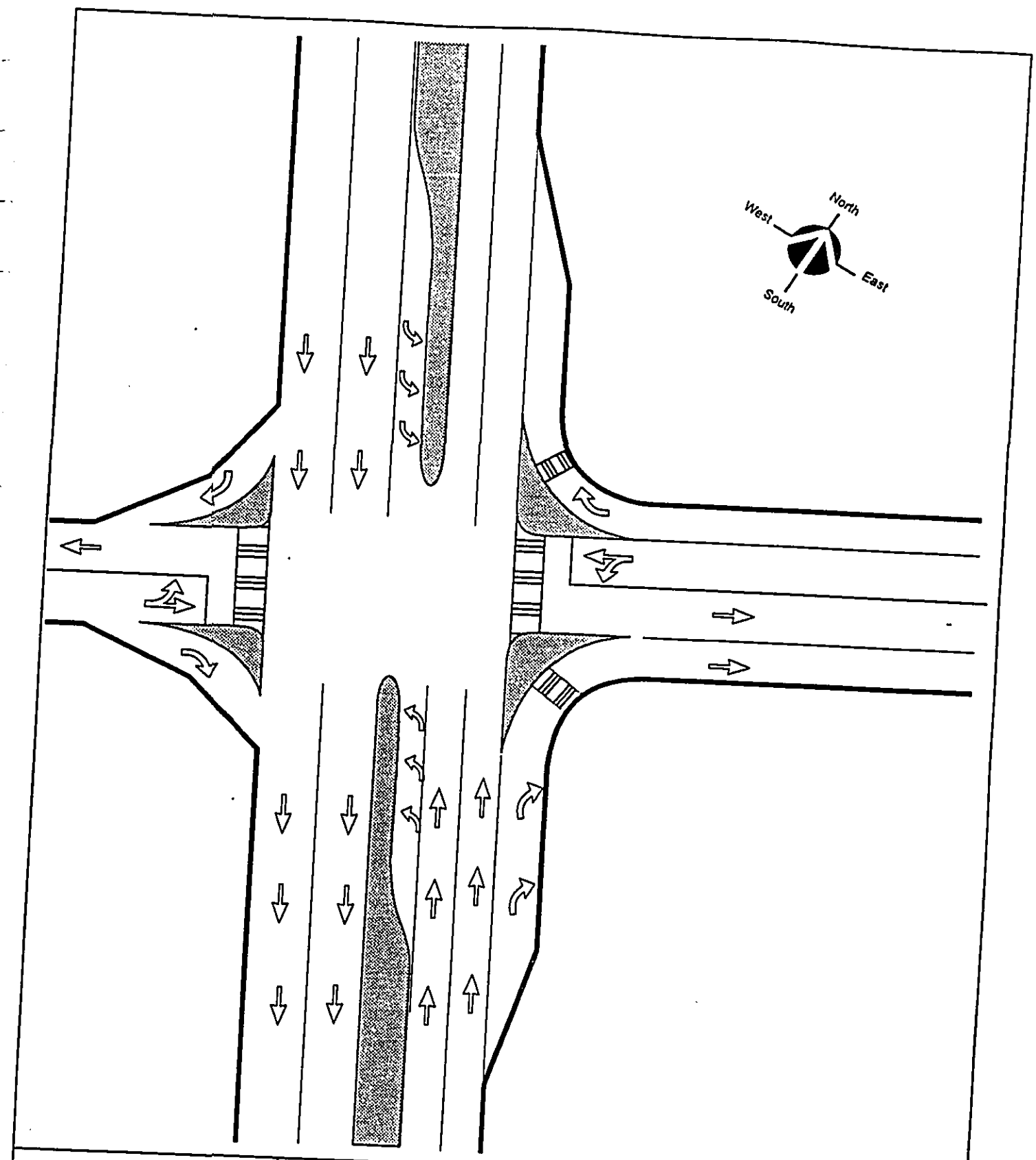
Traffic Signal Warrant

A review of a traffic signal warrants was conducted according to procedures in the Manual on Uniform Traffic Control Devices (MUTCD)[5] and available data. Warrant 11, based on peak hour traffic volumes, provides an indication of the need for traffic signal control, however, further studies should be completed before the final decision is made on signalizing an intersection. The results of the Warrant 11 check is shown in Table 6 below.

Table 6. Warrant 11 Results
Intersection of Fort Weaver Road with Prince Golf Course Road

Time Period	Major St Volume	Minor St Volume	Status
1993 Existing			
Morning Peak Hour	2225	15	Does Not Meet Warrant 11
Afternoon Peak Hour	2500	15	Does Not Meet Warrant 11
1998 Without Project			
Morning Peak Hour	3435	15	Does Not Meet Warrant 11
Afternoon Peak Hour	4470	15	Does Not Meet Warrant 11
1998 With Project			
Morning Peak Hour	3675	205	Meets Warrant 11
Afternoon Peak Hour	4890	435	Meets Warrant 11
1998 With Project (& North-South Rd)			
Morning Peak Hour	2500	205	Meets Warrant 11
Afternoon Peak Hour	3330	435	Meets Warrant

5 Manual on Uniform Traffic Control Devices, by the Federal Highways Administration, U.S. Department of Transportation, 1988.



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Schematic Layout of Project Intersection

Figure 11

Analysis Results

The results of the signalized intersection analysis for the study intersections are shown in Table 7 and described below.

- By 1998, the intersection of Fort Weaver Road and Geiger Road operates at LOS F even without the project.

- By 1998, the intersection of Fort Weaver Road with the Project Access Road operates at LOS B in the morning and LOS F in the afternoon.

If the North-South Road is constructed, it is estimated that 35% of the through traffic would reroute off Fort Weaver Road. Operational analysis was done for this case and is shown in Table 8:

- By 1998, the intersection of Fort Weaver Road and Geiger Road operates at LOS C for both the morning and afternoon peak hours.

- By 1998, the intersection of Fort Weaver Road with the Project Access Road operates at LOS B and C in the morning and afternoon peak hours, respectively.

Table 7. Signalized Intersection Analysis

Turning Movements	1993 Existing AM	1993 Existing PM	1998 Without Project AM	1998 Without Project PM	1998 With Project AM	1998 With Project PM
Fort Weaver Road and						
Project Access Road/Prince Golf Course Road						
Northbound Approach	n/a	n/a	n/a	n/a	B	B
Southbound Approach	n/a	n/a	n/a	n/a	B	F
Westbound Approach	n/a	n/a	n/a	n/a	C	C
Eastbound Approach	n/a	n/a	n/a	n/a	C	E
Overall Intersection	n/a	n/a	n/a	n/a	B	F
Ave. Delay per Vehicle (sec)	n/a	n/a	n/a	n/a	14.71	260.31
Volume/Capacity	n/a	n/a	n/a	n/a	0.73	1.27
Fort Weaver Road and Geiger Road						
Northbound Approach	B	B	F	F	F	F
Southbound Approach	B	C	E	F	E	F
Westbound Approach	C	C	F	E	F	E
Eastbound Approach	C	C	D	F	D	F
Overall Intersection	B	C	F	F	F	F
Ave. Delay per Vehicle (sec)	14.71	18.54	64.05	195.81	75.35	201.69
Volume/Capacity	0.51	0.69	1.07	1.19	1.11	1.18

Notes:
n/a - Not applicable
AM - Morning Peak Hour
PM - Afternoon Peak Hour

Table 8. Signalized Intersection Analysis (With North-South Road)

Turning Movements	1998 With Project AM	1998 With Project PM
Fort Weaver Road and		
Project Access Road/Prince Golf Course Road		
Northbound Approach	B	B
Southbound Approach	B	C
Westbound Approach	C	D
Eastbound Approach	C	D
Overall Intersection	B	C
Ave. Delay per Vehicle (sec)	11.24	21.14
Volume/Capacity	0.56	0.89
Fort Weaver Road and Geiger Road		
Northbound Approach	C	B
Southbound Approach	C	C
Westbound Approach	D	D
Eastbound Approach	D	D
Overall Intersection	C	C
Ave. Delay per Vehicle (sec)	22.41	20.99
Volume/Capacity	0.86	0.85

Notes:
n/a - Not applicable
AM - Morning Peak Hour
PM - Afternoon Peak Hour

CONCLUSIONS AND RECOMMENDATIONS

The Laulani Commercial project is not expected to significantly impact traffic flow along Fort Weaver Road when the project is completed in the year 1998. However, it will impact the existing intersection of Fort Weaver Road and the Prince Golf Course Access Road where the main project access will be.

Presently, traffic flow along Fort Weaver Road is generally controlled by the signalized intersections along the highway and their spacing. The signalized intersection of Fort Weaver Road and Geiger Road is currently operating at LOS B and LOS C in the morning and afternoon peak hours, respectively. At the unsignalized intersection of Fort Weaver Road and the Prince Golf Course Access Road, motorists making left turns onto Fort Weaver Road experience very long delays (LOS E).

By the year 1998, even without the project, traffic flow conditions are expected to worsen due to the continuing development of the Ewa area. Fort Weaver Road as the only major roadway serving the east Ewa area is expected to be congested and over capacity. The intersection of Fort Weaver Road and Geiger Road is expected to operate over capacity and at LOS F.

Even without the project, the planned North-South Road which would run from Ewa Beach to the H-1 Freeway is needed to accommodate future traffic volumes. The Ewa Region Highway Transportation Master Plan identifies this improvement to relieve future traffic by providing an alternative route to Fort Weaver Road. With the North-South Road and additional turn lanes recommended in the Ewa Gentry Traffic Impact

Study[6], the intersection of Fort Weaver Road and Geiger Road is expected to operate under capacity.

With the project in the year 1998, the results of the analysis indicate that the intersection of Fort Weaver Road and Geiger Road will continue to operate under capacity (LOS D or better). At the unsignalized intersection of Fort Weaver Road and the Project Access Road, motorists exiting the minor streets onto Fort Weaver Road are expected to experience very long delays. To provide for smooth traffic operations, we further recommend the following at the intersection of Fort Weaver Road and the Project Access Road:

- Signalization when warranted.
- A left turn storage lane northbound along Fort Weaver Road for vehicles making left turns into the Project Access Road.

With the above improvements, the roads serving the project will have sufficient capacity to accommodate the project traffic.

---

[6]Traffic Impact Study, Ewa Gentry by Parsons Brinckerhoff, August 1988.

APPENDIX A

DEFINITION OF LEVEL-OF-SERVICE

FOR

UNSIGNALIZED INTERSECTIONS
AND
SIGNALIZED INTERSECTIONS

DEFINITION OF LEVEL-OF-SERVICE FOR UNSIGNALIZED INTERSECTIONS

The concept of levels of service is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with Level-of-Service A representing the best operating conditions and Level-of-Service F the worst.

Level-of-Service definitions--In general, the various levels of service are defined as follows for uninterrupted flow facilities:

Level-of-Service A represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

Level-of-Service B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

Level-of-Service C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

Level-of-Service D represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

Level-of-Service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such a maneuver. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

Level-of-Service F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go wave, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-Service F is used to describe the operating conditions within the queue, as well as the point of the breakdown. It should be noted, however, that in many cases operating conditions of the vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow

which causes the queue to form, and Level-of-Service F is an appropriate designation for such points.

These definitions are general and conceptual in nature, and they apply primarily to uninterrupted flow. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them.

REFERENCE: Highway Capacity Manual (Special Report 209, 1985)

DEFINITION OF LEVEL-OF-SERVICE
FOR
SIGNALIZED INTERSECTIONS

Level of service for signalized intersections is defined in terms of *delay*. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Specifically, level-of-service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period.

Level-of service A describes operations with very low delay, i.e., less than 5.0 sec per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level-of-service B describes operations with delay in the range of 5.1 to 15.0 sec per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level-of-service C describes operations with delay in the range of 15.1 to 25.0 sec per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level-of-service D describes operations with delay in the range of 25.1 to 40.0 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or a high v/c ratios (volume of cars to capacity of intersection). Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level-of-service E describes operations with delay in the range of 40.1 to 60.0 sec per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle length, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level-of-service F describes operations with delay in excess of 60.0 sec per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

REFERENCE: Highway Capacity Manual (Special Report 209, 1985)

APPENDIX B

MANUAL TRAFFIC COUNT DATA

MANUAL TRAFFIC COUNT DATA

Intersection: Fort Weaver Road and Hawaii Prince Golf Course Access Road
Date: Tuesday, November 30, 1993

	Fort Weaver Road						Golf Course Access Road					
	Northbound			Southbound			Westbound			Eastbound		
Time (a.m.)	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
5:00 - 5:15		245	3	3	30		1		0			
5:15 - 5:30		314	1	3	41		0		0			
5:30 - 5:45		321	2	4	57		0		1			
5:45 - 6:00		159	3	3	43		1		0			
6:00 - 6:15		285	1	4	93		0		0			
6:15 - 6:30		274	2	10	113		1		0			
6:30 - 6:45		262	0	3	105		0		0			
6:45 - 7:00		252	1	22	182		1		0			
7:00 - 7:15		264	0	2	227		3		0			
7:15 - 7:30		297	0	8	283		2		1			
7:30 - 7:45		313	0	5	268		2		1			
7:45 - 8:00		319	1	3	254		2		1			
8:00 - 8:15		215	0	6	152		0		1			
Time (p.m.)	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
3:00 - 3:15		247	0	0	287		0		3			
3:15 - 3:30		213	2	3	272		0		1			
3:30 - 3:45		239	2	0	366		0		3			
3:45 - 4:00		209	1	0	409		1		7			
4:00 - 4:15		221	0	0	387		1		2			
4:15 - 4:30		219	0	2	454		0		1			
4:30 - 4:45		220	1	0	392		1		2			
4:45 - 5:00		223	0	1	384		1		3			
5:00 - 5:15		196	0	1	327		0		4			
5:15 - 5:30		189	0	0	370		0		4			
Study Periods:												
7:00 - 8:00 a.m.		**1193**	**1**	**18**	**1032**		**9**		**3**			
3:45 - 4:45 p.m.		**869**	**2**	**2**	**1642**		**3**		**12**			

Intersection: Fort Weaver Road and Geiger Road
Date: Tuesday, November 30, 1993

	Fort Weaver Road						Geiger Road					
	Northbound			Southbound			Eastbound			Westbound		
Time (p.m.)	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
5:00 - 5:15	5	240	0	4	28	4	29	2	2	0	2	7
5:15 - 5:30	7	307	0	7	36	3	65	7	5	0	0	22
5:30 - 5:45	13	308	0	6	52	20	54	2	5	0	3	31
5:45 - 6:00	19	140	0	8	35	16	45	4	8	0	5	21
6:00 - 6:15	25	260	0	12	83	35	82	9	10	0	12	46
6:15 - 6:30	44	230	0	18	93	66	58	14	20	0	17	30
6:30 - 6:45	41	221	0	29	88	90	65	19	15	2	34	29
6:45 - 7:00	48	204	0	37	144	100	59	26	38	0	58	31
7:00 - 7:15	44	220	0	29	189	60	48	11	38	0	63	23
7:15 - 7:30	40	257	0	11	242	41	56	15	41	0	60	29
7:30 - 7:45	15	298	0	6	218	43	54	3	53	0	27	24
7:45 - 8:00	20	299	0	9	215	44	40	11	39	0	20	16
8:00 - 8:15	34	181	0	4	135	33	54	14	17	0	14	18
Time (p.m.)	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
3:00 - 3:15	31	216	0	23	264	34	53	25	23	0	18	20
3:15 - 3:30	34	179	0	20	219	36	80	19	48	5	25	34
3:30 - 3:45	36	203	0	28	271	44	83	17	94	1	26	20
3:45 - 4:00	28	181	0	21	360	64	37	21	48	1	21	20
4:00 - 4:15	29	190	2	31	327	53	63	30	60	0	23	22
4:15 - 4:30	32	185	2	29	388	53	36	28	66	0	15	32
4:30 - 4:45	35	183	2	30	330	62	52	22	61	1	18	25
4:45 - 5:00	37	186	0	34	332	57	46	30	52	0	19	24
5:00 - 5:15	30	166	0	26	282	52	54	21	45	0	24	28
5:15 - 5:30	32	157	0	26	330	66	51	18	40	0	17	18

APPENDIX G

Market Study
Hallstrom Group

THE HALLSTROM GROUP INC.

REAL ESTATE
CONSULTANTS
& APPRAISERS

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January 3, 1994

Mr. David W. Rae
Manager - Community Development
James Campbell Estate
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Market Study of the Proposed
Laulani Commercial Development
Kapolei/Ewa, Oahu, Hawaii

Dear Mr. Rae:

At your request, we have completed a defined-scope market study analyzing the demand for the proposed Laulani commercial development to be located on 20 acres owned by the Campbell Estate along Fort Weaver Road abutting the Ewa by Gentry project to the north.

This proposed commercial project is designed to serve the surrounding residential communities, and is intended to compliment the rapidly changing Kapolei/Ewa region by enhancing the available neighborhood shopping alternatives in the area.

The conclusions from our study are presented as follows.

ARBITRATION
VALUATION AND
MARKET STUDIES

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EXECUTIVE SUMMARY

Introduction

The multi-decade effort by The Estate of James Campbell to transform Ewa cane fields into a modern urban center is among the most ambitious development programs in Hawaii history. Far surpassing in complexity the islands' famed destination communities and extensive master planned suburbs, the Kapolei/Ewa Long Range Master Plan design stretches over 30,000 acres, incorporating a diversity of ownerships, land uses, and intensities.

The intent of the Estate has been to provide a comprehensive "second city" for Oahu, helping accommodate the expanding economic and population growth which has occurred over the past four decades and is forecast to continue into the next century. Beyond responding to acute Oahu housing needs by providing an estimated 34,000 new units in Ewa by 2010, the master plan for the greater Kapolei region includes significant industrial, office, retail/service, resort and public facility components which will be the economic foundation for this envisioned evolutionary metropolis.

Using long-term forecasting analyses to determine the needs of a self-contained urban Oahu community, the Estate has developed an integrated land use design which should provide for maximization of resources and infrastructure while meeting expressed public goals. The implementation of the master plan has required cooperation between landowners, governmental agencies and concerned public groups, with initial signs pointing to successful and continuing concord among the parties.

Given the financial, creative and community support for the Kapolei/Ewa concept to date, the primary concern in achieving planning goals over coming decades is to assure a sufficient diversity of available land use types to meet all market needs.

A "successful" city is a living organism which draws its strength by building on elementary economic and real property development efforts and providing a reasonable diversity in its land use base.

Although demand for urban development surrounding the City of Kapolei will benefit from a general islandwide scarcity of alternative "zoned" sites, ultimately, regional prosperity is dependent upon the ability to attract enterprises and businesses forming a stable economic base within a desirable, well-serviced community master plan.

As a uniquely new urban center, Kapolei will require a wide range of supporting facilities if market acceptance is to be engendered on the scale envisioned. For the area to rise above a mundane fully suburban status (such as Hawaii Kai), it must possess cornerstone attributes desirable to new and expanding businesses and island residents.

Many of these basic regional amenities are either in place or proposed for the near future. The Barbers Point Harbor, Ko Olina Resort and Campbell Industrial Park are examples of on-going facility development supportive of urban growth, with the Kapolei Business Park, Kapolei Power Center, a University of Hawaii Kapolei Campus, and Kapolei Rapid Transit Station among significant current planning efforts.

Our assignment focused on answering three rudimentary study questions:

- **Is there sufficient market demand to for additional commercial development within the Kapolei/Ewa area given current and future population trends?**

- **Will the subject be an appropriate use of the site from a market perspective relative to accepted land use planning objectives, modern site planning techniques and the area environs?**

- **What will be the specific economic benefits to the Kapolei/Ewa and Oahu communities resulting from the Laulani commercial development.**

These issues were addressed through a comprehensive research and inquiry program utilizing data derived through market investigation, discussions with governmental agencies, the Hawaii media, other available public and private sources and documents, and from our files. The analytical process is identical to that which we have employed in numerous market studies completed throughout the islands in recent years, and our resulting conclusions are consistent in scope and magnitude with other assignments we have undertaken in Ewa/Central Oahu since the mid-1980s.

The pertinent results of our study are highlighted in this comprehensive **Executive Summary**. Supporting tabular data and narrative discussion follow.

In completing our assignment, we relied on numerous prior studies we completed for Campbell Estate in the subject area since the mid 1980's as well as several documents prepared by others.

A major concern in the analytical stage of our investigation is the status of the dollar-influenced economy in general and the Oahu sector specifically. Following a highly successful period in the late 1980s which enjoyed record-setting expansion in many industries and the real property market, there has been significant disturbance over the past two years.

Although the worldwide economy has suffered through a recessionary period since late 1990, the effects on the Oahu market have been moderate relative to other locales. Economic growth in the islands was at circa three percent in 1991, and while real estate activity diminished significantly from the hyper-demand experienced in the late 1980s, contrast to plunging levels on the mainland, it remained somewhat stable in many sectors.

The Oahu housing market fared better than most property categories throughout the state, buoyed by the continuing acute shortage of units islandwide, minimal employment loss, and declining mortgage interest rates. Prices did slump marginally and activity decreased markedly during the Summer and Fall of 1991, but both indicators have rebounded in recent months, though still below prior standards.

Beginning of year projections prepared by Hawaii's leading banks called for a rapid "recovery" in 1992-93, with overall annual economic growth of five-plus (and as high as ten) percent forecast and a resurgent visitor industry envisioned. Mid-year projection revisions moderated this optimism.

Our short-term analysis is somewhat more conservative, based on the traditional 18-plus month lag between mainland economic trends and their evidence in the Hawaii market. We believe the completion of numerous large-scale construction projects (notably central Honolulu office and condominium developments), coupled with the "belt-tightening" under way at many major corporations in the state, will create a ripple effect which results in a flat to nominal growth situation in the islands' economic structure during 1993.

However, we remain very bullish on the mid- to long-term prospects for the Oahu economy. The foundational industries of tourism, construction, the military, and the government continue to have favorable growth prospects, and the multi-decade transition from an agrarian to service-based economy is being effected statewide with minimal displacement. The expanding internationalization of the investment sector can only help the standing of the islands relative to alternative areas, and the increasing sophistication of the business community is readily apparent.

In assessing the impacts of the short-term trends on extended projections for Oahu real estate demand, it must be remembered that the market has historically been cyclical, moving from **slump to growth to hyper-appreciation** stages. This cycle can be seen repeatedly in data over the past three decades.

Each highly favorable market expansion period grew out of a recessionary situation, following the examples of the recessions of 1973-74 and 1981-82. All evidence points to a current status at the latter end of the "slump" stage, with movement likely to begin towards another "growth" stage by 1994.

While acknowledging the existing status of the Oahu real estate market, our analysis provided no justification to alter past projections calling for continued widespread expansion of the Oahu economy and population base into the 21st century. Despite the recent downturn, tens of thousands of new homes and millions of square feet of commercial space will still be required to fully service the island over the next 20 years.

Overview of the Kapolei/Ewa Region

The proposed Laulani commercial development is located within the **Ewa Taxation District** of the City and County of Honolulu, a 200 square mile region comprising the southwesterly quadrant of Oahu. The district, the island's largest, includes the Kapolei/Ewa and the majority of Central Oahu development plan areas.

Of specific concern in our analysis is the former section, which spreads across the Ewa Plain from Pearl Harbor to Barbers Point and encompasses the subject property.

Over the past two decades the Kapolei/Ewa District has experienced significant development, with the resident population nearly doubling since 1970, expanding at a compounded annual rate of more than 3.2 percent, or twice the statewide average. Capital investment and economic opportunities have commensurately escalated.

By year end 1992, the population of the district was estimated at 245,000, roughly 29 percent of the Oahu total, and there were some 40,000 jobs in the area, or about nine percent of island employment.

At present, the Kapolei/Ewa sub-region boasts a population of circa 44,000 residents (less than five percent of Oahu) and 5,000 jobs (about 1.1 percent of island totals). By 2010, the number of residents in this precinct is forecast to increase to 126,000 and local employment to more than 32,000 positions. The compounded rate of yearly growth for these critical indicators over the 17 year projection period if maximum levels are achieved, would be at 6.4 and 10.8 percent, respectively.

In light of the exceptional expansion of Honolulu since statehood, the movement of urban uses towards Ewa was logical and anticipated. Being constrained between the mountains and the sea, Honolulu has absorbed virtually all the vacant acreage to the east (Kahala-Hawaii Kai), and is rapidly re-developing the older neighborhoods of the urban core. Westward movement into Central Oahu and the Ewa Plain presents the most reasonable growth alternative, and has thus become the focus of construction activity.

Although there is ongoing debate as to the intensity of urban uses which should be allowed throughout the Kapolei/Ewa District, all private and public parties concede the vast, historically cane and pineapple cultivated region holds the best promise of meeting the acute housing and increasingly congestive lifestyle problems currently facing Oahu.

Over the past 15 years, a series of master-planned bulk acreage suburban projects have been built in the District to service the demand for residential and supporting neighborhood commercial land uses; Waipio Gentry, Mililani Town, Ewa by Gentry, and Makakilo provide prime examples.

For the most part, however, these communities were fundamentally oriented towards "bedroom" development, with residents anticipated to commute into downtown Honolulu for work. While the projects have achieved notable sales success, the daily movement of workers to jobs has engendered significant traffic problems due to an overburdened freeway system plagued by rush-hour chokepoints in the urban center. Also, the limited availability of diverse

commercial lands and services keeps the projects from embodying the desirable "self-contained" character of today's leading land use design concepts.

The **Kapolei/Ewa Long Range Master Plan** represents an attempt by the Campbell Estate and regional landowners to break the cycle of dependent suburban neighborhood development through creation of a comprehensive urban community which not only meets the commercial and service needs of the populace, but provides economic infrastructure and employment centers for the entire island.

According to the plan support document,

> "The principal development concept embraced by the master plan is to have Ewa develop as a self-contained "balanced" community providing a full range of urban services, housing jobs, businesses and public facilities consistent with a true urban center. A major goal of the plan (and public policies supporting the plan) is to balance growth in the residential population with growth in the regional economy so that future residents of Ewa will have the opportunity to work within the Ewa area. The development concept is supported by long-standing General Plan policies concerning the establishment of a Secondary Urban Center in Ewa in order to reduce growth pressures on the rest of the island. Essential components of the master plan concept include the development of a city center/urban nucleus, within and around which higher density land uses such as commercial, office retail, public facilities, major traffic arterials, and other urban-type land uses aggregate, surrounded by a range of residential densities to accommodate the residential needs of the new urban economy."
>
> From the original 1988 document, page 15.

To date, this balanced, urban nucleus development has included numerous projects, with others under-construction or in the advanced planning stages.

Outside of central Honolulu, no region statewide boasts of as complete or diverse an economic foundation as is emerging in Kapolei/Ewa. This infrastructure bodes well for the long-term market acceptance of the area.

In fact, Kapolei will share many similar basic land use attributes with Honolulu, as noted on the chart below:

Land Use	Honolulu	Kapolei/Ewa
Deep Draft Harbor	Port of Honolulu	Barbers Point Harbor
Industrial Area	Iwilei, Kakaako, Mapunapuna	Campbell Industrial Park and Kapolei Business Park
Financial/Office Center	Downtown	City of Kapolei
Resort District	Waikiki	Ko Olina
Retail/Service Projects	Ala Moana Center, Kahala Mall, Kakaako (Makai)	City of Kapolei, Kapolei Power Center
Lower to Moderate Housing	Makiki, Moiliili, Kaimuki	Ewa Gentry, Kapolei Villages, Laulani Fairways
Upscale Waterfront Housing	Kahala-Portlock	Ewa Marina
Moderate to Upscale Housing	Upper Makiki, Waialae Iki Mariner's Ridge	Makaiwa Hills
Recreation	Ala Wai Golf Course, Ala Moana Beach Park, Kapiolani Park	West Loch Golf Course, Ko Olina Golf Course, Onehua Park, Kapolei Park
Rapid Transit Corridors	In Planning	In Planning
Small Boat Harbor (Recreational)	Ala Wai Yacht Harbor	Ewa Marina
Freeway Access	H-1	H-1

Given the well-prepared, fully-serviced nature of the Kapolei/Ewa economic structure, there is every reason to believe it will achieve a similarly high level of integrated market success as Honolulu (over time), far surpassing the draw of alternative Central Oahu or other bedroom/suburban developments if the envisioned highly diverse land base is actualized. The cumulative attraction provided by this myriad of inter-supporting land use types is the stimulus leading to increasing product demand and long-term market acceptance.

Analysis of Demand

Potential market demand for commercial uses at the proposed Laulani commercial site is a combination of two factors, "need" for additional spatial opportunities resulting from an expanding population base, and the desirability or "marketability" of subject acreage.

Based on our investigation, we have concluded there is an economic need for commercial use of the Laulani site and that it offers sufficiently superior benefits to provide a competitive location.

Establishing the level of demand for the subject property is a function of two variables:

- **General** commercial economics and property demand created by the county as-a-whole; and,

- **Regional** demand demonstrated for the proposed use within the subject "community" (Kapolei/Ewa District).

For the first variable, county wide indicators are drawn from a variety of compiled data sources. The intent is to understand historic and current Oahu market trends as a foundation for regional projections.

For the second item, analysis is based on statistical population demand quotients, investigation of absorption rates being obtained at comparable locations in the area, and through interviews with regional leasing agents.

General Economic and Market Demand

The most insightful data regarding the demand for commercial economic activity throughout Oahu relates to the amount of construction and level of employment in these sectors. These two factors provide excellent background into the current and forecast status of market demand, as they illustrate the level of new capital investment and economic growth.

However, even depicting strong, long-term expansion, these factors may understate total gross demand for new commercial development. Many contend there is a substantial latent demand for additional inventory, which due to land use constraints or other reasons, has gone unmet.

Having limited land resources, the county is an integrated market unit, with demand in a given area placing stress on adjoining and outlying regions as well. In example, the tourism industry, though based in Waikiki, creates a need for services and suppliers spread throughout the island. Secondarily, the wage income earned by employees of the visitor business ripples through the commercial sectors of the regional economy where the worker resides.

Commercial construction and authorizations were reported by the Bank of Hawaii were $399,723,000 in 1992. Construction in Hawaii 1993 also states "...statewide nonresidential building permit values increased 2.4 percent after inflation. Following the 22 percent decline in nonresidential permit values in 1991, the slight rebound in 1992 suggests that the nonresidential segment's dependence on upscale commercial projects has been overstated." and "The unexpected strength of nonresidential construction can be partially attributed to retail and other commercial construction accompanying suburban growth in Central and West Oahu."

The rate of employment in the commercial sectors has escalated rapidly over the past several years. As of year-end 1992 there were some 315,000 employment opportunities on Oahu in the commercial/industrial fields (excluding sugar and pineapple manufacturing), according the state Department of Business Economic Development and Tourism. Governmental agencies estimate that by the year 2005, this figure will increase to nearly 400,000 jobs on Oahu.

These 85,000 new jobs will create the demand for 20,000,000 to 30,000,000 square feet of additional improved working space; or in excess of 2 million square feet per year until 2005. The acreage demand to accommodate these businesses will total 1,000 to 2,000 acres.

According to the Building Owners and Managers Association (BOMA), a healthy market has between 12 and 20 square feet of retail and service space per resident, with most major metropolitan areas at the upper-end of the range. This conclusion is echoed by the Urban Land Institute who, in a series of mid-1980 studies, found a regional average of 17 to 22 square feet per person throughout primary economic communities on the mainland.

As of 1993, there was an estimated 15,586,000 square feet of gross leaseable commercial floor area on the island, equating to 17.75 square feet for each county resident. As shown on Table 1, this represents a compounded annual growth rate in space of 2.45 percent since 1977, with a corresponding growth in population of 1.04 percent. One of the largest increases in past years due mainly to the completion of several new centers in 1993. The bulk of the new space is being occupied by national value retailers.

Regional Demand

Our focus has been on the Kapolei/Ewa sub-region, and in particular the communities located on either side of Fort Weaver Road.

In the past, commercial development in the Kapolei/Ewa District was minimized by county planners who focused on urban Honolulu; reflecting then-held public opinion and planning

SUMMARY OF RETAIL, SHOPPING AND SERVICE CENTER SPACE
ON OAHU FOR SELECTED YEARS 1977 TO 1993
Market Study of the Proposed Laulani Development
Ewa/Kapolei, Oahu, Hawaii

Year	Gross Leaseable Area in Sq. Ft. (1)	Resident Population of Island	Ratio of Retail and Service Space Per Person
1977	10,333,000	737,000	14.02
1978	10,436,000	742,600	14.05
1979	10,808,000	756,000	14.30
1980	10,974,000	764,600	14.35
1981	11,589,000	767,600	15.10
1982	—	776,100	—
1983	—	789,100	—
1984	—	797,800	—
1985	12,256,000	804,300	15.24
1986	12,488,000	810,400	15.41
1987	12,664,000	818,400	15.47
1988	12,948,000	824,100	15.71
1989	13,233,000	831,300	15.92
1990	13,570,500	839,400	16.17
1991	13,800,000	852,000	16.20
1992	14,036,000	864,800	16.23
1993	15,586,000	878,000 (2)	17.75
Compounded Annual Growth Rate for 1977 through 1993	2.45%	1.04%	1.40%
Average Annual Addition for 1977 through 1993	309,000	8,294	

Note: Complete data not available for all study years. 1993 figures are year end estimates.

(1) Includes all significant Neighborhood, Strip, Specialty, Community, Regional and Super Regional malls and centers. Excludes hotels.

(2) Population data not yet available. Number shown is estimate.

techniques. Now a reversal in concepts has been completed. In order to meet all areas of real property market demand (including commercial), planners view the Kapolei/Ewa region as a vast resource for development opportunities and seek to maximize use potentials.

A demonstration of the shortfall of commercial opportunities for area residents is provided by applying the ratio of retail and service space per person of 17.75 (as shown on Table 1) to the current population of 44,000 for the area. This demonstrates a current population based need of 781,000 square feet of space. Table 2 displays the present and near-term proposed neighborhood-oriented commercial centers. The total of 321,576 square feet includes the yet-to-be built second phase of the Kapolei Shopping Center and shows a shortfall of over 450,000 square feet at the present time. This shortage will only increase as more and more residents enter the region.

The net effect is though District residents were once (and in some respects still are) directed outside the area for necessary commercial-oriented services and space opportunities, the region is emerging as a destination for other island residents. Most of the commercial and industrial acreage needed to serve future demand increase islandwide will be located in the Kapolei/Ewa District.

The best available indicator of regional demand for retail space over the past several years is the vacancy rate being experienced by projects outside central Honolulu (Downtown to Waikiki). According to BOMA, various sources (including the Urban Land Institute and articles published by the Appraisal Institute) contend a "healthy" market has a minimum of three to seven percent vacancy at any given time to allow for business expansion, transitions and relocations, new businesses and a construction-period overhang.

The prevailing low vacancy rate is a primary indicator of the probable escalating demand and existing undersupply situation evident in the non-Honolulu commercial market sector. This opinion is buttressed by the rapid absorption evident in the recently completed retail/service centers in the Kapolei/Ewa District.

SUPPLY OF SIGNIFICANT NEIGHBORHOOD
RETAIL/COMMERCIAL SPACE
Market Study of the Proposed Laulani Development
Ewa/Kapolei, Oahu, Hawaii

Project	Year Built	Leasable Area (Sq. Ft.)	Occupancy	Major Tenants	Comments
Ewa Beach Shopping Center	1942	77,189	95%	Foodland, Woolworth	Potential plans for upgrading and expansion are being discussed.
Kapolei Shopping Center	1993	134,387	86%	Safeway, Longs	Construction of Safeway was completed in 1992, majority of space was absorbed quickly. Center is convenient for Makakilo residents.
Kapolei Shopping Center Phase II		110,000			Expansion to be completed in 1997.

Total Near Term Square Footage	**321,576**
Current Population Driven Need	**781,000 (44,000 persons X 17.75)**
Commercial Square Footage Shortfall in Ewa/Kapolei Region Rounded	**459,000**

Residential Growth Indicators

Within the Kapolei area, residential expansion has been occurring at record pace, converting the former cane fields to attractive family-oriented neighborhoods. Currently, there are some 44,000 residents in the region, anticipated to grow to 126,000 by 2010. Additions to the housing inventory in Kapolei between 1993 and 1995 is anticipated to exceed 12,000. The following paragraphs summarize the completed, underway and proposed additions to the area:

The **Villages of Kapolei** is a large public/private cooperative housing venture, which when complete will contain 5,000 households, four schools and a golf course as well as community parks. These villages include **Kumu Iki**, a 519-unit development completed in 1991; **A'eloa**, a 571-unit project which is under construction; **Malanai**, planned to be completed by the end of 1994, the 384 residences are being built in increments with some homes currently occupied; **Kekuilani**, containing 645 units expects to have occupancy of its first units in the first quarter of 1994; **Villages V, VI, VII and VIII**, are planned for a total of 1,200 units, with the first 256 units currently being developed by West Beach Estates.

Ewa By Gentry has 1,000 acres earmarked for development of in excess of 8,000 homes. Soda Creek, the first of six planned neighborhoods, was completed in 1988. Other developments completed or under construction include Sun Terra, Sun Rise, and Sun Terra on the Park. Over 2,800 homes have been completed within these developments and Gentry Development Company plans to construct over 800 new units in 1994.

Ewa Marina just recently received final governmental approvals to commence construction in 1994. This development is planned to contain 4,850 homes, a 1,400-slip marina (the first portion of the project which will be developed), supporting maritime commercial center, and a golf course.

Kapolei Knolls is planned for 368 homes to be built in mid- to late- 1994.

Makaiwa Hills is a future development by Campbell Estate (slated for 1997) which is planned to contain 4,000 residential units and supporting commercial development.

Originally developed 30 years ago by Finance Realty, **Makakilo** has continued to expand over the decades and currently contains approximately 3,500 residences. The community is planned to consist of nearly 6,200 homes when complete, slated to occur within the next six years.

Schuler Homes, Inc. is currently developing 500 multi-family units in a project called **Westview at Makakilo Heights**. The first phase of 148 units is complete.

An affordable rental project containing 250 units known as **Palailai Apartments** will commence construction in 1994.

Containing 490 acres, the **West Loch** community is a City and County of Honolulu development which includes 593 single-family units in the first phase completed in 1990; 150 rental units and an additional 718 units nearing completion. The city's West Loch Golf Course is also included within this development.

Another project by the City and County of Honolulu is the revitalization and expansion of **Ewa Villages** which were originally developed by the sugar plantation to provide housing for their workers. Current plans call for 1,200 new residences to be completed by 1997. A municipal golf course is also included in the plans and construction on the course commenced in spring 1993.

Commercial Expansion

The only new commercial retail space within the region which has been announced is the recently completed Kapolei Shopping Center. Containing 134,387 square feet, the first tenant to open for business was a 46,000 square foot Safeway store in late 1992. The shopping

center experienced rapid absorption and is nearly completely occupied with just over 10,000 square feet and one pad site vacant. Located in close proximity to the community of Makakilo, residents were overjoyed to finally have commercial support services near their community.

The Kapolei city center will be home to many government offices. The master plan currently calls for nine state offices and a judiciary complex all to be completed on a 40 acre parcel donated by Campbell Estate. The city and county government is also receiving 40 acres within the Kapolei city center for development of city and county offices. The James Campbell building, containing 54,000 square feet was recently completed and the Campbell Estate has moved its headquarters from Downtown Honolulu to Kapolei. The Kapolei Building, adjacent to the James Campbell Building, will be completed and ready for occupancy of its 67,500 square feet in 1994. Bank of Hawaii is building a 248,000 square foot facility within the City of Kapolei and will initially house 700 employees.

Ewa Marina has a commercial segment which is an integral component of the overall development. Construction on the marina is slated to commence in 1995 and completion 24 months hence. The developers do not envision any of the commercial facilities being developed within the next ten years at this project.

The only commercially oriented property within close proximity to the subject site is the Ewa Beach commercial center anchored by the Ewa Beach Shopping Center which is over 50 years old. The center is slated for upgrading and possible expansion, but a timetable has not yet been established.

Commercial expansion in West Oahu has been fairly significant in the past year with the opening of Waikele Center, and the Hawaii Power Center. These centers feature national value retailers and factory stores and have a statewide consumer base. <u>These centers are not considered competitive</u> with the proposed neighborhood shopping character of the Laulani site. Although residents will travel from all parts of the island (and even neighbor islands) to

visit the large-scale "power centers," the immediate needs of the community surrounding the Laulani project are not being served by currently existing and proposed neighborhood retail centers.

Conclusions

The demand for commercial real property uses in the Ewa/Kapolei District is substantial, currently and as projected over the next two decades. The historically under-serviced region is undergoing unparalleled development as the District becomes the focal point for islandwide development.

The current supply of available finished space is very low, and quality developable acreage holdings are scarce. While substantial inventory is proposed over the long-term, it is focused on areas not in close proximity to the subject site, which would serve the surrounding residential expansion (much of which is already in place) as well as the residents of the older Ewa Beach community. Additionally the ability of these master-planned projects to meet all segments of market demand is unlikely, particularly as demand from elsewhere on Oahu will be directed to the District and Ko Olina visitors create pressure for tourism-oriented businesses.

The most critical period is over the short-term; servicing currently unmet demand and the additional demand over the next several years as the population/consumer base increases as more residential projects are completed and before major commercial projects proposed for the region come on-line.

We conclude that existing and proposed supply is insufficient to meet current and projected demand levels, especially over the next three to five years.

The Laulani commercial segment is located appropriately for the proposed commercial designation, physically and competitively. Having in-place infrastructure, excellent access

potentials and supporting residential development, makes it a particularly favorable location for meeting existing unmet and short-term market demand.

It is therefore the conclusion of our study, the proposed re-classification of a 20 acre portion of the Laulani site from an Agriculture to Commercial designation is justified by market indicators and a prudent addition to the regional land use inventory.

This study is subject to the attached limiting conditions and assumptions.

CERTIFICATION

The undersigned do hereby certify that, to the best of our knowledge and belief, the statements of fact contained in this report are true and correct. It is further certified that the reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, unbiased professional analyses, opinions, and conclusions. We further certify that we have no present or prospective interest in the property that is the subject of this report, and have no personal interest or bias with respect to the parties involved. Our compensation is not contingent on a predetermined value or direction in value that favors the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event. The appraisal analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute and the Uniform Standards of Professional Appraisal Practice. The use of this report is subject to the requirements of the Appraisal Institute relating to review by duly authorized representatives. The undersigned certify that they have made personal inspections of the property that is the subject of this report. No persons provided significant professional assistance other than the undersigned.

The Appraisal Institute conducts programs of continuing education for their designated members. As of the date of this report, James E. Hallstrom, Jr., has completed the requirements of the continuing education program of the Appraisal Institute.

Respectfully submitted,

THE HALLSTROM GROUP, INC.

James E. Hallstrom, Jr., MAI, SRA
Hawaii State Certified
General Appraiser, CGA-178
Exp. Date December 31, 1995

Anne C. Rust

JEH/acr/as

LIMITING CONDITIONS AND ASSUMPTIONS

The research, analysis, conclusions, and certification for valuation or market studies performed by The Hallstrom Group, Inc. are subject to and influenced by the following:

- The report expresses the opinion of the signers as of the date stated in the letter of transmittal, and in no way has been contingent upon the reporting of specified values or findings. It is based upon the then present condition of the national and local economy and the then purchasing power of the dollar.

- Legal descriptions used within the report are taken from official documents recorded with the State of Hawaii, Bureau of Conveyances, or have been furnished by the client, and are assumed to be correct. No survey is made for purposes of the report.

- Any sketches, maps, plot plans, and photographs included in the report are intended only to show spatial relationships and/or assist the reader in visualizing the property. They are not measured surveys or maps and we are not responsible for their accuracy or interpretive quality.

- It is assumed that the subject property is free and clear of any and all encumbrances other than those referred to herein, and no responsibility is assumed for matters of a legal nature. The report is not to be construed as rendering any opinion of title, which is assumed to be good and marketable. No title information or data regarding easements which might adversely affect the use, access, or development of the property, other than that referenced in the report, was found or provided. The property is analyzed as though under responsible ownership and competent management.

- Any architectural plans and/or specifications examined assume completion of the improvements in general conformance with those documents in a timely and workmanlike manner.

- Preparation for, attendance, or testimony at any court or administrative hearing in connection with this report shall not be required unless prior arrangements have been made therefor.

- If the report contains an allocation of value between land and improvements, such allocation applies only under the existing program of utilization. The separate valuations for land and building must not be used in conjunction with any other purpose and are invalid if so used.

- If the report contains a valuation relating to a geographical portion or tract of real estate, the value reported for such geographical portion relates to such portion only and should not be construed as applying with equal validity to other portions of the larger parcel or tract; and the value reported for such geographical portion plus the value of all other geographical portions may or may not equal the value of the entire parcel or tract considered as an entity.

- If the report contains a valuation relating to an estate in land that is less than the whole fee simple estate, the value reported for such estate relates to a fractional interest only in the real estate involved, and the value of this fractional interest plus the value of all other fractional interest may or may not equal to the value of the entire fee simple estate considered as a whole.

- It is assumed that there are no hidden or inapparent conditions of the property, subsoil, or structures which would render it more or less valuable; we assume no responsibility for such conditions or for engineering which might be required to discover such factors.

- Nothing in the report should be deemed a certification or guaranty as to the structural and/or mechanical (electrical, heating, air-conditioning, and plumbing) soundness of the building(s) and associated mechanical systems, unless otherwise noted.

- Information, estimates, and opinions provided by third parties and contained in this report were obtained from sources considered reliable and believed to be true and correct. However, no responsibility is assumed for possible misinformation.

- Possession of the report, or a copy thereof, does not carry with it the right of publication, and the report may not be used by any person or organization except the client without the previous written consent of the appraiser, and then only in its entirety. If the client releases or disseminates the reports to others without the consent of the appraiser, the client hereby agrees to hold the appraiser harmless, and to indemnify the analysts from any liability, damages, or losses which the analysts might suffer, for any reason whatsoever, by reason of dissemination of the report by the client. Further, if legal action is brought against the analyst by a party other than the client concerning the report or the opinions stated therein, the client agrees, in addition to indemnifying the analysts for any damages or losses, to defend said analysts in said action at client's expense. However, nothing herein shall prohibit the client or analysts from disclosing said report or opinions contained therein as may be required by applicable law.

- Disclosure of the contents of this report is governed by the By-Laws and Regulations of the Appraisal Institute. Neither all nor any part of the contents of this report

(especially any conclusions as to value, the identity of the appraisers or the firm which they are connected, or any reference to the Appraisal Institute or to the MAI designation) shall be disseminated to the public through advertising media, public relations media, news media, sales media, or any public means of communication without the prior consent and approval of the appraisers.

- Unless otherwise stated in this report, the existence of hazardous material, which may or may not be present on the property, was not observed by the appraiser. The appraiser has no knowledge of the existence of such materials on or in the property. The appraiser, however, is not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation, or other potentially *hazardous materials may affect the value of the property.* The value estimate is predicated on the assumption that there is no such material on or in the property that would cause a loss in value. No responsibility is assumed for any such conditions, or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.

- The Americans with Disabilities Act (ADA) became effective January 26, 1992. We have not made a specific compliance survey and analysis of this property to determine whether or not it is in conformity with the various detailed requirements of the ADA. It is possible that a compliance survey of the property together with a detailed analysis of the requirements of the ADA could reveal that the property is not in compliance with one or more of the requirements of the act. If so, this fact could have a negative effect upon the value of the property. Since we have no direct evidence relating to this issue, we did not consider possible noncompliance with the requirements of ADA in estimating the value of the property.

EXHIBIT 1

Planning Department
Development Plan Land Use Map Amendment and
Environmental Assessment Preparation Guidelines

DGP 12/92

PLANNING DEPARTMENT
DEVELOPMENT PLAN LAND USE MAP AMENDMENT
AND ENVIRONMENTAL ASSESSMENT

Instructions

The attached application outline is a standard department format for any request to amend the City's Development Plan Land Use Map(s). A brief description of the minimum information required for various sections of the application appears in italicized print below. Complete information for all items must be provided by the applicant or agent in order for the department to initiate the Development Plan Land Use Map amendment process.

Completed applications shall be submitted to the department in accordance with Section 24-1.13. of the Development Plan Common Provisions related to Amendment Procedures and with the Rules of the Department of General Planning for Processing Amendments to the Development Plans.

Applications shall be neatly typed on 8 1/2" X 11" white paper. Any maps included with the application shall be on: 8 1/2" X 11" or 8 1/2" X 14" or 11" X 17" white paper (land use designations, etc. on the maps may be in color).

Any required maps that are <u>underlined</u> in the attached application items must use the department's Development Plan Maps as a base. Other base maps for any underlined required maps will not be accepted. For other support maps included in the application, it is recommended that at least one map(s) be done to a scale of approximately 1" = 1,000'.

Return the four copies of the completed application and required application fee to:

City & County of Honolulu
Planning Department
Attn: Community Planning Division
650 South King St. 8th Floor
Honolulu, HI 96813

APPLICATION FOR DEVELOPMENT PLAN LAND USE MAP AMENDMENT AND ENVIRONMENTAL ASSESSMENT

Section I. Background Information

Project Name	*Name of proposed project*
Agent	*Agent's name and business and/or mailing address*
Applicant	*Applicant's (or company's) name and business and/or mailing address. For other than State or City department, applicants hall include a statement concerning their property interests in the land.*
Landowner	*Landowner's (or company's) name and business and/or mailing address*
Location	*General location of proposed project including name of community the project is being proposed in and DP area name*
Address	*Address of project, if applicable*
TMK	*Tax Map Key*
Area	*Total land area of the proposed project based on TMK in acres or square feet*
Required Maps:	*Project location map, Tax Map Key (optional)*

Section II. Land Use Information

State Land Use	*State Land Use district boundary classification*
DPLU Map	*Existing DP Land Use Map designation*
DPPF Map	*Existing DP Public Facilities Map designation*
Zoning	*Existing zoning designation*
Request	*Brief description of requested land use redesignation including; total number of residential units being proposed and/or total number of square feet (for commercial, industrial, mixed use) and, requested*

amendment (e.g. From: Agriculture, To: Residential)

Required maps: *State Land Use District, DP Land Use*

Section III. Description of Property

Existing Use	*Description of existing use of the proposed project site*
Surrounding Uses	*Description of existing and any future plans for surrounding land uses within the immediate area*
Topography	*Description of property's topography*
Soils	*Description of various soil types including Soil Conservation Service and Land Study Bureau's ratings of property soils*
Slope	*Description of slopes*
Boundaries	*Description of property boundaries*

Required maps: *Topography, soils, slope*

Section IV. Development Proposal

Proposed use	*Description of proposed land uses including: estimated acreage for various DP land use categories, number of units for Residential, LDA, etc., estimated net densities and, type of units (e.g. % affordable)*
Timetable	*Project schedule, milestones, etc. indicating estimated timetable to complete project*
Project cost	*Estimated project costs including cost of infrastructure, land, etc.*
Project need	*Justification for proposed project including project market analysis and/or market study*

Required maps: *Proposed land use map, Preliminary site plan*

Section V. Conformance to Federal, State and City Plans and Programs

Approvals Needed	*List government approvals and/or permits needed for proposed project and agency responsible (e.g. SMA permit: City Dept. of Land Utilization)*
Federal	*Description of applicable plans and programs*
State	*Description of applicable plans, programs and policies including; the Hawaii State Plan, State Functional Plans and other plans*
City	*Description of applicable plans, programs and policies including; the County General Plan, Development Plan Common and Special Provisions, Development Plan Land Use Map(s), Development Plan Public Facilities Map(s), the Oahu Water Management Plan, the Waikiki Master Plan and other applicable plans*
Required maps:	*N/A*

ENVIRONMENTAL ASSESSMENT ITEMS

Section VI. Socio-economic Impacts

Demographic	*Information and discussion of existing vs. anticipated demographic impacts of the proposed project including: 1) Residential population, 2) Visitor population, 3) Character of neighborhood, 4) Displacement of residents and, 5) Other Social Impacts*
Economic	*Information and discussion of existing vs. anticipated economic impacts of the proposed project including: 1) Economic growth, 2) Employment and, 3) Government revenues vs. government costs*
Housing	*Information and discussion of existing vs.*

anticipated impacts of additional housing in the region including: 1) Intended market, 2) Projected price ranges for units and, 3) provision of affordable housing in relation to State and City housing policies

Public Facilities Information and discussion of existing vs. anticipated impacts of the proposed project on the following public facilities and services

1. Transportation (including public transit)
2. Water
3. Wastewater
4. Drainage
5. Solid waste
6. Schools
7. Parks
8. Police
9. Fire
10. Utilities

Required maps: Necessary support maps indicating location, alignment, etc. of various public facilities in relation to the proposed project site

Section VII. Environmental Impacts

Noise Information and discussion of existing vs. anticipated impacts of the proposed project on local noise conditions

Air Quality Information and discussion of existing vs. anticipated impacts of the proposed project on local air quality conditions

Visual Anticipated impacts and compatibility of the proposed project on the existing environment including: design, siting of structures, heights, etc.

Historic Information and discussion of existing vs. anticipated impacts of the proposed project

on any historic resources

Archaeological *Information and discussion of existing vs. anticipated impacts of the proposed project on any archaeological resources*

Natural Features *Information and discussion of existing vs. anticipated impacts of the proposed project on the following environmental natural features:*

1. *Water resources*
2. *Flood plains management*
3. *Wetlands protection*
4. *Coastal zone management*
5. *Unique features: slope, erosion, soils, sand dunes, etc.*
6. *Vegetation and animal life (flora and fauna)*
7. *Open space*

Hazards *Information and discussion of existing vs. anticipated impacts of the proposed project on the following potential environmental hazards:*

1. *Tsunami (if applicable)*
2. *Nuisances and site safety*
3. *Toxic waste*
4. *Airport clear zone (APZ)*
5. *Other (Chemical, etc.)*

Required maps: *Necessary support maps indicating information on any of the above environmental features related to the development of the proposed project site*

Section VIII. Alternatives Considered

Section IX. Proposed Mitigation Measures

Section X. List of Agencies Consulted

Section XI. Summary Sheet (see attached form)

DGP REF. NO.:
MAP REF. NO.:
NB AREA:
AREA:
TMK:

(DP AREA)
DEVELOPMENT PLAN LAND USE AMENDMENTS
BEING CONSIDERED

Amendment/Project Information

Amendment Request:

Location:

Address(s) of Subject Area--Where Applicable:

Owner/Developer: Requested By:

Basis for Request:

Type of Project:

Impact on Provision of Housing:

Existing Conditions

Land Use:

Structures

Number:

Type:

Height:

ALISH:

Soil Features:

Possible Constraints:

Present Plan/Zoning Designations

State Land Use:

DP Public Facilities Map:

DP Special Provisions:

Zoning:

Section XII. Additional Application Requirements - Golf Courses

An application for a Development Plan Land Use Map amendment for any golf course proposal, including expansion or reconfiguration of any existing courses must include information and discussion of the following criteria (additional requirements are detailed in Section 24-1.15. of the Development Plan Common Provisions related to Golf Course Development):

Social and growth	*DP Common Provisions: Section 24-1.15.(b)(1)*
Economic	*DP Common Provisions: Section 24-1.15.(b)(2)*
Environmental Quality	*DP Common Provisions: Section 24-1.15.(b)(3)*
Community Integration	*DP Common Provisions: Section 24-1.15.(c)*

Section XIII. Notification Requirements

Affected neighborhood and area residents must be notified of the applicant's intent to amend the Development Plan Land Use Map. The applicant shall attach a list of the following parties and furnish each with a copy of the Summary Sheet and, a project location and project land use maps of the proposed development:

Property Owner(s), Lessee(s), Sub-Lessee(s) and Residents of the Property Being Proposed for Redesignation and of each Abutting Parcel, Pertinent Neighborhood Board(s) and Community Associations

Name:
Address:
Telephone:

Notify the recipients to forward any comments to the:

Planning Department
650 South King Street 8th Floor
Honolulu, Hawaii 96813

Include the following certification:

"Ordinance 84-111 states: No application for Development Plan Land Use Map amendment shall be accepted for processing unless the applicant notifies, by mail, all owners, lessees, sub-lessees and residents of the affected property and of each abutting parcel.

I hereby certify that I have complied with the notification requirements of Ordinance 84-111.

_____"
(Signature of Applicant)

EXHIBIT 2

Pre-Assessment Consultation/Notification Letter

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO

11000
Ser N4(203A)/7024
26 JAN 1994

Mr. David W. Rae
Manager, Community and Government Services
1001 Kamokila Boulevard
Kapolei, HI 96707

Dear Mr. Rae:

PROPOSED LAULANI 20-ACRE COMMERCIAL SITE
TMK: 9-1-69:5 (POR)

In response to your letter of December 20, 1993, we have no comment.

Thank you for the opportunity to review the proposal. Our point of contact is Mr. Stanford Yuen of the Facilities and Environment Department at 474-0439.

Sincerely,

M. D. CLAUSSEN
Commander, CEC, U.S. Navy
Deputy ACOS Facilities and Environment
By direction of
the Commander

WILLIAM
E.
WANKET
INC.
Land Use Consultant

March 8, 1994

Commander M. D. Claussen
Deputy ACOS Facilities and Environment
Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860-5020

Dear Commander Claussen:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your January 26, 1994 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate your letter and acknowledge that you have no comments on the proposal.

Sincerely,

WILLIAM E. WANKET

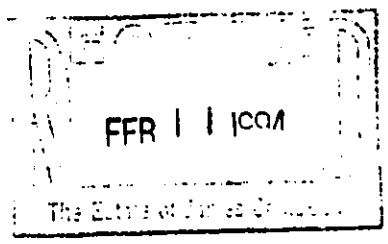
1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 50004
Honolulu, HI
96850-0001

February 9, 1994



Mr. David W. Rae
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Proposed Laulani 20-Acre Commercial Site TMK 9-1-69: 5 (POR)
Ewa, Hawaii

We have completed our review of the proposed project. We are concerned about the loss of prime agricultural land; however, we recognize that the area is surrounded by developed areas. We also recommend that an adequate erosion control plan be developed and monitored during project implementation. If feasible, the landscaping should incorporate constructed, best-management practices. Thank you for the opportunity to provide comments on this project. Should you have any questions, please contact Michael C. Tulang at (808) 541-2606.

NATHANIEL R. CONNER
State Conservationist

cc: Michael Bajingting, District Conservationist, Honolulu Field Office.

"To lead the way in helping our customers conserve, sustain, and enhance Hawaii's natural resources through efficient service of the highest quality."

WILLIAM
E.
WANKET
INC.
Land Use Consultant

March 7, 1994

Mr. Nathaniel R. Conner
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 50004
Honolulu, HI 96850-0001

Dear Mr. Conner:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your February 9, 1994 letter, responding to our request for preliminary comments on the above-referenced project. As your letter recommends, grading and erosion control plans will be prepared in compliance with pertinent ordinances and regulations. Landscaping of the site will be accomplished using constructed, best-management practices, if feasible.

Sincerely,

WILLIAM E. WANKET

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

U.S. Department
of Transportation
**Federal Aviation
Administration**

AIRPORTS DISTRICT OFFICE
BOX 50244
HONOLULU, HI 96850-0001
Phone: (808) 541-1243
Fax: (808) 541-3462

January 4, 1994

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolai, Hawaii 96707

Dear Mr. Rae:

We have received your December 20, 1993 letter regarding the proposed Laulani 20 acre commercial site in the Ewa area. We have no comments on the proposal but suggest you contact the State Department of Transportation, Airports Division for their input.

We appreciate the opportunity to comment on this proposal.

Sincerely,

David J. Welhouse

David J. Welhouse
Airport Engineer/Planner

Henry A. Sumida
Airports District Office Manager

cc: Owen Miyamoto w/letter

March 7, 1994

WILLIAM
E.
WANKET
INC.
Land Use Consultant

Mr. Henry A. Sumida
Airports District Office Manager
U.S. Department of Transportation
Federal Aviation Administration
Airports District Office
Box 50244
Honolulu, HI 96850-0001

Dear Mr. Sumida:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your letter of January 5, 1994, responding to our request for preliminary comments on the above-referenced project. We acknowledge that you have no comments on the proposal. Regarding your suggestion to contact the State Department of Transportation (DOT) Airports Division, the Director of DOT was among those receiving a letter requesting comments on the Laulani project.

Sincerely,

WILLIAM E. WANKET

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

JOHN WAIHEE
GOVERNOR OF HAWAII

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

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

March 7, 1994

In reply, please refer to:
93-361/epo

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Early Assessment
Laulani 20-Acre Commercial Site
Ewa, Oahu
TMK: 9-1-69: 5 (Por.)

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Air Pollution

There is a significant potential for fugitive dust emissions during the grading, excavation, and construction activities for this project because of the arid climatic conditions and the close proximity of newly developed and occupied residential subdivisions. Implementation of adequate dust control measures during all phases of construction is necessary. Construction activities must comply with provisions of Hawaii Administrative Rules, Chapter 11-60.1, "Air Pollution Control", Section 11-60.1-33, Fugitive Dust.

The contractor should provide adequate means to control dust from road areas and during the various phases of construction activities, including but not limited to:

a. planning the different phases of construction, focusing on minimizing the amount of dust generating materials and activities, centralizing material transfer points and onsite vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;

b. providing an adequate water source at site prior to startup of construction activities;

c. landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;

d. control of dust from shoulders, project entrances, and access roads;

e. providing adequate dust control measures during weekends, after hours, and prior to daily startup of construction activities;

f. providing dust control for bare areas on individual lots, prior to lots being sold and eventually grassed by future owners.

If you have any questions on this matter, please call Mr. Wilfred Nagamine, Chief of the Clean Air Branch at 586-4200.

Noise

1. Construction activities must comply with the provisions of Administrative Rules, Title 11, Chapter 43, "Community Noise Control for Oahu."

   a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the regulations.

   b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers.

   c. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and conditions issued with the permit.

2. Heavy vehicles travelling to and from the project site must comply with the provisions of Administrative Rules, Title 11, Chapter 42, "Vehicular Noise Control for Oahu."

3. Activities associated with commercial facilities must comply with the provisions of Administrative Rules, Title 11, Chapter 43, "Community Noise Control for Oahu."

Should there be any questions on this matter, please call Jerry Haruno, Environmental Health Program Manager, Noise and Radiation Branch at 586-4701.

Water Pollution

A National Pollutant Discharge Elimination System (NPDES) permit is required for any discharge to waters of the State including the following:

1. Storm water discharges relating to construction activities for projects equal to or greater than five acres;

2. Storm water discharges from industrial activities;

3. Construction dewatering activities;

4. Cooling water discharges less than one million gallons;

5. Ground water remediation activities; and

6. Hydrotesting water.

Any person wishing to be covered by the NPDES general permit for any of the above activities should file a Notice of Intent with the Department's Clean Water Branch at least 90 days prior to commencement of any discharge to waters of the State.

Any questions regarding this matter should be directed to Mr. Denis Lau of the Clean Water Branch at 586-4309.

Solid Waste

The Department of Health recommends that the application for the Ewa Development Land Use Plan amendment include a discussion of solid waste management at the site. The developers should estimate the volumes of solid waste that will be generated, as well as discussing the mitigation efforts which will be undertaken to reduce those volumes, including spatial and operational requirements. The State of Hawaii, in the 1991 Integrated Solid Waste Management Act, formally established waste reduction goals of 25% by 1995 and 50% by the year 2000. Any new project in the state should incorporate waste minimization efforts into the design, construction and operation phases.

We recommend the developers allocate space for collection of recyclables generated at the development and consider setting aside a portion of the parcel for collection of community recyclables.

We encourage the developers to investigate the potential to use secondary resources (recycled materials) in the design and construction of the commercial site. Plastic lumber, local compost and crushed glass for asphalt are all available for use in the construction and maintenance of the facility. In fact, Act 213-92 formally establishes the State's commitment to using glasphalt for road paving projects.

If you should have any questions on this matter, please call Ms. Carrie McCabe of the Solid & Hazardous Waste Branch at 586-4227.

Wastewater

The subject project is located within the county sewer service system. As the area is sewered, the project must be connected to the public sewer.

The developer should work closely with the County to assure the availability of additional treatment capacity and adequacy for the project. Non-availability of treatment capacity will not be an acceptable justification for use of any private treatment works or individual wastewater system.

If you should have any questions on this matter, please contact Ms. Lori Kajiwara of the Wastewater Branch at 586-4290.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

c: Clean Air Branch
Clean Water Branch
Wastewater Branch
Noise & Radiation Branch
Office of Solid Waste Management

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 22, 1994

Mr. John C. Lewin
Director
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Lewin:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: por. 5

Thank you very much for your March 7, 1994 comment letter on the above-referenced project. Our response follows.

Air Pollution

Construction activities will comply with provisions of Hawaii Administrative Rules, Chapter 11-60.1, "Air Pollution Control", Section 11-60.1-33, Fugitive Dust. Further, dust control mitigation will include, as appropriate, the measures recommended in your letter.

Noise

Construction activities will comply with the provisions of Administrative Rules, Title 11, Chapter 43, "Community Noise Control for Oahu", Title 11, Chapter 42, "Vehicular Noise Control for Oahu", and Title 11, Chapter 43, "Community Noise Control for Oahu."

Water Pollution

A National Pollutant Discharge Elimination System (NPDES) permit will be applied for at the appropriate time.

Solid Wastes

The project is expected to generate solid wastes in the range of 1,900 tons/year to 2,300 tons/year. This estimate is based on the amount of solid wastes currently generated by similar developments such as the Ewa Beach Shopping Center and Kapolei Shopping Center.

The Estate of James Campbell does encourage and support recycling efforts. The recently opened Kapolei Shopping Center uses trash receptacles which separate recyclable materials. The Estate also supports the green waste operation in the James Campbell Industrial Park where landscaping and construction debris are recycled into

1001 Kamokila Blvd
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

compost. These current practices would continue to be part of the solid waste mitigation efforts of the developer. In addition, other waste minimization options, including those recommended in your letter, will be investigated in the design, construction and operation phases of the project.

Wastewater

It is intended that the project be connected to the public sewer system. An application for sewer connection will be submitted to the Department of Wastewater Management to verify treatment capacity and adequacy prior to construction of the project. Private individual treatment systems are not planned to be used for this project.

We appreciate your comments, and will continue to coordinate with your office as the project goes through the planning and zoning permit approval processes.

Sincerely,

WILLIAM E. WANKET

cc: Brian Suzuki - Planning Department

JOHN WAIHEE
GOVERNOR

REX D. JOHNSON
DIRECTOR

DEPUTY DIRECTORS
KANANI HOLT
JOYCE T. OMINE
AL PANG
CALVIN M. TSUDA

IN REPLY REFER TO:

HWY-PS
2.9790

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

January 14, 1994

RECEIVED
JAN 18
The Estate of James Campbell

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Proposed Laulani 20-Acre Commercial (Shopping Center) Site, Ewa, TMK: 9-1-69: por. 5

Thank you for your letter of December 20, 1993, requesting our comments on the proposed project.

A Traffic Impact Analysis Report (TIAR) should be prepared and submitted for our review and approval. The report should discuss future traffic growth on Fort Weaver Road, including planned developments in the area and the impact of traffic generated by the development. Roadway and access improvements to mitigate the project's impacts should be discussed. Pedestrian and bicycle traffic should also be discussed and impacts mitigated.

The TIAR should not assume that improvements called for in the Ewa Highway Master Plan are a given, unless there is assurance that proposed improvements will be provided.

Required roadway and access improvements must be provided at no cost to the State Department of Transportation and should conform to applicable design standards.

Plans for construction work within the State highway right-of-way must be submitted for our review and approval.

Sincerely,

Rex D. Johnson
Director of Transportation

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 22, 1994

Mr. Rex D. Johnson
Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Johnson:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Kay: 9-1-69: Por. 5
HWY-PS - 2.9790

Thank you very much for your January 14, 1994 letter, responding to our request for preliminary comments on the above-referenced project.

Regarding your comments on the project's traffic report, a Traffic Impact Assessment Report has been prepared by Pacific Planning & Engineering. The report discusses future traffic growth in the area due to approved planned developments. Traffic impacts with and without the project are discussed along with mitigative measures. The addition of the planned North-South Road (included in the Ewa Highway Master Plan) was investigated as an improvement measure. Although not specifically addressed in the report, roadway improvements will be designed into the project to facilitate pedestrian and bicycle accessways. Enclosed is a copy of the Traffic Impact Assessment Report.

All roadway and access improvements will conform to applicable design standards, and any work within the State highway right-of-way will be submitted to your office for review and approval.

Sincerely,

WILLIAM E. WANKET

cc; Brian Suzuki - Planning Department - w/o attachment

attachment

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

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 27, 1993

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Proposed Laulani 20-Acre Commercial Site

We have reviewed the proposed commercial site summary and location map transmitted through your letter dated December 20, 1993 and have the following comments to offer:

1) We confirm that the proposed approximately 20-acre commercial site, identified as TMK: 9-1-69: por. 5, is within the State Land Use Agricultural District.

   It is our understanding that a State Land Use District Boundary Amendment would be required for the proposed commercial site.

2) The proposed commercial site is in close proximity to areas that have been previously approved by the Commission. They include:

   a) LUC Docket No. A88-627/Gentry Development Company. Reclassification of approximately 673.5 acres from the Agricultural District to the Urban District on May 8, 1989.

   b) LUC Docket No. A89-651/Haseko (Hawaii), Inc. Reclassification of approximately 403.008 acres from the Agricultural District to the Urban District on October 17, 1990.

We have no further comments to offer at this time.

Thank you for the opportunity to provide comments on this matter. If you should have any questions in regards to these comments, please feel free to contact me or Leo Asuncion of my staff at 587-3822.

Sincerely,

for ESTHER UEDA
Executive Officer

EU:lra

WILLIAM
E.
WANKET
INC.
Land Use Consultant

March 7, 1994

Ms. Esther Ueda
Executive Officer
Land Use Commission
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813

Dear Ms. Ueda:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your December 27, 1993 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate receiving information on areas adjacent to the project and confirmation that the subject lands are currently within the State Land Use Agricultural District.

Sincerely,

WILLIAM E. WANKET

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

JOHN WAIHEE
GOVERNOR

BRIAN J. J. CHOY
Director

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

January 3, 1994

Mr. David W. Rae
Manager, Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae,

Subject: Proposed Laulani 20-Acre Commercial Site

Thank you for the opportunity to review and comment on the subject document. We have no comments at this time, except to advise that you consult with the City and County of Honolulu Planning Department to determine whether an Environmental Assessment or an Environmental Impact Statement will be required for the project.

Sincerely,

for Brian J.J. Choy
Director

March 7, 1994

WILLIAM
E.
WANKET
INC.
Land Use Consultant

Mr. Brian J. J. Choy
Director
Office of Environmental Quality Control
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your January 3, 1994 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate your advice on the project's consultation process.

For your information, your letter and this response will be included in the Final Environmental Assessment.

Sincerely,

WILLIAM E. WANKET

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

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)587-2846, 587-2800

FAX: Director's Office 587-2848
Planning Division 587-2824

Ref. No. C-497

February 8, 1994

Mr. David W. Rae
Manager, Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Subject: Laulani 20 - Acre Commercial Site

Dear Mr. Rae:

Thank you for your letter of December 20, 1993 notifying the Office of State Planning (OSP) that the Estate of James Campbell is currently in the process of amending the City and County of Honolulu's Ewa Development Plan Map from Agriculture to Commercial with the intention of developing a neighborhood commercial center and requesting an early assessment of the proposed project.

The proposed neighborhood commercial center will be developed on approximately 20 acres of land in Ewa currently in the State Agricultural district. It will contain 138,000 square feet of leasable space consisting of shops similar to other neighborhood commercial centers such as a supermarket, drug/variety/hardware stores, specialty shops, and eating establishments. Approximately 750 parking stalls will be needed to fulfill parking requirements.

OSP prefers that the proposed neighborhood commercial center be part of a master plan rather than a spot zoning proposal surrounded by Agricultural lands. The location is consistent with OSP's recommendation in the State Land Use District Boundary Review Report: Oahu directing urban growth to the Ewa Plain.

Thank you for the opportunity to comment. Should you have any questions or comments, please contact Robyn Loudermilk of the Land Use Division at 587-2889.

Sincerely,

Harold S. Masumoto
Director

cc: Esther Ueda, Land Use Commission

WILLIAM
E.
WANKET
INC.
Land Use Consultant

March 17, 1994

Mr. Harold S. Masumoto
Director
Office of State Planning
P.O. Box 3540
Honolulu, Hawaii 96811-3540

Dear Mr. Masumoto:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your February 8, 1994 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate the information that the project's location is consistent with your office's recommendation in the *Land Use District Boundary Review Report: Oahu* directing urban growth to the Ewa Plain. For many years, the site has been designated for commercial use on the Estate of James Campbell's Ewa Master Plan, which also specifies the surrounding lands for residential use. Proposals for this latter use continue to be considered.

Again, thank you very much for your comments.

Sincerely,

WILLIAM E. WANKET

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

January 26, 1994

Mr. David W. Rae, Manager
Community and Government Services
Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Your Letter of December 20, 1993 Regarding the Proposed Development Plan Amendment for Laulani 20-Acre Commercial Site, TMK: 9-1-69: Por. 5

Thank you for the opportunity to comment on the proposed Development Plan Amendment. We have no objections to the proposed amendment.

We have the following comments:

1. The proposed water requirements should be coordinated with the Ewa Plains Water Development Corporation (EPWDC). The applicant will be required to obtain a water allocation from EPWDC for source, transmission, and storage capacities.

2. The applicant will be required to install the necessary on-site water system improvements to serve the development. The availability of water will be confirmed when the building permit is submitted for our review and approval.

3. All nonpotable water facilities should be installed and adequately labeled according to current BWS standards. The development should utilize xeriscape techniques for landscaping.

4. The installation of approved reduced pressure principle backflow prevention assemblies are required for all domestic water services. The backflow prevention assemblies should be located immediately after the property valves and prior to any branch piping.

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

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Manager and Chief Engineer

cc: Planning Department

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 21, 1994

Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Hayashida:

RE: Proposed Laulani Commercial Site - Ewa
Tax May Key: 9-1-69: Por. 5

Thank you very much for your January 26, 1994 letter, responding to our request for preliminary comments on the above-referenced project.

We appreciate the comment that your office has no objections to the proposed amendment. The applicant will coordinate with the Ewa Plains Water Development Corporation and your office, and all water improvements will be designed to meet applicable standards and requirements.

Again, thank you very much for your comments.

Sincerely,

WILLIAM E. WANKET

cc: Planning Department

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

DEPARTMENT OF HUMAN RESOURCES
CITY AND COUNTY OF HONOLULU
STANDARD FINANCE BUILDING
715 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813 • (808) 527-5311

FRANK F. FASI
MAYOR

VICTOR D. GUILLERMO, JR
DIRECTOR

DEPUTY DIRECTOR
EM

January 10, 1994

Mr. David W. Rae, Manager
Community and Government Services
The State of James Campbell
1001 Kamokila Boulevard
Kapolei, HI 96707

Dear Mr. Rae:

Subject: Proposed Laulani 20-Acre Commercial Site
TMK: 9-1-69:5 (POR)

This is to acknowledge receipt of your letter dated December 20, 1993 requesting our comments on the neighborhood commercial center development proposed by the Estate of James Campbell at TMK: 9-1-69:5 (POR).

We do not have any comments to offer at this time but reserve the right to make comments at a later date as additional information is provided on the proposed project.

Accordingly, we ask for our department's further involvement as the project continues to evolve.

Thank you.

Sincerely,

Victor D. Guillermo, Jr.
Director

VDG:dss

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 22, 1994

Mr. Victor D. Guillermo
Director
Department of Human Resources
Standard Finance Building
715 South King Street, 2nd Fl.
Honolulu, Hawaii 96813

Dear Mr. Guillermo:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your January 10, 1994 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate your letter and acknowledge that you have no comments on the proposal at this time. We look forward to your further involvement as the project continues through the planning ans zoning permit processes.

Sincerely,

WILLIAM E. WANKET

cc: Brian Suzuki - Planning Department

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR

ALVIN K.C. AU
DEPUTY DIRECTOR

January 7, 1994

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Proposed Laulani Commercial Site - Ewa
Tax Map Key 9-1-69: Por. 5

We have no comments to offer on the proposal to develop a neighborhood commercial center in Ewa.

Thank you for the opportunity to comment on the proposal.

Sincerely,

For WALTER M. OZAWA, Director

WMO:ei

WILLIAM
E.
WANKET
INC.
Land Use Consultant

March 6, 1994

Mr. Walter M. Ozawa, Director
Department of Parks and Recreation
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Ozawa:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your January 7, 1994 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate your letter and acknowledge that you have no comments on the proposal.

Sincerely,

WILLIAM E. WANKET

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JAN 12

FRANK F. FASI
MAYOR

Kenneth E. Sprague
Acting DIRECTOR AND CHIEF ENGINEER
DEPUTY DIRECTOR

In Reply Refer to:
94-14-0020

January 11, 1994

Mr. David W. Rae
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Your Letter of December 20, 1993, Relating to a Development Plan Amendment and State Land Use Boundary Amendment for the Proposed Laulani 20-Acre Commercial Site, Preliminary Comment for DP Map Amendment, TMK: 9-1-69: Por. 05

We have reviewed your preliminary application and have the following comments:

ENGINEERING:

Submit Best Management Practices (BMPs) to reduce the impacts of post-development storm water flows on existing facilities. Should there be any questions, please call Chew Lun Lau at 527-5856.

Submit a drainage study with the application. Should there be any questions, please call Sumio Tano at 523-4756.

Vehicular access to the commercial center should be from roads constructed off Fort Weaver Road. Roadway reconstruction to commercial standards along a portion of Fort Weaver Road may be necessary to accommodate the increased traffic and pedestrian flow.

Access improvements conforming to the Americans with Disabilities Accessibility Guidelines should be provided at the project site as required.

Frontage improvements are required.

Adequate on-site parking should be provided. Should there be any questions, please call Faith Kunimoto at 527-5084.

REFUSE COLLECTION:

Refuse collection for this commercial development should be provided by private haulers. Should there be any questions, please call David Shiraishi at 527-5697.

Very truly yours,

KENNETH E. SPRAGUE
Acting Director and Chief Engineer

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 28, 1994

Mr. Kenneth E. Sprague
Director and Chief Engineer
Public Works Department
Municipal Office Bldg.,11th Fl.
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Sprague:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5
94-14-0020

Thank you very much for your January 11, 1994 letter responding to our request for preliminary comments on the above-referenced project. We offer the following in response.

Best Management Practices (BMPs)

Best Management Practices (BPMs) will continue to be developed as planning and design of the project progresses. At this time, it is anticipated that the major feature to be included in the BMPs will be the implementation of detention basins. The basins will be used to dampen the increase in runoff from the project, minimizing impacts to the makai properties.

Drainage

Our engineer, Mr. Craig Arakaki of Engineering Concepts, Inc., will coordinate with your office on the drainage requirements for the project.

Vehicular Access

Main vehicular access to the project site is planned to be from a roadway constructed off of Fort Weaver Road. Additional accesses off of Fort Weaver Road are being proposed as secondary accesses, limited to right-turn ins and right-turn outs only. Improvements to Fort Weaver Road segments approaching both sides of the intersection of the roadway serving the Laulani parcel was anticipated and has been included in our plans.

Improvements

All improvements, including roadway frontage improvements, will be submitted to your office for review and approval. All improvements, including onsite parking, will meet the requirements of the Land Use Ordinance and the standards of the applicable government agencies.

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

Refuse Collection

Refuse collection for the project will be by private haulers.

Again, thank you for your comments.

Sincerely,

William E. Wanket

cc: Brian Suzuki - Planning Department

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

JOSEPH M. MAGALDI JR
DIRECTOR

AMAR SAPPAL
DEPUTY DIRECTOR

TE-5022
PL93.1.497

February 2, 1994

Mr. David W. Rae
Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Laulani Commercial Site
Development Plan Amendment Proposal
TMK: 9-1-69: Portion of 5

This is in response to your letter dated December 20, 1993 requesting our assessment of the proposed project.

We have no objections to the proposed Development Plan (DP) Amendment to develop a neighborhood commercial center. As discussed with the civil engineering staff retained by Campbell, it appears that the proposed roadway fronting this development can adequately service the anticipated traffic. A roadway master plan for the area should be provided, if available, with the documentation for DP amendment. The roadway master plan should show the surrounding land uses and the widths and cross-sections of the proposed roadway system. Since this commercial site will front a major roadway, the location and anticipated use of the driveway are considered critical and should be shown on the preliminary plans for this project.

Should there be any questions, please contact Mel Hirayama of my staff at 523-4119.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

WILLIAM
E.
WANKET
INC.
Land Use Consultant

March 7, 1994

Mr. Joseph M. Magaldi, Jr.
Director
Department of Transportation Services
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Mr. Magaldi:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your February 2, 1994 letter, responding to our request for preliminary comments on the above-referenced project. Enclosed for your information, is a copy of the Draft Environmental Assessment (DEA) prepared for the project, which contains a Traffic Impact Assessment Report by Pacific Planning and Engineering.

We will include your letter and this response in the Final EA that is currently being prepared. Again, thank you very much for your comments.

Sincerely,

WILLIAM E. WANKET

Encl

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

KENNETH M. RAPPOLT
DIRECTOR

FELIX B. LIMTIACO
DEPUTY DIRECTOR

WPP 94-13

January 11, 1994

Mr. David W. Rae
Manager, Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Subject: Laulani 20-Acre Commercial Site TMK: 9-1-69:5(POR)

We have reviewed your letter of December 20, 1993 regarding the proposed development of a neighborhood commercial center in the Ewa area. Presently, there are no sewers at the site of the proposed commercial center and the City has no plans to construct the necessary infrastructure. A sewage pump station may be required to transport sewage from the proposed site to the City's 84" sewer on Geiger Road.

If you have any questions, please call Tessa Yuen of the Planning Section at 527-6732.

Very truly yours,

KENNETH M. RAPPOLT
Director

March 7, 1994

WILLIAM
E.
WANKET
INC.
Land Use Consultant

Mr. Richard Seto-Mook
Acting Fire Chief
Honolulu Fire Department
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Dear Chief Seto-Mook:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your January 4, 1994 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate the information that area fire protection is adequate to serve the project. Accessways, water supplies, and building construction will conform to existing fire codes and standards.

Sincerely,

WILLIAM E. WANKET

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

FRANK F. FASI
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE BS-LK

January 7, 1994

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

This is in response to your request for comments on an application to amend the Ewa Development Land Use Map.

The project is expected to have no significant impact on police services, assuming that traffic, air quality, and noise problems are appropriately mitigated during construction. We have no additional comments to make at this time.

Thank you for the opportunity to review this document.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By Eugene Uemura
EUGENE UEMURA
Assistant Chief of Police
Administrative Bureau

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

FRANK F. FASI
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE BS-LK

January 7, 1994

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

This is in response to your request for comments on an application to amend the Ewa Development Land Use Map.

The project is expected to have no significant impact on police services, assuming that traffic, air quality, and noise problems are appropriately mitigated during construction. We have no additional comments to make at this time.

Thank you for the opportunity to review this document.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By Eugene Uemura
EUGENE UEMURA
Assistant Chief of Police
Administrative Bureau

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 22, 1994

Mr. Kenneth M. Rappolt
Director
Department of Wastewater
Management
Municipal Office Building
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Rappolt:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your January 11, 1994 letter, responding to our request for preliminary comments on the above-reference project. We appreciate the information on the status of sewers in the area, and understand that a sewage pump station may be required to pump the project's wastewater to the sewer main in Geiger Road. We will continue to coordinate with your office on the wastewater requirements. An application for sewer connection will be filed with your office once the necessary permit approvals have been received.

Sincerely,

WILLIAM E. WANKET

cc: Brian Suzuki - Planning Department

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

FRANK F. FASI
MAYOR

DONALD S M CHANG
FIRE CHIEF

RICHARD R SETO-MOOK
FIRE DEPUTY CHIEF

Ltr. from Wanket
File Laulani 5 C

January 4, 1994

Mr. David W. Rae, Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Rae:

Proposed Laulani 20-Acre Commercial Site
TMK: 9-1-69: 5 (POR)

We have reviewed the application for the above subject. Fire protection services provided from Ewa and Waipahu engine companies with ladder service from Waipahu are adequate.

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

Thank you for the opportunity to comment on the project.

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

DONALD S. M. CHANG
Fire Chief

AKL:ny

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 22, 1994

Mr. Eugene Uemura
Assistant Chief of Police
Administrative Bureau
Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Uemura:

RE: Proposed Laulani Commercial Site - Ewa
Tax Map Key: 9-1-69: Por. 5

Thank you very much for your January 7, 1994 letter, responding to our request for preliminary comments on the above-referenced project. During construction of the project, we will comply with all State and City requirements and mitigation, where necessary, will be implemented to offset any traffic, air quality and/or noise problems.

Sincerely,

WILLIAM E. WANKET

cc: Brian Suzuki - Planning Department

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

THE MYERS CORPORATION

Janaury 27, 1994

Mr. David W. Rae
Manager
Community and Government Services
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, HI 96707

RE: Proposed Laulani 20-Acre Commerical
TMK: 9-1-69: 5 (POR)

Dear David:

Thank you for your recent letter requesting our comments on your proposed commercial development in Ewa. Your development plans for this area appear to be very thoughtful and sensitive to the surrounding community. From our own development experience with the Hawaii Prince Golf Course, I know how important commerical development is and how much it is needed in the Ewa area.

We have no further comments to make at this time, except to let you know that we are wholly supportive of your efforts.

We wish you every success throughout the DP Amendment process. If we can be of further assistance, please let us know.

Very truly yours,

THE MYERS CORPORATION

Jack E. Myers
Chairman and CEO

JEM/jdj

Amfac Center, Hawaii Building, 745 Fort Street, Suite 1500, Honolulu, Hawaii 96813, (808) 521-9400, Fax (808) 521-4439

WILLIAM
E.
WANKET
INC.
Land Use Consultant

March 17, 1994

Mr. Jack E. Myers
Chairman and CEO
The Myers Corporation
Amfac Center, Hawaii Building
745 Fort Street, Suite 1500
Honolulu, Hawaii 96813

Dear Mr. Myers:

RE: Proposed Laulani 20-Acre Commercial
TMK: 9-1-69: 5 (por.)

Thank you very much for your January 27, 1994 letter, responding to our request for preliminary comments on the above-referenced project. We appreciate your expressions of support and assistance on the processing of our proposal.

Again, thank you very much for your comments.

Sincerely,

WILLIAM E. WANKET

Suite 320
1001 Kamokila Blvd.
Kapolei, HI 96707
Phone
(808) 674-3517

EXHIBIT 3

Draft Environmental Assessment
Comments and Responses

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

ROBIN FOSTER
CHIEF PLANNING OFFICER

ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

MAR 0 1994

BS 12/93-2835

March 7, 1994

The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Attention: David W. Rae, Manager
Community and Government Services

Gentlemen:

Comments to Draft Environmental Assessment (DEA)
for the Proposed Laulani 20-Acre Commercial Site,
TMK: 9-1-69: 5 (Por), Ewa, Oahu

In response to the subject proposed project for a 20-acre Laulani commercial center, we are offering the following comments.

The proposed subject site is currently designated as Agriculture on our Development Plan Land Use Map for Ewa.

Our Development Plan Public Facilities Map for Ewa indicates future development of a proposed potable water line along Fort Weaver Road.

The 138,000 square feet of leasable building area and 750 parking stalls cited in your project description could be accommodated on less than 10 acres under B-1 zoning. Accordingly, the Final Environmental Assessment (FEA) should justify the use and need for the 20 acres requested.

The proposed site is surrounded by agricultural lands for which no use has been identified beyond 1996 when Oahu Sugar Company is expected to discontinue operations. The FEA should disclose Campbell Estate's plans for these lands and the relationship of the proposed commercial site to them. An explanation of the site's location and configuration should also be included.

The FEA should discuss and further elaborate on the relationship of the proposed project to other approved commercial projects in the immediate area. Specifically, the FEA should include a market analysis which establishes the demand for the proposed commercial center in relation to the existing Ewa Beach Shopping Center and the recently designated 11-acre Ewa by Gentry commercial site on Fort Weaver Road. In addition, the types of commercial uses and phasing of the project should be discussed.

The department is concerned with the potential traffic impacts of the proposed project on Fort Weaver Road and other Ewa roadways in the region. Specifically, the FEA should include a discussion on the relationship of the proposed project to the Ewa Highway Regional Master Plan. In addition, the report should discuss the need for project access to Fort Weaver via a project driveway and service driveway when four driveways are planned for the shopping center via the new proposed roadway.

The FEA should provide a more extensive discussion on potential drainage impacts from the project. How would runoff from the project be handled and would surface runoff from other off-site areas impact the proposed project area?

Thank you for the opportunity to comment on the subject project. Should you have any further questions on the matter, you may contact Brian Suzuki of our staff at 527-6073.

Sincerely,

ROBIN FOSTER
Chief Planning Officer

RF:js

WILLIAM
E.
WANKET
INC.
Land Use Consultant

April 28, 1994

Mr. Robin Foster
Chief Planning Officer
Planning Department, 8th Fl.
Municipal Office Bulding
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Foster:

RE: COMMENTS TO DRAFT ENVIRONMENTAL ASSESSMENT
PROPOSED LAULANI 20-ACRE COMMERCIAL SITE

Thank you very much for your March 7, 1994 comment letter on the proposed Laulani Commercial site. We appreciate your comments, and offer the following in response.

Twenty (20) Size

The shopping center site plan included in the Draft Environmental Assessment (DEA) illustrates the need for the 20-acres. The site plan incorporates substantial landscape areas and setbacks from streets, wide interior walkways, individual building pads, and a separate behind the buildings service roadway. These design features contribute to the need for the 20-acres. This design is similar to the recently completed Kapolei Shopping Center that is developed on about 20-acres with less leasable building area than the proposed Laulani Commercial Center.

Surrounding Agricultural Lands

Campbell Estate's Kapolei Area Long Range Master Plan shows the project site and surrounding lands for future residential and commercial development. Proposals for the development of the surrounding lands continue to be considered. In fact, these lands, known as Laulani/Fairways, were proposed for development by the City and County of Honolulu, Department of Housing and Community Development (DHCD) as a housing and commercial project. The commercial component of that project was in the general area of the proposed Laulani Commercial site. Fairways, just east of the commercial site, is still under DHCD's consideration for a housing project.

Site Location/Configuration

Traffic, noise, and land use consideration were key factors in determining the location and configuration of the proposed commercial site.

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Market Study

A market study by The Hallstrom Group was performed and included in the DEA. The market study concluded that the 20-acre site is appropriately located and justified by market indicators, and would be a prudent addition to the regional land use inventory.

The DEA also described generally the type of uses expected to locate in the shopping center. Although specific tenants have not been selected at this early stage, the center is expected to attract 2-major tenants (usually a supermarket and a variety/drug stroe), along with smaller retail and specialty shops, restaurants, and other commercial activity that would be permitted in the applicable zoning district. Further, the DEA included a development schedule that estimated the center could be completed in 1998.

Traffic

The Traffic Impact Assessment performed by Pacific Planning and Engineering and included in the DEA addresses the impact on Fort Weaver Road, and concluded that Fort Weaver Road is expected to worsen due to continued development of the Ewa area, regardless of the commercial project. This was taken into consideration in the orientation of the commercial site, where the main vehicular access to the center is to be from a roadway constructed off of Fort Weaver Road.

In the Ewa Region Highway Master Plan, the project had previously been planned as part of the DHCD's Laulani/Fairways project which had residential developments as its major land use. The proposed Laulani 20-acre Commercial site would not add more traffic on Fort Weaver Road than what was considered in the Master Plan.

The project driveways from Fort Weaver Road provides an alternate route for drivers to access the project (right-turns only). This serves to disperse traffic from the main intersection, which in turn lessens the traffic congestion. The service driveway provides easier access for trucks, vans, etc. to enter without having to go around the entire project to reach businesses located near Fort Weaver Road, saving fuel and unnecessary delivery time.

Drainage

The proposed project would experience very little runoff from offsite areas. It is anticipated that the surrounding Laulani development will include an underground drainage system installed in accordance with the standards of the City and County of Honolulu Department of Public Works.

Runoff from the project site will be collected by an onsite underground collection system, ultimately discharging to a main drainage system serving the entire Laulani development. The drainage system for the commercial development is planned

to include catchbasins/inlets and drainpipes within the private property, conveying collected runoff to a public system in the roadways adjacent to the commercial site. The public drainage system will be typical of a drainage system serving residential developments, and will include catchbasins, manholes, and drainpipes within dedicated public roadways.

The ultimate disposal point for all the runoff from the Laulani development, including the subject commercial area, is the realigned and improved Kaloi Gulch. A portion of the Laulani development has been reserved for the implementation of a major drainageway through the site. The drainageway will be located on the westerly end of the Laulani parcel and will connect the golf course/drainageway of the mauka Gentry project to the Ewa Marina project to the south. The Laulani drainageway will be designed to accommodate the peak runoff from the contributing mauka drainage basin as well as the runoff from the Laulani development. Runoff generated offsite of the Laulani parcel will enter the project through this drainageway. The adjacent Ewa by Gentry project, for example, has been graded to prevent runoff from entering the Laulani site, except at the major drainageway.

Ultimately, the Ewa Marina project will be designed to accept the peak runoff from the mauka lands, including the Laulani parcel and subject commercial project. In the interim, detention basins are planned to dampen any increase in runoff resulting from the commercial development. The basins will be implemented in areas that are not planned to be developed in the near future. These basins will be kept in use until the makai drainage systems of Ewa Marina are in place and able to accommodate additional runoff from the Laulani parcel.

Again, thank you for your comments. The above responses will, as appropriate, be incorporated into the Final EA.

Sincerely,

William E. Wanket

WILLIAM
E.
WANKET
INC.
Land Use Consultant

May 13, 1994

Mr. Robin Foster
Chief Planning Officer
Planning Department
Municipal Office Bldg., 8th Fl.
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Foster:

RE: COMMENTS TO DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
PROPOSED LAULANI 20-ACRE COMMERCIAL SITE -
ADDITIONAL RESPONSE TO BS 12/93-2835

Enclosed is a letter from The Hallstrom Group in further response to your March 7, 1994 comment letter regarding the market study that was prepared for the proposed commercial project. The Hallstrom response is in reply to your comment concerning the recently DPed Ewa by Gentry commercial site

The response from the Hallstrom Group, and this letter, will be included in the Final EA.

Sincerely,

William E. Wanket

attachment

1001 Kamokila Blvd.
Kapolei Building
Suite 320
Kapolei, HI 96707
Phone
(808) 674-3517
Fax (808) 674-1064

THE HALLSTROM GROUP INC.

REAL ESTATE
CONSULTANTS
& APPRAISERS

James E. Hallstrom, Jr. MAI, SRA
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James S. Okata
Anne C. Rust
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Dana Zalewski
Christopher H. Grant
Fernando S. Bonacorsi

May 10, 1994

Mr. William E. Wanket
Land Use Consultant
Kapolei Building, Suite 320
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Proposed Laulani Commercial Development

Dear Mr. Wanket:

At your request we completed and forwarded a market study of the proposed Laulani commercial development to be located on approximately 20 acres owned by the Campbell Estate along Fort Weaver Road. Our report, dated January 3, 1994, was subsequently utilized in the preparation of a Draft Environmental Assessment (DEA) which was forwarded to the Planning Department of the City and County of Honolulu.

We have received a copy of a letter from Robin Foster, Chief Planning Officer with the City and County of Honolulu, which inquired about the proposed commercial use of a 10.5 acre Ewa by Gentry site.

While we considered the Gentry site in our study, the site was zoned for residential use (Ordinance 91-17) and not for commercial use (although general planned for commercial). It is our understanding that the original planned use for this site was residential, although Gentry has subsequently expressed a desire to develop commercial facilities on the Gentry site.

If utilized for commercial purposes and zoned B-1, our studies show that the site would not adversely impact the feasibility of the commercial space within the subject market area, but would only alleviate some of the demonstrated shortage.

ARBITRATION
APPLICATION AND
MARKET STUDIES

PACIFIC TOWER
SUITE 1400
1001 BISHOP STREET
HONOLULU
HAWAII 96813

TELEPHONE (808) 526-0866
FAX (808) 545-4369

Please contact us if you have any further questions or comments.

Respectfully submitted,

THE HALLSTROM GROUP, INC.

James E. Hallstrom, Jr., MAI, SRA

JEH/as/3461_L-1

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

JOSEPH M. MAGALDI, JR.
DIRECTOR

AMAR SAPPAL
DEPUTY DIRECTOR

TE-1249
PL94.1.083

April 25, 1994

Mr. William E. Wanket
William E. Wanket Inc.
Kapolei Building, Suite 320
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Wanket:

Subject: Laulani Commercial Site -- Ewa
Draft Environmental Assessment (EA)
Tax Map Key: 9-1-69: Portion 5

This is in response to your letter dated March 7, 1994 requesting our comments on the draft EA.

Based on our review, we have the following concerns:

1. All vehicular access points along the proposed access road should be constructed as standard City dropped driveways.

2. Driveway grades should not exceed 5 percent (5%) for a minimum distance of 35 feet from the curb line, and adequate sight distance to pedestrians and other vehicles should be provided and maintained.

3. The proposed driveway along the access road nearest to Fort Weaver Road should be located as far from the intersection as possible. Adequate stacking should be provided for vehicles on the access road to avoid queuing into the driveway.

4. We understand that the access road will connect to North-South Road and also service a residential area to the west. If this is the case, the traffic report should be updated to reflect these impacts.

5. A plan showing the surrounding land uses and the width and cross-section of the proposed access road should be provided to our office.

Should you have any questions, please contact Lance Watanabe of my staff at 523-4199.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

WILLIAM
E.
WANKET
INC.
Land Use Consultant

May 13, 1994

Mr. Joseph M. Magaldi, Jr.
Director - Department of
Transportation Services
Pacific Park Plaza 1200
711 Kapiolani Blvd.
Honolulu, Hawaii 96813

Dear Mr. Magaldi:

RE: Laulani Commercial Site - Ewa
Draft Environmental Assessment (EA)
Comment Letter - TE-1249 - PL94.1.083

Thank you very much for your April 25, 1994 comment letter on the above Draft Environmental Assessment. We appreciate your comments, and offer the following in response.

1. All driveways will conform to the requirements of the department. The project will be planned with drop driveways at the vehicular access points.

2. Due to the flat site, driveway grades are not anticipated to reach 5% in the driveways and parking lot. Provisions for adequate site distance will be incorporated in the design of the project's driveways.

3. All driveway locations and stacking laneage will be coordinated with your office, and designed and constructed to City requirements and standards.

4. The traffic report does not assume connection to the proposed North-South Road. The traffic report will be updated when plans for the remaining lands have developed to a point where impacts can be assessed, and a determination is made with respect to the possible connection to the North-South Road.

5. The land use for all of the area adjacent to the proposed access road is anticipated to be developed for residential. However, planning options for its development are still under review. As the planning of this area progresses, more detail information regrading the roadway will be forwarded to your department for review and approval.

Again, thank you for your comments. Your comment letter and this response will be included in the Final EA.

Sincerely,

William E. Wanket

cc: Brian Suzuki - Planning Department

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