DEPARTMENT OF GENERAL PLANNIN

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

RECEIVED
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OFC. OF ENVIRON. QUALITY CON.

BENJAMIN B. LEE
CHIEF PLANNING OFFICER

ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

RH/DGP 90/E-6

February 22, 1990

Mr. Tosh Hosoda
Gentry Development Company
P.O. Box 295
Honolulu, Hawaii 96809

Dear Mr. Hosoda:

Ewa Development Plan Land Use Map Amendment
Regarding the Ewa by Gentry Development,
TMK 9-1-10: Por. 2; 9-1-12: Por. 1, Por. 5,
Por. 30; DGP File No. 90/E-6

This is to inform you that your request to amend the Ewa Development Plan will be processed in the 1990 Annual Amendment Review. Your request for a development plan amendment was subject to an environmental assessment pursuant to Chapter 343, HRS, the State Environmental Impact Statement law. After a review of the amendment request, we have determined that an EIS will not be required for the proposed reconfiguration. The notice of negative declaration to the State Office of Environmental Quality Control is attached.

If there are any questions, please call Randy Hara at 523-4483.

Sincerely,

BENJAMIN B. LEE
Chief Planning Officer

BBL:lh

cc: √OEQC

1990-05-23-0A-FEA

*EWA by Gentry

DEVELOPMENT PLAN APPLICATION *

Gentry Development Company

January 1990

I. BACKGROUND

A. Essential Information

1. Applicant: Gentry Development Company

2. Landowner:

Gentry Development Company
The Estate of James Campbell

3. Request:

To amend the existing Development Plan for EWA Gentry in the following respects:

a. To realign and expand the proposed golf course from approximately 170 acres to 188 acres to accommodate increased drainage requirements;

b. To make adjustments between low density apartment and residential areas to accommodate the golf course realignment and to conform the development plan to the current site plan for the project; and

c. To relocate the proposed public elementary school site in accordance with the Department of Education's facilities plan.

4. Location:

The amendment areas are located within and contiguous to the Ewa Gentry development as shown on Exhibit A.

5. Addresses/Tax Map Keys:

9-1-10: Portion of 2
9-1-12: Portion of 1, Portion of 5 and Portion of 30.

6. Existing Land Use:

The amendment area consists predominantly of lands in sugarcane cultivation or fallowed sugarcane lands. Other existing uses include a 41-acre plant nursery operated by Living Designs, Inc., the 413-unit Soda Creek residential community and the 440-unit Palm Villas and Palm Court townhome communities.

7. State Land Use:

The entire development area is classified within the Urban District.

8. Development Plan Designation:

The Development Plan for Ewa was amended in February 1989 to permit development of 5,300 dwelling units at Ewa Gentry. The current DP land use map designations and approximate acreages are as follows:

Low Density Apartment	:	145 acres
Residential	:	310 acres
Park	:	198 acres
Public Facility	:	7 acres
TOTAL	:	660 acres

Approximately 60 acres of the proposed amendment area is designated Agriculture. The balance is designated in various Urban uses.

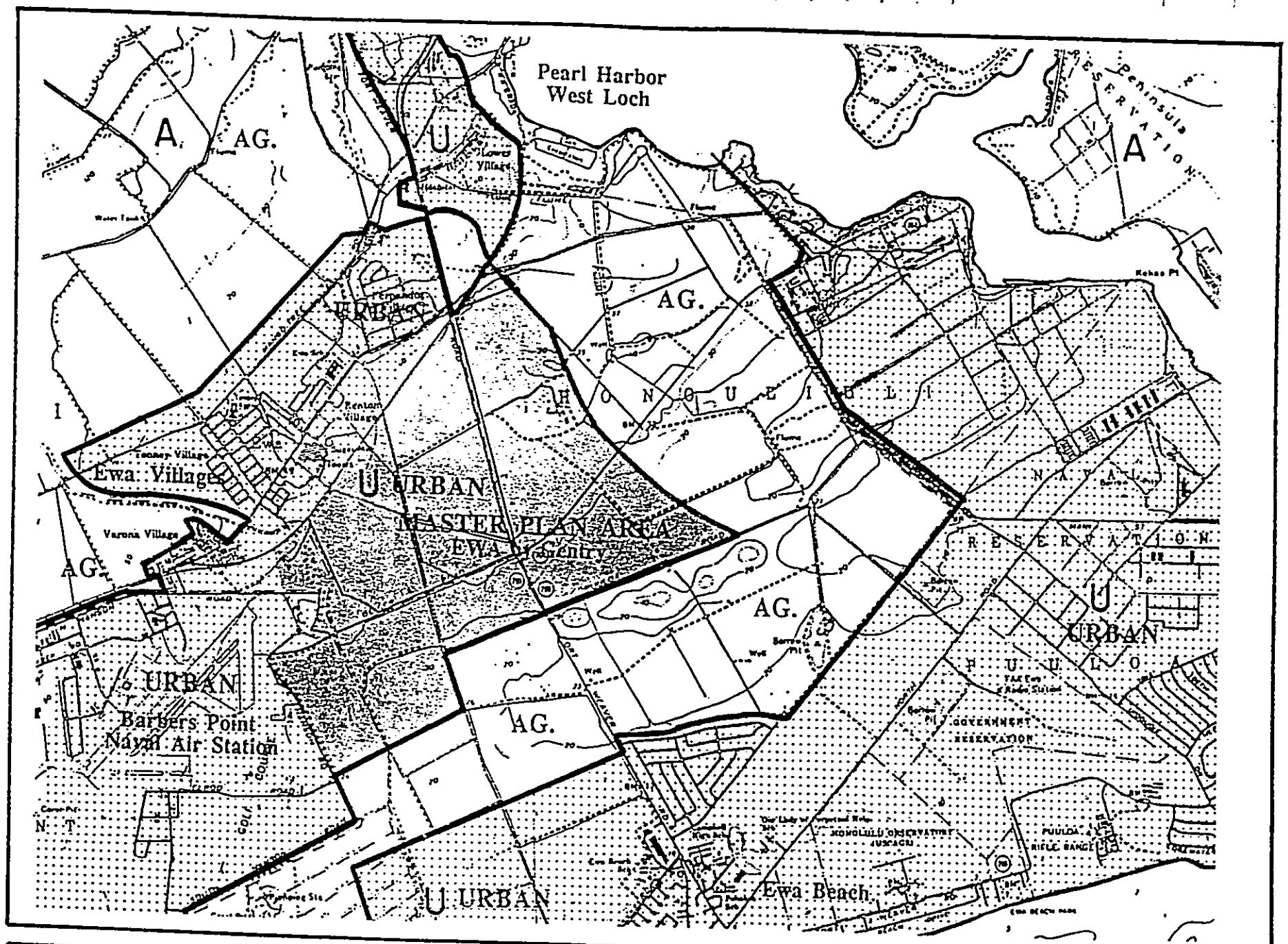
9. Zoning:

With the exception of 225 acres which received urban zoning designations in September 1984, the proposed amendment area is zoned for agricultural use. The current urban zoning designations and approximate acreages are as follows:

A-1	Low Density Apartment	:	145 acres
R-5	Residential	:	62 acres
P-2	General Preservation	:	18 acres
	TOTAL	:	225 acres

The applicant has applied for a zoning change to rezone approximately 660 acres in accordance with the adopted Development Plan.

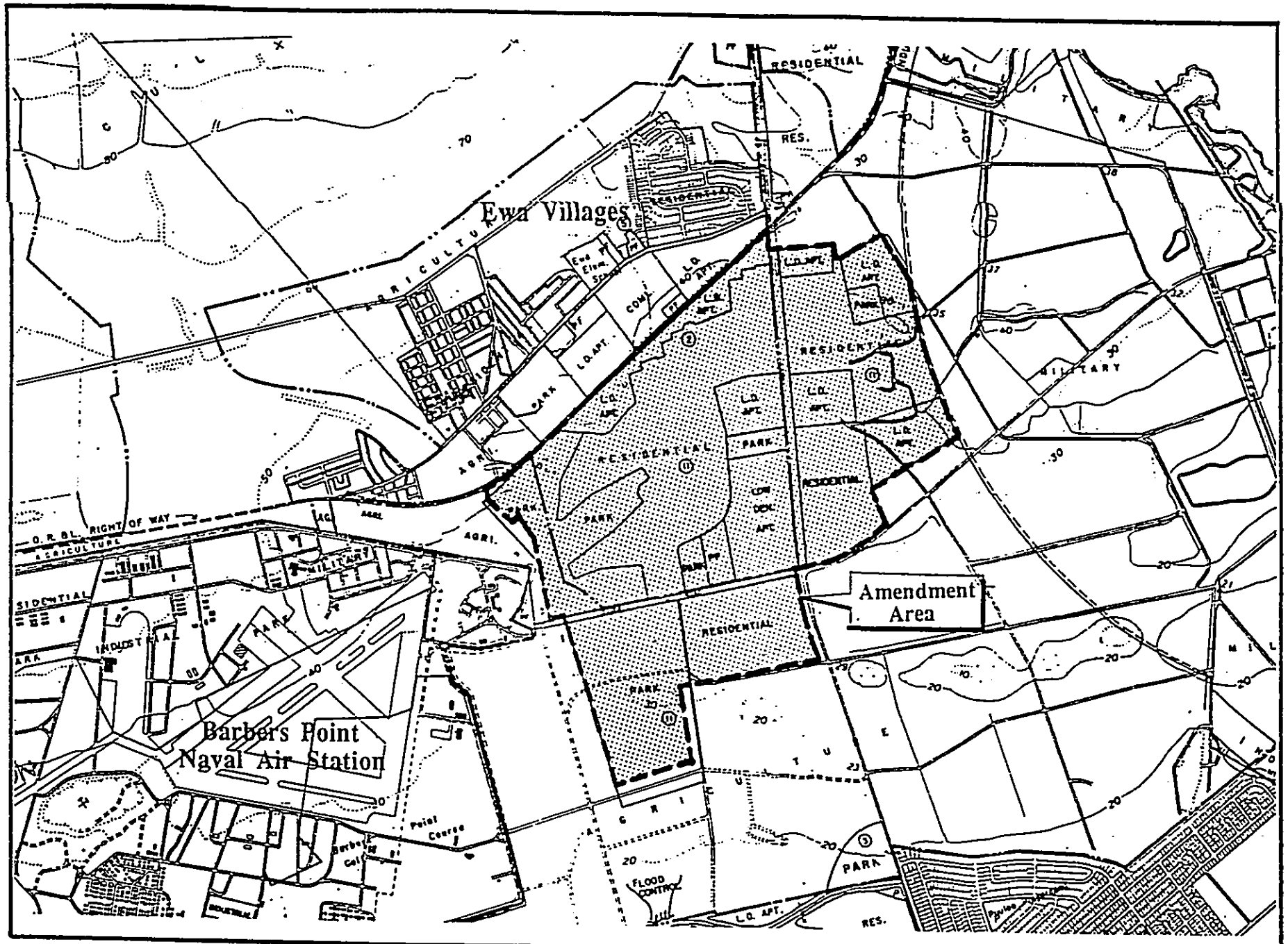
B. Description of the Property - The information requested in this section, e.g., property boundary, topography, slope, soils, etc., has been previously submitted for this project. Please refer to Development Plan amendment request dated December 1, 1987 and the Environmental Impact Statement for Ewa Gentry. A summary of environmental conditions is attached as Exhibit B.



EWA by Gentry

Honouliuli, Ewa, Oahu, Hawaii

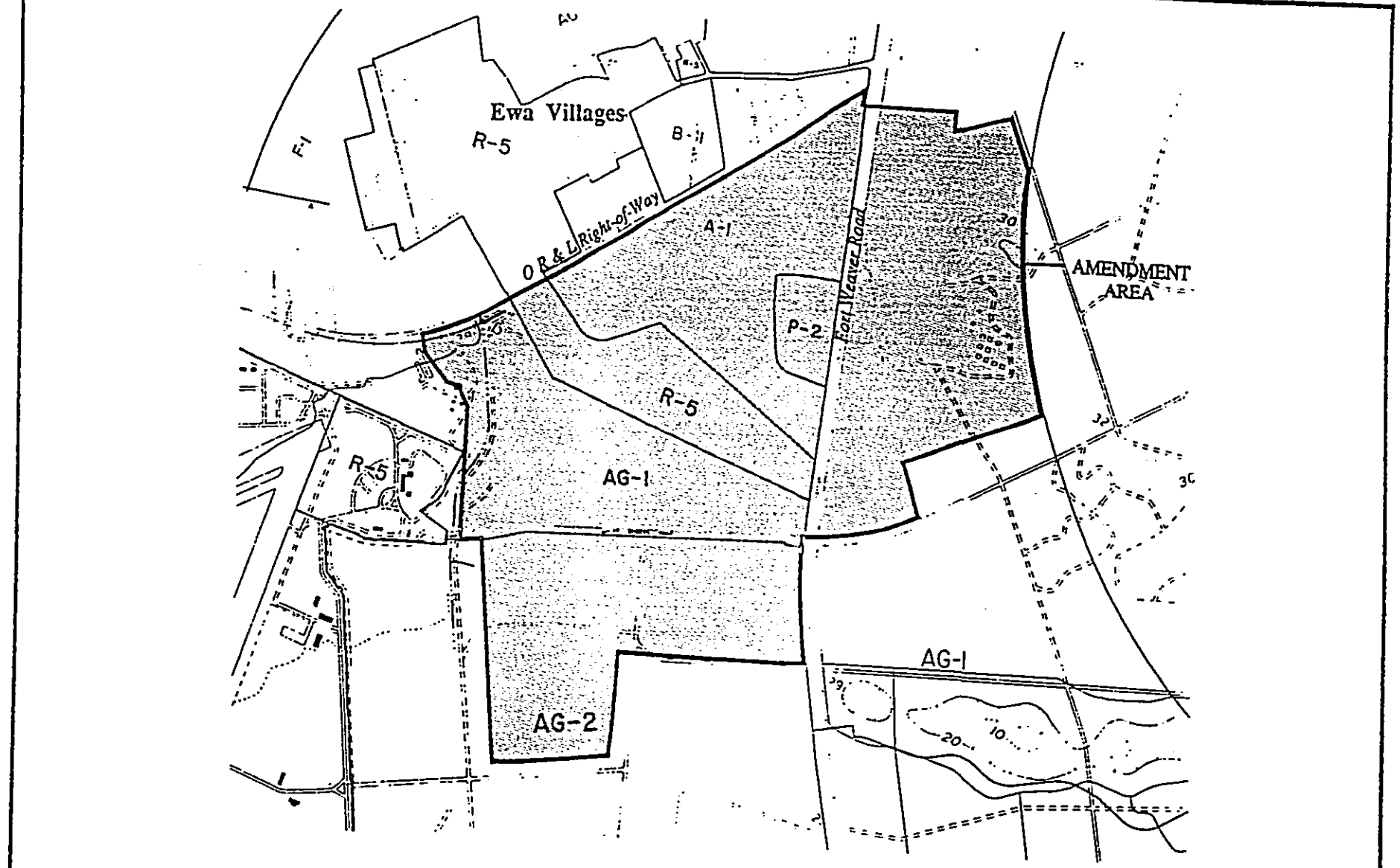
State Land Use
Boundaries



EWA by Gentry

Honouliuli, Ewa, Oahu, Hawaii

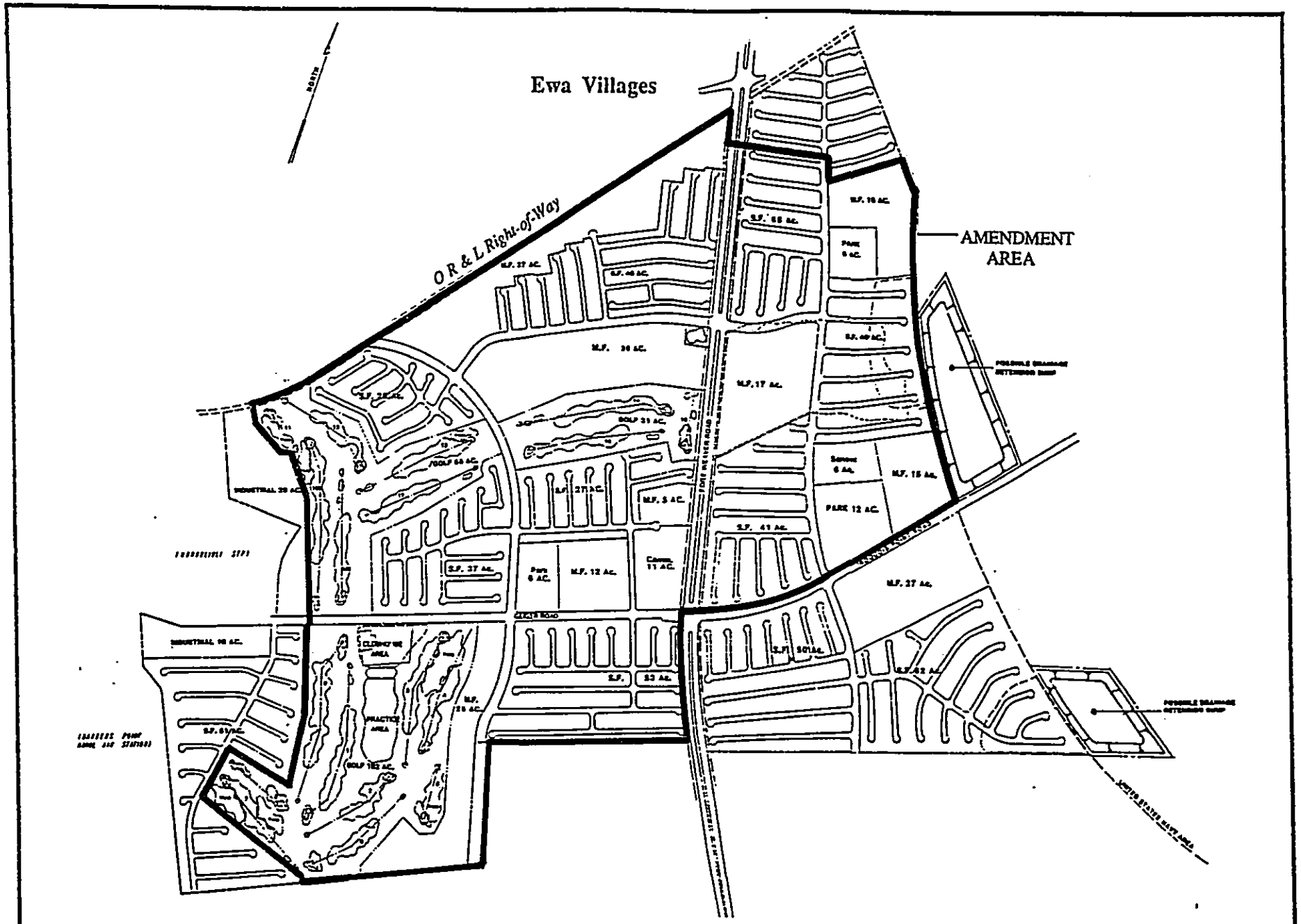
Ewa DP Land Use Map



EWA by Gentry

Honouliuli, Ewa, Oahu, Hawaii

Existing Zoning



EWA by Gentry

Honouliuli, Ewa, Oahu, Hawaii

AMENDMENT AREA

II. DEVELOPMENT PROPOSAL

A. Applicant's Proposed Use of Property

The applicant's proposal for Ewa Gentry is a planned residential community with necessary public support facilities and utilities. Gentry Development Company proposes to build 5,300 single-family and multi-family housing units and an 18-hole golf course within the amendment area. The applicant also proposes to set aside lands for public development of a new elementary school and community parks.

Since the 1988 Development Plan Annual Review, the master plan for Ewa Gentry has undergone several refinements in response to agency and public comments, as well as, more detailed planning information. These changes were prompted in large part by drainage requirements which necessitated realigning and expanding the proposed golf course and subsequent redesign of adjacent residential and low density apartment areas.

The purpose of this application is to amend the existing Ewa Development Plan to reflect the current master plan for Ewa Gentry. The net effect of this amendment proposal is redesignation of approximately 60 acres from agriculture to various urban uses and a return of 17 acres from Park to Agriculture. The redistribution of urban land use designations is as follows:

Low Density Apartment:	178 acres (+33)
Residential:	307 acres (- 3)
Park:	212 acres (+14)
Public Facility:	6 acres (- 1)
TOTAL:	703 acres (+43)

1. Residential Development

Although the revised master plan includes an additional 33 acres of Low Density Apartment lands, the applicant will not exceed the currently approved DP capacity of 5,300 dwelling units for the amendment area. Approximately 2,370 single-family dwelling units and 2,930 multi-family dwelling units are proposed.

The single-family units will be two, three and four bedroom homes on 2,600-4,000 square foot lots, with some larger lots planned primarily near the proposed golf course. Densities will range from 5-10 units per acre.

The multi-family units will consist of low-rise condominiums at densities ranging from 13 to 30 units per acre. The applicant may also develop and operate several projects as rental apartments.

Units prices will be based on market conditions at the time of sale. Based on 1990 market conditions, cost of labor and materials, financing and other factors, the average single-family home will sell for approximately $175,000 to $300,000. Some of the larger homes near the golf course will sell at higher prices. Multi-family units should sell between $75,000 to $200,000. A program for meeting affordable housing requirements will be developed in consultation with the Department of Housing and Community Development.

2. Recreation and Open Space

Gentry Development Company will dedicate approximately 24 acres of land for development of public parks within the amendment area. One six acre park site is proposed in the western half of the project near Geiger Road, and another is planned on the eastern side of Fort Weaver Road. A third 12-acre park is proposed to be located adjacent to the elementary school.

The applicant will be responsible for site preparation of the parks in compliance with Department of Parks and Recreation standards. The company also proposes to participate in the expansion and improvement of Ewa Mahiko District Park to fulfill park dedication requirements.

A 188 acre 18-hole golf course is planned as a major recreational feature of the project. The golf course will be located west of Fort Weaver Road and will incorporate the large land area required by the Kaloi Tributary and drainage system for the entire western half of the project area.

3. Access and Circulation

Fort Weaver Road bisects the project and will provide the primary access to Ewa Gentry. A second north-south road is planned to alleviate traffic on Fort Weaver Road and provide another major access to the development. The segment of roadway that traverses through the master plan area will be constructed by the applicant. The final roadway alignment outside Ewa Gentry has not yet been determined.

The project's circulation system will consist of arterials, major streets, collectors, local streets and cul-de-sacs. Arterials such as Fort Weaver Road and the new north-south road will serve to connect Ewa Gentry with the surrounding region. Major streets will facilitate intra-community travel and provide access to community facilities within the development. Collector streets will collect traffic from local streets in the neighborhoods and channel it into the major street system. Local streets and cul-de-sacs will be used primarily for access to abutting parcels and will serve local traffic only.

4. Development Schedule

Gentry Development Company proposes to construct the residential portions of the project over a 7 year period under the following schedule:

Year	Single-family	Multi-family	Total
1988	410	---	410
1989	---	440	440
1990	50	690	740
1991	580	580	1160
1992	470	420	890
1993	610	460	1070
1994	250	340	590
	2370	2930	5300

III. NEED FOR PROPOSED DEVELOPMENT

The social and economic basis for development of Ewa Gentry has been well substantiated by various public and private market studies. Attached as Exhibit C is a 1988 market assessment for the project commissioned by the applicant.

IV. FEDERAL, STATE AND CITY PLANS AND PROGRAMS INVOLVED

Please refer to attached Exhibit D for a discussion of the relationship to State and City Plans. There is no involvement with Federal plans or programs.

V. IMPACTS

Please refer to attached Exhibits E and F and the accepted EIS for a discussion of socio-economic conditions and public services and infrastructure.

VI. ENVIRONMENTAL IMPACTS

Please refer to attached Exhibit B and the accepted EIS for this project.

EXHIBIT A

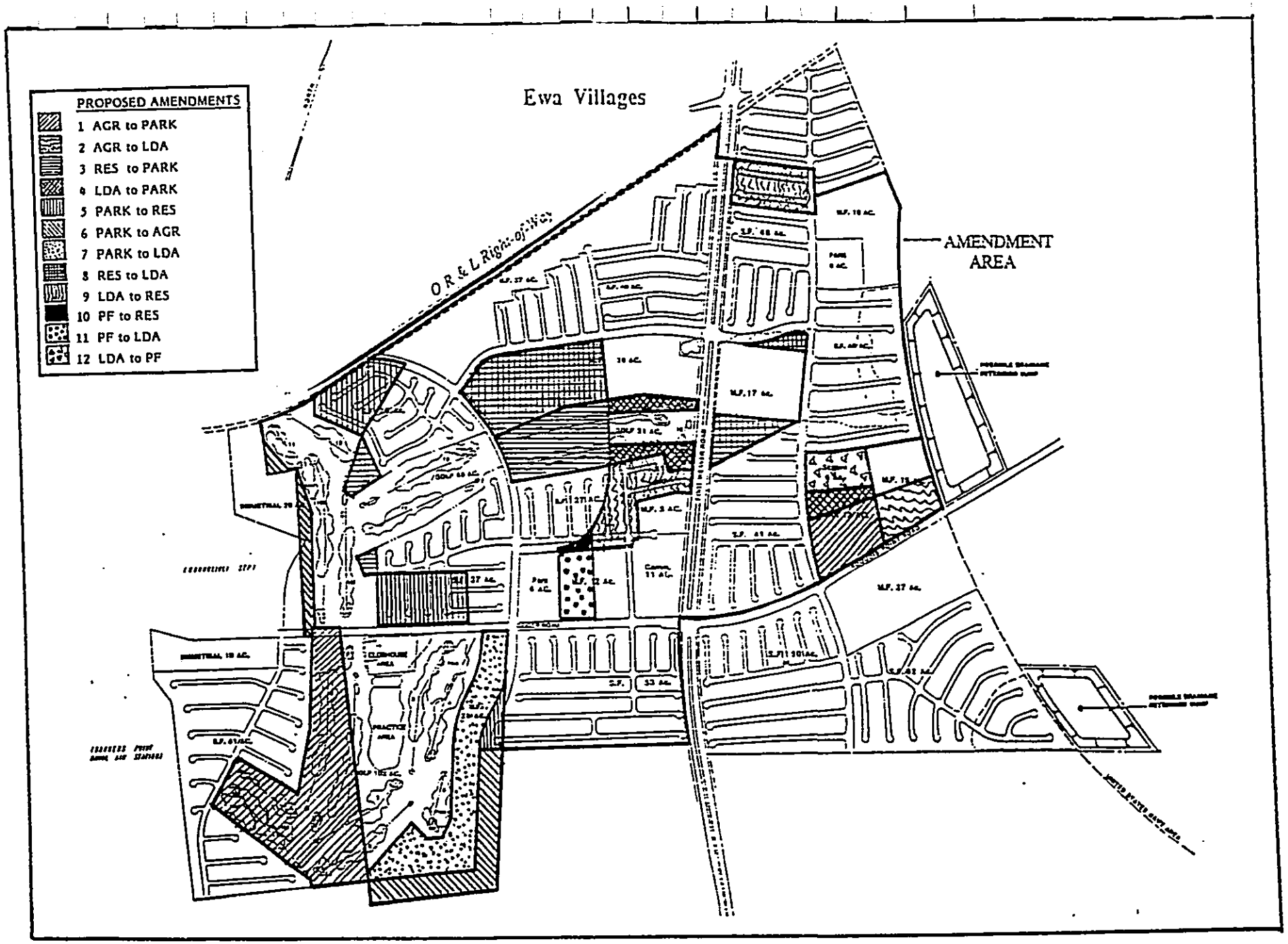


EXHIBIT A

EWA by Gentry

Honouliuli, Ewa, Oahu, Hawaii

PROPOSED AMENDMENTS

EXHIBIT B

EXHIBIT B

ENVIRONMENTAL CONDITIONS

ENVIRONMENTAL CONDITIONS

A. HISTORICAL LAND USES

The Ewa Plantation Company was established in 1890 and operated for the next 60-70 years, until rising production and labor costs coupled with international competition gradually reduced the company's profitability. Ewa Plantation Company was sold in 1970 and eventually merged with Oahu Sugar Company, Limited in 1971.

In 1974, the State Land Use Commission approved reclassification of 331 acres within the project area to the State Land Use Urban District. The Ewa Development Plan was amended in 1983 to redesignate 225 acres of the Urban area to Low Density Apartment, Residential and General Preservation designations. Rezoning in conformance with the adopted Development Plan followed in 1984.

In June 1987, Thomas H. Gentry and subsequently, Gentry Development Company, acquired 175 acres (TMK 9-1-12: 29, 30) of the amendment area in fee from Aloha State Corporation, a subsidiary of Hirano Brothers, Ltd., and began construction of the Soda Creek subdivision.

A Development Plan amendment request submitted by Gentry was approved by the City Council in February 1989 and provides for an expanded development area of approximately 660 acres to accommodate construction of 5,300 housing units.

On March 9, 1989, the State Land Use Commission approved reclassification of an additional 674 acres from the State Agricultural to the Urban District, for a total of 1,005 acres in the Urban District.

B. EXISTING USES

The EWA by Gentry master plan area is bordered by the Ewa Villages to the north and Ewa Beach to the south. Honouliuli Wastewater Treatment Plant and Barbers Point NAS are located west of the project and sugarcane fields are located to the east and west.

Within the amendment area, existing uses include the cultivation of sugarcane by Oahu Sugar Company on 300 acres, approximately 260 acres of fallowed sugarcane lands, a 41 acre plant nursery operated by Living Designs, Inc., and 413 single-family residences on 46 acres at Soda Creek. Construction of 440 low-rise condominiums and apartment units is also underway on 25 acres.

C. TOPOGRAPHY

The project area is generally level, with elevations ranging from approximately 40 feet above mean sea level on the site's northwestern boundary to approximately 20 feet above mean sea level on the southeastern boundary. The average ground slopes are less than one percent (1%).

D. FLOOD CONDITIONS

The Flood Insurance Rate map prepared by the U. S. Federal Emergency Management Agency has designated the project area as Flood Zone D, an unstudied area with possible flood hazards.

E. DRAINAGE

Existing Conditions

The project is divided into two separate drainage areas divided by Fort Weaver Road. Existing drainage facilities are inadequate to support the proposed development. North of Ewa Gentry, an existing drain carries runoff from Fernandez Village, Ho'Akea subdivision and the adjacent Ewa Elderly Housing site onto the project area.

The 7.8 square mile Kaloi Gulch watershed drains through a man-made channel on the west side of the project area and eventually discharges into the ocean. Oahu Sugar Company constructed the existing drainage channel which is inadequate to handle peak discharges. Storm water sheet flows over land in sugarcane cultivation and partially percolates through ground depressions.

The project area to the east of Fort Weaver Road has no defined drainage course other than existing sugar-cane irrigation ditches. This area has no natural drainage outlet to the ocean or to Pearl Harbor's West Loch.

Project Impact

Belt Collins and Associates has prepared a master drainage plan for Ewa Gentry which was approved by the Department of Public Works in April 1988. The plan consists of two independent area plans because the eastern and western portions of the project function as separate drainage basins. This plan is included as Appendix C in the EIS.

West of Fort Weaver Road

All on and off site drainage to the west of Fort Weaver Road will be directed toward a realigned and improved Kaloi drainage channel within the proposed golf course.

A golf course is the preferred solution to the Kaloi Basin drainage problem. The design of the Kaloi Gulch channel will be incorporated into the golf course, enabling the golf course to serve as a retention and conveyance element in the project's drainage system. The new grass-lined Kaloi channel will be constructed with sufficient conveyance capacity to handle the 100 year peak flow of approximately 10,400 cubic feet per second (cfs). Golf course lands on either side of the channel will contribute to this conveyance capacity.

Approximately 1.5 million cubic yards of material will be excavated from the golf course and Kaloi Channel and used to increase the elevation of adjacent residential properties. There will be sufficient freeboard to separate the lowest elevation of residential areas from the highest level of flow through the golf course and channel.

Runoff from the Ewa Villages, Fernandez Village, Ho'Akea subdivision and the Ewa Elderly Housing project will also be handled by this system.

East of Fort Weaver Road

On the east side of Fort Weaver Road, sumps capable of handling runoff volumes of a 100 year storm of up to seven days in duration will be excavated to contain flood waters. Material removed from the sumps will be used to increase the elevation of residential areas so that homes will be adquately protected from flooding.

The applicant intends to coordinate off site drainage improvements with adjacent landowners and developers including the Navy and Campbell Estate.

F. FAUNA

Andrew J. Berger conducted a survey of the master plan area to identify the types of birds and mammals on-site and the quality of the existing habitat. Dr. Berger's report, "Birds and Mammals of the Ewa Gentry Region," is included as Appendix E of the Environmental Impact Statement (EIS) for Ewa Gentry.

The project is not expected to have any adverse effects on the fauna in the area. The habitat of the entire Ewa region has been disturbed for well over 100 years. As a result, no endemic ecosystem is present within the project site. The only concern expressed in Dr. Berger's report is the prevention of possible runoff into the bird sanctuaries in the West Loch region of Pearl Harbor. However, the master drainage plan approved by the Department of Public Works proposes to contain all storm runoff in sumps excavated within the project area or on adjacent lands. Therefore, the potential of runoff into the bird sanctuaries is eliminated.

G. FLORA

Char and Associates conducted a survey to inventory and assess the botanical resources within the master plan area. Their report, "Botanical Survey, 'Ewa Gentry Residential Community, 'Ewa District, O'ahu", is included as Appendix D of the EIS.

The project is not expected to have a significant 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 project site and the Ewa Plain in general have been disturbed for a long period of time and most of the land actively cultivated.

The major portion of the land is actively under sugarcane cultivation by Oahu Sugar Company, with smaller acreages in seed corn production. The remaining acreages support weedy or ruderal vegetation. No remnant native plant communities or rare, threatened and endangered plants have ever been recorded from the Ewa Gentry project site.

H. ARCHAEOLOGICAL RESOURCES

Archaeological Consultants of Hawaii conducted an archaeological surface reconnaissance study of the master plan area and their report is included as Appendix F of the EIS. Their report stated that no above ground archaeological sites were located in the survey of the area and that related documents indicated subsurface recovery potentials would also be very limited, if non-existent. Historic plantation activities have contributed to the loss of any above ground structures which may have once existed there.

The Bishop Museum conducted an archaeological subsurface survey of the project area in June 1988, and found no evidence of prehistoric or early historic human settlement. In view of the archival and field data, the Museum recommended that no further archaeological work needs to be done for the project area. A copy of the Museum's report is available upon request from the applicant.

In the event that any archaeological resource is encountered during development of the project area, the applicant will stop work immediately and contact the State Historic Preservation Office.

I. AIR QUALITY

Existing Conditions

The State Department of Health maintains air quality data for selected locations on Oahu. Air quality information in the vicinity of the project area is collected at Barbers Point and Pearl City. Samples are limited to 24 hour samplings of particulate matter and sulfur dioxide once every six days. Table 1 lists the Federal and State of Hawaii ambient air quality standards for these pollutants.

Tables 2 and 3 summarize the data collected at the Barbers Point Station and the Pearl City Station for sulfur dioxide and particulate matter. Since 1979, the Hawaii standard for particulate matter concentration was exceeded only once, at the Barbers Point Station, in 1983. The particulate matter concentrations may have exceeded the State standards prior to 1986, but have been in compliance since 1986.

TABLE 1

FEDERAL AND STATE OF HAWAII AMBIENT AIR QUALITY STANDARDS

Pollutant(1)	Averaging Time	Hawaii Standards	Federal Standards Primary(2)	Federal Standards Secondary(3)
PM-10(4)	24-hour	50	150	150
	Annual Arithmetic Mean	55	50	50
Sulfur Dioxide	Annual Arithmetic Mean	20	80	--
	24-hour	365	365	--
	3-hour	1300	--	1300
Carbon Monoxide(5)	8-hour	5	10	
	1-hour	10	40	

Notes:

(1) Measured in micrograms per cubic meter unless noted otherwise.

(2) Designed to prevent adverse effects on public health.

(3) Designed to prevent adverse effects on public welfare including effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials.

(4) Respirable particulate matter under 10 microns in aerodynamic diameter.

(5) Measured in milligrams per cubic meter.

Source: State Department of Health, Environmental Protection and Health Services Division, 1988.

TABLE 2

SUMMARY OF SELECTED AIR QUALITY INFORMATION
BARBERS POINT, ISLAND OF OAHU
SULFUR DIOXIDE AND PARTICULATE MATTER CONCENTRATIONS

Maximum 24-Hour Concentrations
(micrograms per cubic meter)

Year	Sulfur Dioxide	Particulate Matter
1979	27	223
1980	10	158
1981	40	188
1982	12	63
1983	95	193
1984	5	112
1985	25	138
1986	10	66
1987	13	40

NUMBER OF TIMES
HAWAII AMBIENT AIR QUALITY STANDARDS
WERE EXCEEDED

Year	Sulfur Dioxide	Particulate Matter
1979	0	10
1980	0	2
1981	0	2
1982	0	0
1983	1	2
1984	0	1
1985	0	3
1986	0	0
1987	0	0

Source: State Department of Health, 1988.

TABLE 3

SUMMARY OF SELECTED AIR QUALITY INFORMATION
PEARL CITY, ISLAND OF OAHU
SULFUR DIOXIDE AND PARTICULATE MATTER CONCENTRATIONS

Year	Maximum 24-Hour Concentrations (micrograms per cubic meter) Sulfur Dioxide	Particulate Matter
1979	63	48
1980	15	93
1981	5	71
1982	10	54
1983	5	57
1984	5	45
1985	-	62
1986	-	65
1987	-	61

NUMBER OF TIMES
HAWAII AMBIENT AIR QUALITY STANDARDS
WERE EXCEEDED

Year	Sulfur Dioxide	Particulate Matter
1979	0	0
1980	0	0
1981	0	0
1982	0	0
1983	0	0
1984	0	0
1985	0	0
1986	0	0
1987	0	0

Note: No sulfur dioxide information available for the 1985-1987 period.

Source: State Department of Health, 1988.

The sulfur dioxide and particulate matter concentrations recorded at the Pearl City Station have not exceeded State standards. The project is downwind from Pearl Harbor and Pearl City when the prevailing northeast trades are blowing.

Carbon monoxide from automobile traffic on the H-1 Freeway and Fort Weaver Road is another potential source of air pollution. However, the State Department of Health is not currently monitoring this pollutant.

A spot sampling of carbon monoxide levels was taken in September 1987 for the West Loch Estates project ("Final Environmental Impact Statement for West Loch Estates," December 15, 1987). This sampling showed a one-hour concentration of 3.4 milligrams/cubic meter at the eastbound H-1 ramp of Kunia Interchange. The sampling was taken during the morning peak vehicular traffic, and northeasterly winds were blowing at 3 to 5 knots. The sampling was well below the State and Federal standards for one-hour concentrations of carbon monoxide which are 10 and 40 milligrams/cubic meter, respectively.

A second measurement during the same time period near the Fort Weaver Road/Renton Road intersection showed a one-hour concentration of 2.8 milligrams/cubic meter. During the sampling, westerly winds ranging from 2 to 7 knots were blowing.

Project Impact

The air quality impact evaluation conducted for West Loch Estates analyzed the combined effect of anticipated vehicular traffic from existing and proposed residential areas, including Ewa Gentry. Thus, this evaluation was believed to be valid for purposes of assessing the impact of the Ewa Gentry project and was utilized in the Final EIS for the project.

With the increased vehicular traffic anticipated at full development of West Loch and Ewa Gentry, the air quality in the vicinity of the project site will decrease due to increased levels of carbon monoxide.

EPA-recommended emissions and dispersion models were used by the West Loch consultant to estimate maximum carbon monoxide emissions for the adjacent West Loch project. His findings indicate that Hawaii ambient air quality standards would be exceeded within 10 to 40 meters of Fort Weaver Road.

The consultant recommended several mitigation measures to reduce the concentration of carbon monoxide along primary roadways, all of which are applicable to this project. They include:

1. Improvement of existing roadway intersections to accommodate greater capacity and reduce vehicular delays at primary intersections;

2. Increased public bus service, encouragement of car pools and development of a fixed mass transit system to reduce traffic volumes; and

3. Staggering of work hours and school schedules to reduce peak traffic volumes.

A 35 foot landscaped open area along both sides of the Fort Weaver corridor will separate residential areas from Fort Weaver Road and help to further mitigate the effect of increased carbon monoxide levels on adjacent homes.

The applicant has also agreed to participate in an air quality monitoring program as specified by the State Department of Health.

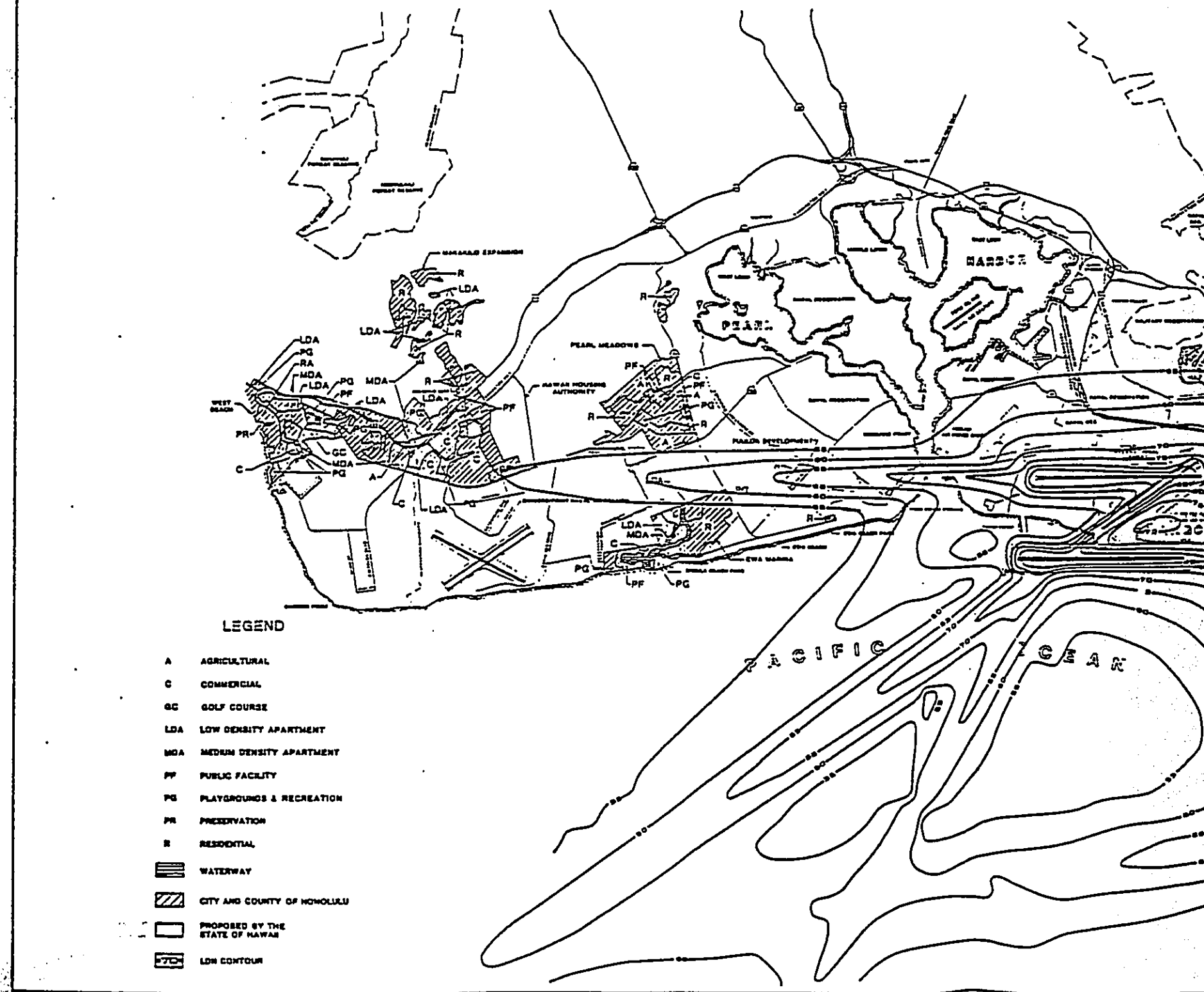
J. NOISE

Existing Conditions

The major source of noise in the Ewa district is the aircraft from Honolulu International Airport and Barbers Point NAS. Noise studies for the Ewa area indicate that the proposed Ewa developments are compatible with the existing aircraft noise environment (Darby-Ebisu and Associates 1983, Parnell and Associates 1984, Darby and Associates 1987, Miyake 1987).

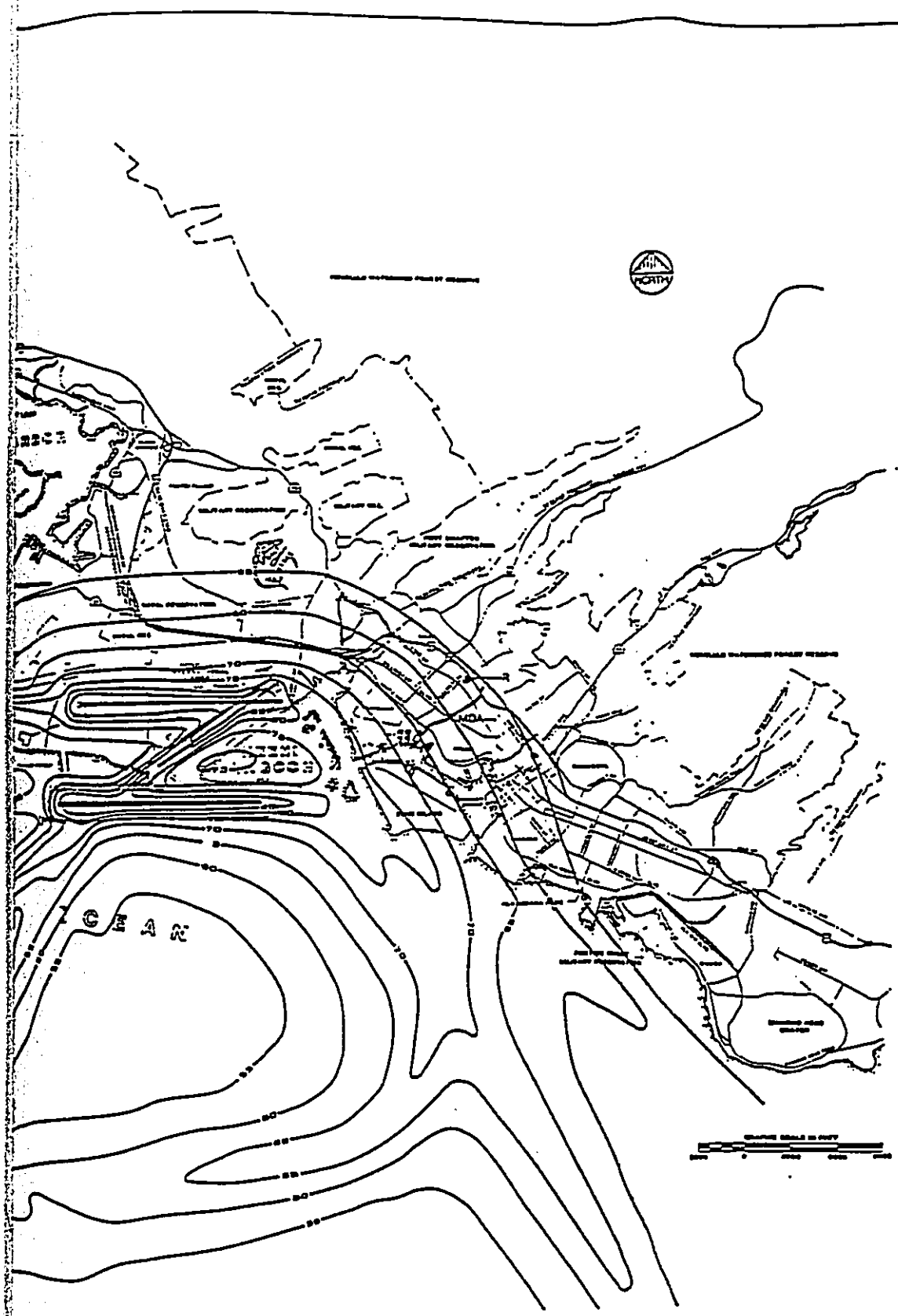
According to Federal noise guidelines, an outdoor noise level of 65 Ldn or less is "clearly acceptable", meaning, the noise level is low enough to allow indoor and outdoor activities with virtually no interference from noise. The State of Hawaii, however, has required the applicant to implement sound attenuation measures for residential units on property subject to noise levels of 60 to 65 Ldn.

As indicated on the State Department of Transportation's 1992 noise contour map for Honolulu International Airport (HIA), except for portions of the golf course area, the entire amendment area is below the 60 Ldn contour. About 50 acres of residential and apartment lands lie between the 55 and 60 Ldn contours.

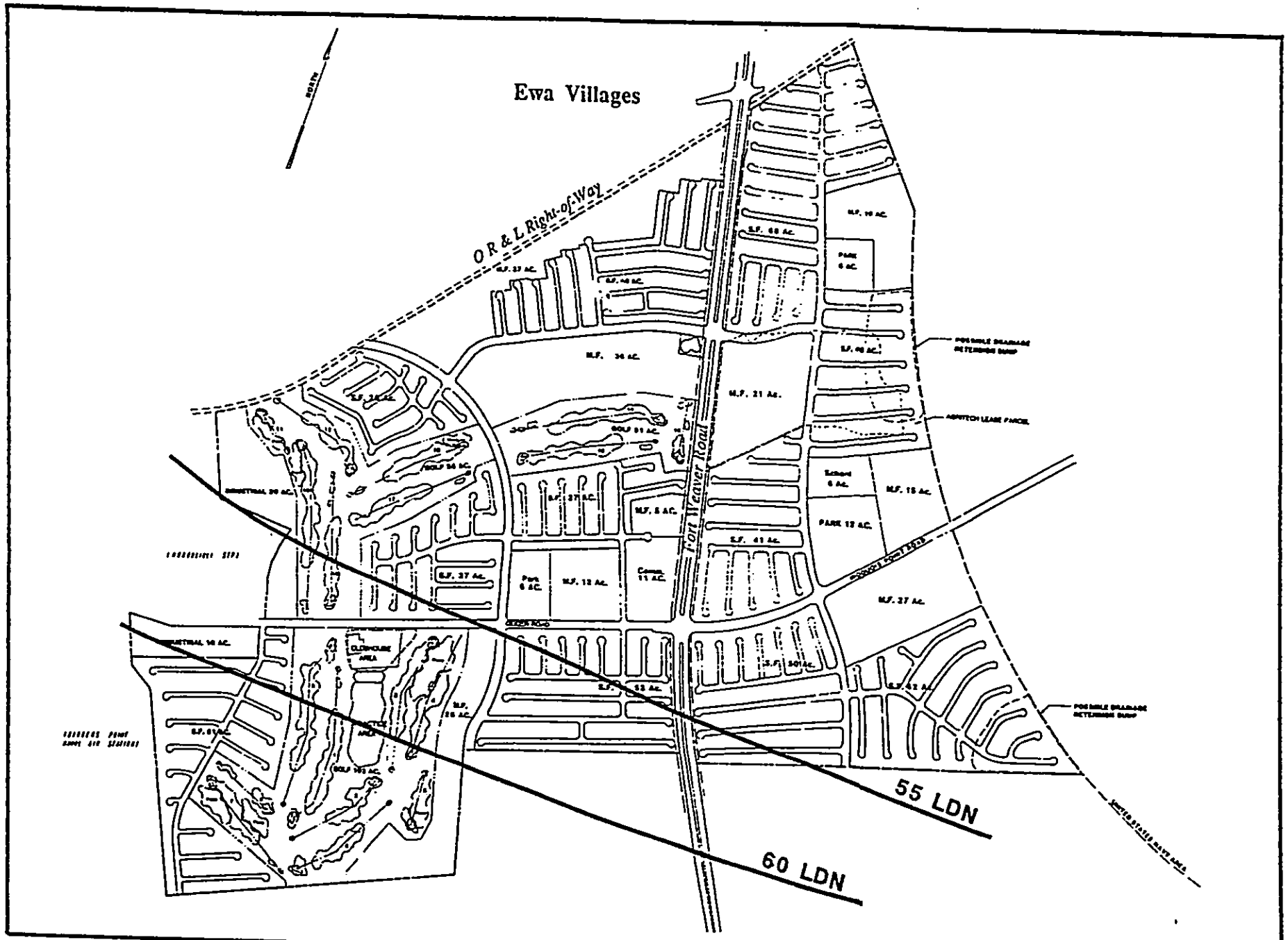


AIRPORTS DIVISION
DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII

HONOLULU INTERNATIONAL AIRPORT MASTER PLAN UPDATE AND NOISE COMPATIBILITY PROGRAM



IRPORT ND GRAM	KFC AIRPORT, INC. MANAGEMENT CONSULTANTS	1985 CITY AND COUNTY OF HONOLULU – DEVELOPABLE LANDS & 1992 LDN NOISE CONTOURS	



EWA by Gentry

Honouliuli, Ewa, Oahu, Hawaii

1992 LDN Noise Contours

TABLE 4

SUMMARY OF FEDERAL NOISE GUIDELINES AND STANDARDS

NOISE ZONE CLASSIFICATION

Noise Exposure Class	Noise Descriptor			HUD Noise Standards For New Residential Development
	DNL[1] Day-Night Average Sound Level	L_{eq}(hour)[3] Equivalent Sound Level	NEF[4] Noise exposure Forecast	
Minimal Exposure	Not Exceeding 55	Not Exceeding 55	Not Exceeding 20	"Acceptable"
Moderate Exposure	Above 55[2] But Not Exceeding 65	Above 55 But Not Exceeding 65	Above 25 But Not Exceeding 30	
Significant Exposure	Above 65 Not Exceeding 70	Above 65 Not Exceeding 70	Above 30 Not Exceeding 35	"Normally Unacceptable"
	Above 70 But Not Exceeding 75	Above 70 But Not Exceeding 75	Above 35 But Not Exceeding 40	
Severe Exposure	Above 75 But Not Exceeding 80	Above 75 But Not Exceeding 80	Not Exceeding 45	"Unacceptable"
	Above 80 But Not Exceeding 85	Above 80 But Not Exceeding 85	Above 45 But Not Exceeding 50	
	Above 85	Above 85	Above 50	

[1]CNEL - Community Noise Equivalent Level (California only) uses the same values.

[2]HUD, DOT, and EPA recognize L_{eq} = 55 dB as a goal for outdoors in residential areas in protecting the public health and welfare with an adequate margin of safety (Reference: EPA "Levels" Document.) However, it is not a regulatory goal. It is a level defined by a negotiated scientific consensus without concern for economic and technological feasibility or the needs and desires of any particular community.

[3]The Federal Highway Administration (FHWA) noise policy uses this decriptor as an alternative to L_{10} (noise level exceeded ten percent of the time) in conjunction with its policy for highway noise mitigation. The L_{eq}(design hour) is equivalent to DNL hours; 2) traffic between 10 p.m. and 7 a.m. does not exceed fifteen percent of the average daily traffic flow in vehicles per 24 hours. Under these conditions DNL equals L_{10} - 3 decibels.

[4]For use in airport environs only; is now being superceded by DNL.

Source: Federal Interagency Committee on Urban Noise - "Guidelines for Considering Noise in Land Use Planning and Control" - HTIS PB81-214124, June 1981.

Despite the project's proximity to Barber's Point NAS, the Navy's 1988 Air Installation Compatible Use Zones (AICUZ) study and settlement agreement with the Campbell Estate indicate that the project is outside the areas affected by NAS aircraft overflight operations.

For automobile traffic noise, the applicant's consultant, Dr. Iwao Miyake, studied noise levels within the project area.

A noise contour map for the project site was developed by taking the logarithmic sum of noise contributed to selected locations on the project site by traffic on the north and south bound lanes of Fort Weaver Road.

An analysis of the noise contour map indicates that the first row of residences along Fort Weaver Road falls into the U. S. Housing and Urban Development's (HUD) "Normally Unacceptable" land use category. This means mitigation measures must be taken to reduce the interior noise to an acceptable level. The remainder of the project site falls into HUD's "Clearly Acceptable" land use category, meaning the existing noise level is low enough to allow outdoor and indoor activities with little or no interference from traffic noise.

The dwellings along Fort Weaver Road in the first increment of Soda Creek were modified in accordance with the consultant's recommendations to meet HUD noise standards.

Project Impact

Future noise levels at the project site will increase with time as new housing and recreational developments are built in the Ewa area. Even so, the anticipated increase of approximately 2.5 dBA by the Year 2008 will not extend the "Normally Unacceptable" zone beyond the first row of residences on Fort Weaver Road.

The applicant's noise consultant, Dr. Miyake, has recommended the following measures to reduce the impact of vehicular noise along Fort Weaver Road:

1. Set back homes from the street rights-of-way. The homes along Fort Weaver Road will be separated from the roadway by a 35 foot landscaped greenway.

2. Construct a 5-6 foot high noise barrier wall or berm at the property line along Fort Weaver Road.

3. Provide double-wall construction on all walls facing Fort Weaver Road. For two story homes. insulate second story walls with fiberglass noise insulation blankets.

4. Accoustically treat the interior of living rooms and bedrooms with carpeting on the floor or accoustical tile on the ceilings.

5. Design second floor bedroom windows that face Fort Weaver Road to enable installation of a window air conditioner to accommodate residents who are sensitive to noise.

The applicant has implemented the foregoing measures in the first increment of development and intends to incorporate sound attenuation measures necessary to reduce noise levels to acceptable levels for the balance of the project area.

K. NAVAL OPERATIONS

The West Loch Branch of Naval Magazine Lualualei and Barbers Point NAS are located to the east and west of the project area. During State Land Use Commission hearings on the reclassification of lands for Ewa Gentry, U. S. Navy personnel expressed concerns relating to the impact of development on their current operations. In response to the Navy's concerns, the State Land Use Commission imposed the following conditions in granting approval of the Urban District reclassification. The applicant will comply with these conditions in developing the amendment area.

1. Disclose to initial purchasers the potential for aircraft noise and vibration from Barbers Point NAS, the existence of the Explosives Safety Zone at West Loch and the transportation of explosives and munitions on roadways in the vicinity of the project.

2. Participate with City and State civil defense agencies and the U.S. Navy in formulating an emergency preparedness and evacuation plan for the project due to its proximity to the Explosives Safety Zone.

3. Maintain an 80 foot wide, 25 foot high, obstruction-free corridor along Geiger Road and Iroquois Point Road for the purpose of aircraft towing.

4. Coordinate with the U.S. Navy to assure that development will not damage or limit access to utility, communication and fuel lines located within Geiger and Iroquois Point Roads.

5. Install a fence or other structure along the eastern boundary of the property to minimize inadvertent civilian entry into the Explosives Safety Zone.

6. The applicant will not construct any road which enters from the property onto Geiger or Iroquois Point Roads within 200 feet of any Navy installation boundary.

EXHIBIT C

EXHIBIT C

MARKET ASSESSMENT

Report to
Gentry Development Company

Covering
Market Assessments for

EWA GENTRY

a Proposed Development
Ewa, Oahu, Hawaii

August 1988

john child
& COMPANY, INC.

REAL ESTATE
APPRAISERS &
CONSULTANTS

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August 22, 1988

Mr. Norman Dyer
Gentry Development Company
94-539 Puahi Street
Waipahu, Hawaii 96797

Dear Mr. Dyer:

At your request, John Child & Company, Inc. has prepared market assessments covering the Ewa Gentry, a proposed housing development. This letter summarizes our assessments which are presented in the accompanying summary report.

BACKGROUND

Gentry Homes, Ltd., a Hawaii corporation, has developed Soda Creek as Phase I of the Ewa Gentry development. Gentry Development Company (Gentry), a Hawaii limited partnership, proposes to continue developing the Ewa Gentry project to include about 4,050 single-family homes and 3,500 multi-family units, a golf course, commercial center, and industrial park. The development is expected to be similar in concept to Gentry Waipio.

The Ewa Gentry development is planned to include approximately 1,016 acres. About 331 acres are currently designated Urban. The remaining 685 acres are designated Agriculture. Gentry is in the process of preparing a land use application requesting urban classification for the 685 acres. In this regard, you have asked us to assist you by assessing the market support for the residential and golf course aspects of the proposed development.

Robert J. Vernon, MAI, CRE
Theodore Wrobel, SREA, ASA
Karen Char, MAI

Craig T. Smith, ASA
Uson Y. Ewart, ASA
Paul D. Cool

STUDY OBJECTIVE

The objective of our assistance is to estimate the current market support for single-family and multi-family residential projects, and a golf course at Ewa Gentry in terms of:

- Residential target market characteristics
- Residential property characteristics and sales prices
- Projected annual absorption by residential unit type
- Projected annual rounds of golf play and target market.

STUDY APPROACH

The accompanying report is divided into four sections. Each section summarizes the analysis covering a different land use in the Ewa Gentry project. The sections are summarized as follows:

Residential

The residential land uses are analyzed in two parts. One analysis addresses the demand for single- and multi-family units which would be affordable to gap group buyers (Group I units). These units would be affordable to households with incomes of 80% to 120% of the median household income on Oahu.

The second analysis addresses demand for the remaining single-family units which would be priced above the typical gap group market. Most of these units would be affordable to households with incomes of 120% to 140% of the median household income on Oahu (Group II units). Some single-family units will be priced at higher levels.

Section II of the accompanying report summarizes our methodology and findings covering demand for the Group I units. Section III of the report summarizes the analysis covering demand for the Group II and higher priced units.

Golf Course

Section IV of the report summarizes our methodology and findings covering the projected number of rounds of golf play estimated for the Ewa Gentry golf courses.

DEFINITION OF TERMS

The following terms used in the report relate to the market for residential units in Ewa Gentry.

Gap Group

The gap group is defined as Oahu households with annual incomes between 80% and 120% of the median household income for the City & County of Honolulu as determined by the City & County of Honolulu or the Hawaii Housing Authority.

Group I Units

Group I units are defined as housing units planned for development at Ewa Gentry which are priced at levels which would be affordable to the gap group market based on current income and financing levels.

Group II Units

Group II units are defined as housing units which are priced at levels affordable to those households with annual incomes between 120% and 140% of the median household income for the City & County of Honolulu.

Group III Units

Group III units are units which are priced at levels affordable to households with annual incomes over 140% of the median household income for the City & County of Honolulu.

PROJECT DESCRIPTION

The Ewa Gentry development is planned to include about 7,550 units. Current plans include a variety of unit types ranging from single-family homes to low-density apartments. The proposed land use plan is summarized as follows:

Ewa Gentry Land Use Plan

	Development Area			
	West of Fort Weaver Road		East of Fort Weaver Road	
	Acres	Units	Acres	Units
Single-family	271	2,120	248	1,930
Multi-family	95	1,670	98	1,830
Commercial	8			
Industrial	30			
School	7			
Park	8		18	
Golf course	180			
Roadways	18		15	
Greenway, drainage & 35' setback easement	12		8	
Total	629	3,790	387	3,760

LIMITING CONDITIONS AND UNDERLYING ASSUMPTIONS

This report is subject to the limiting conditions and underlying assumptions presented in the accompanying report.

ESTIMATED MARKET SUPPORT FOR HOUSING DEVELOPMENT IN CENTRAL OAHU AND EWA

Ewa and Central Oahu will continue to be the focus of new residential development on Oahu because of governmental policy, the availability of land, and the emergence of Ewa as the secondary urban center for the island.

Group I Units

The current size of the gap group on Oahu is estimated to be about 30,000 households based on studies prepared for State and City agencies and additions to the gap group housing inventory in recent years. About 12% to 15% or 3,600 to 4,500 households are estimated to be actively seeking housing units each year. As a result,

public and private developments which have been oriented to the gap group over the recent past have enjoyed very strong market response because interested purchasers far outnumber available units.

Over recent years the number of new gap group units has not significantly reduced overall demand.

As a result, the demand for gap group housing continues to be very strong for all single-family gap group housing projects within reasonable travel time to employment. However, recent success in marketing housing projects with prices oriented to the gap group market has encouraged more development of such housing. In addition, the recently announced State requirement for 60% of new housing development to be allocated to Group I and Group II housing will result in a greater number of new units in the future. About one-half of this requirement or 30% of a new project's inventory would be designated for the gap group. However, with up to 4,500 housing units oriented to the gap group market required annually, the projected demand is expected to continue to exceed supply. Demand for Group I units in the Ewa and Central Oahu districts is estimated at about 3,000 units per year.

Group II and Group III Units

Projected residential housing requirements for Group II and Group III units in Central Oahu and Ewa is estimated at about 2,600 new units per year. Currently, housing demand exceeds supply. Despite the very significant number of planned and proposed residential developments projected for the Ewa and Central Oahu districts, demand will continue to exceed supply over the foreseeable future because significant portions of new projects are oriented to gap group households.

Because the various developments proceed on their own timetables, largely independent of the other projects, it is probable that the delivery of housing units will not be uniform. Occasional periods of oversupply as well as shortages will occur over the next 10 to 15 years.

During periods of oversupply, developers of major projects may delay proposed project phasing to minimize surplus inventory. Group III units will compete in terms of location, price, design, and project amenities.

MARKET ASSESSMENTS
FOR EWA GENTRY

With the development of Ko Olina, Kapolei, and the deep draft harbor, the Ewa District would continue to grow in desirability as a place of employment and residence. Ewa Gentry is one of several developments which will accommodate the anticipated growth in Ewa. Based on the success Gentry has had in developing and marketing Soda Creek, as well as numerous past projects, the Ewa Gentry project would be well designed and would effectively compete with the other planned developments at all price levels.

Selling Prices

The Ewa Gentry project will offer a range of unit types and sizes to accommodate demand for Group I, Group II, and Group III housing units. The general price ranges of units which would be offered at Ewa Gentry are summarized as follows (constant 1988 dollars):

Housing type	Price range
Group I multi-family	$ 60,000 - $110,000
single-family	120,000 - 150,000
Group II (single-family)	140,000 - 160,000
Group III single-family	160,000 - 200,000+

Absorption

The market has already demonstrated a very positive response to Soda Creek, the first phase of the Ewa Gentry development. The 413 single-family units priced in the $120,000 to $150,000 range sold out within a three-week period, with 206 units sold in the first two days! This strong market response reflects the strong competitive position of the Ewa Gentry development because of unit design, unit pricing, and project amenities.

Based on the analysis of projected housing demand and supply in the Ewa and Central Oahu districts, and the competitiveness of the Ewa Gentry project, we estimate the Ewa Gentry development could sell between 690 and 800 single-family units and about 300 multi-family units per year.

Ewa Gentry Golf Course

Existing golf courses on Oahu only accommodate about one-half the demand for golf play. As a result, most golf courses on the island are playing at maximum capacity which is over two to three times national averages, and many residents and visitors are not getting to play golf as often as they would like.

Although 16 more golf courses are proposed for development on Oahu over the next 10 years, demand from growth in resident and visitor populations will increase and continue to exceed available capacity of the courses.

The Ewa Gentry golf course is one of these 16 proposed courses. Planned as a private course which will allow limited public play, the Ewa Gentry golf course should achieve about 60,000 to 70,000 rounds per year.

* * * * *

We appreciate having the opportunity to assist you. Please call us if you have any questions.

Very truly yours,

JOHN CHILD & COMPANY, INC.

for

Karen Char, MAI
Executive Vice President

Uson Y. Ewart, ASA
Appraiser

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TABLE OF CONTENTS

I - INTRODUCTION AND BACKGROUND

This section presents the background, study objective, project description, and limiting conditions and underlying assumptions.

BACKGROUND

Gentry Homes, Ltd., a Hawaii corporation, has developed Soda Creek as Phase I of the Ewa Gentry development. Gentry Development Company, a Hawaii limited partnership, (Gentry) proposes to continue developing the Ewa Gentry project to include about 4,050 single-family homes and 3,500 multi-family units, a golf course, commercial center and industrial park. The development is expected to be similar in concept to Gentry Waipio.

The Ewa Gentry development is planned to include approximately 1,016 acres. About 331 acres are currently designated Urban. The remaining 685 acres are designated Agriculture. Gentry is in the process of preparing a land use application requesting urban classification for the 685 acres. In this regard, you have asked us to assist you by assessing the market support for the residential and golf course aspects of the proposed development.

STUDY OBJECTIVE

The objective of our assistance is to estimate the current market support for single-family and multi-family residential projects, and a golf course at Ewa Gentry in terms of:

- Residential target market characteristics
- Residential property characteristics and sales prices
- Projected annual absorption by residential unit type
- Projected annual rounds of golf play and target market.

PROJECT DESCRIPTION

The Ewa Gentry development is planned to include about 7,550 units. Current plans include a variety of unit types ranging from single-family homes to low-density apartments. The proposed land use plan is summarized as follows:

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Roadways	18		15	
Greenway, drainage & 35' setback easement	12		8	
Total	629	3,790	387	3,760

LIMITING CONDITIONS AND UNDERLYING ASSUMPTIONS

This report is subject to the following limiting conditions and underlying assumptions.

Property Description

A complete legal description was not reviewed by the appraisers. The appraisers reviewed maps, photographs, site plans, and other descriptive material covering the existing site and proposed development site plans. Conclusions relating to the physical character of the site and its adaptability for residential development is based upon information developed by the various consultants to Gentry Development Company and onsite inspections.

Basis of Analysis, Opinions, and Conclusions

The absorption rate conclusions assume the project is marketed as fee simple units, and reflect the sizes, characteristics, and price ranges concluded as appropriate in the analysis.

The selling prices of units which would be affordable to the gap and any other income-defined group will vary in relation to median income levels and interest rates. While pricing levels, which are currently affordable to these groups, will change in proportion to median income over the projected marketing period, there will not

be significant changes in the number of households who could afford to purchase homes. No significant change in interest rates is projected over the Ewa Gentry marketing period.

The analysis, opinions, and conclusions of this report are our informed judgement based on market and economic conditions as of the date of the report.

We have relied on data and information provided by others. We believe the information to be reliable; however, we do not assume any responsibility for the accuracy of information provided by others.

Our analysis, opinions, and conclusions assume:

1. No hidden adverse surface or subsurface, drainage, subsoil, ground water, or geological structures or conditions exist.

2. *The client has provided us with all significant, relevant* information covering the subject of this report.

3. There are no hazardous or environmentally dangerous materials present which would have an impact on the value or use of the property.

No responsibility is assumed for matters legal in character nor for the title which is assumed to be good and merchantable.

Any drawings, maps, photographs, and similar exhibits accompanying this report are included to assist the reader in visualizing the property. No responsibility is assumed for the accuracy of these exhibits.

All applicable public and private zoning codes and regulations, building and health codes, and other factors which affect the utility and value of the property were considered.

Terms of Assignment

We have no obligation to update our report because of events and transactions occurring subsequent to the date of the report.

Neither our fees nor payment were contingent upon the results of the report.

Use of Report

This report is prepared as part of the land use reclassification petition and will be incorporated in its entirety in the Appendix. This report may not be reproduced or published for any other purpose without the prior written consent of John Child & Company, Inc., and then only with proper qualification.

This report conforms with the By-Laws and Regulations of the American Institute of Real Estate Appraisers of the National Association of Realtors, the International Society of Real Estate Appraisers, and the American Society of Appraisers.

The contents of this report, the identity of the appraisers or any reference to John Child & Company, Inc., the American Institute of Real Estate Appraisers, the International Society of Real Estate Appraisers, and the American Society of Appraisers, or to their respective designations may not be disseminated to the public through advertising media, public relations media, news media, sales media, or any other public means of communication.

II - MARKET ASSESSMENT - GROUP I UNITS

This section summarizes the study approach and market assessments for Group I units at Ewa Gentry. Group I units would be priced at levels for which households with incomes between 80% and 120% of the Oahu median household income (the gap group) could qualify.

STUDY APPROACH

The study approach to complete the market assessments for Group I units is outlined as follows:

- Overview of housing and demographic trends on Oahu, Central Oahu and Ewa.
- Review of recent publications covering affordable housing. The articles include:
  - Oahu's Affordable Housing Crisis, Department of Housing and Community Development (DHCD), City & County of Honolulu, dated March 16, 1987.
  - Three-Year Housing Assistance Plan For The City & County of Honolulu, October 1985-September 1988, DHCD, City & County of Honolulu, dated June 1985.
  - Hawaii State Plan: Affordable Housing Issue Paper, Department of Planning and Economic Development, State of Hawaii, dated December 1984.
  - Affordable Housing Issue Paper, Department of Planning and Economic Development (DPED), Hawaii, dated December 1981 - Daly & Associates, Inc.
- Interviews with representatives of DHCD and Housing Finance and Development Corporation (HFDC), formerly Hawaii Housing Authority, as a basis to evaluate household income levels and housing prices the gap group could afford.
- Review of historical absorption rates, sales price range, buyer profile and unit characteristics of comparable projects oriented to the gap group.
- Identification and evaluation of existing and proposed competitive residential developments on Oahu sponsored by HFDC, DHCD, or private developers.
- Assessment of the competitiveness of the proposed Ewa Gentry project in relation to the current and proposed residential projects on Oahu.

- Estimate of the absorption period for the proposed Ewa Gentry project based on the absorption rates experienced by recent comparable projects, projected market trends, and the anticipated pricing levels and competitive position of the Ewa Gentry project.

REGIONAL BACKGROUND

Trends in Hawaii, Oahu, Central Oahu and Ewa were reviewed in terms of population, personal income, employment and economic activity. Significant trends are outlined as follows:

- Resident population of Hawaii is projected to reach 1.1 million by 1990 and 1.4 million by 2005.
- Personal income in Hawaii has increased 8% to 12% annually since 1965 and compares to National levels.
- Employment continues to grow in government, service and retail trades; Hawaii's current unemployment rate of 3.9% compares favorably to National averages.
- Economy of the State is expected to remain strong.
- Resident population of Oahu is expected to reach 975,100 by 2005.
- Most dramatic growth in the past 10 to 15 years occurred in Central Oahu; however, in the next 10 to 20 years growth is expected to focus in the Ewa area.
- 1985 population distribution on Oahu includes about 4.5% in Ewa (36,738 residents) and 14.1% in Central Oahu (114,611 residents).

DEFINITION OF GAP GROUP

The gap group household is defined in relation to median household income. Addendum A summarizes median household income as determined by the U.S. Department of Housing and Urban Development (HUD). The DHCD defines gap group households as those with incomes between 80% and 120% of the median household income estimate provided by HUD for metropolitan areas of Hawaii. The HFDC gap group definition is also based on the HUD median income estimate and is very similar. The Group I units will be oriented toward the gap group households.

GAP GROUP OR GROUP I MARKET

The gap group housing market was reviewed in terms of household incomes, population, and supply and demand relationships on Oahu. Significant trends relating to the gap group market and housing inventory on an island-wide basis are outlined as follows:

- The minimum and maximum income levels for typical household sizes under the current DHCD and HFDC guidelines are as follows:

Gap Group Qualification

Number persons in household	Household Income 80% Minimum	Household Income 120% Maximum
2	$23,350	$35,024
3	26,300	39,450
4	29,200	43,800
5	31,050	46,574

- In 1980, estimated gap group households on Oahu totaled 39,366 households. A total of 27,292 of these households were renting their units.

- Since 1980, sales prices of homes have risen faster than increases in household income. This has resulted in an increase in the number of gap group households.

- Over 30,000 households on Oahu are currently estimated to be in the gap group market based on the Daly & Associates, Inc. Affordable Housing Issue Paper, prepared in 1981, and 1981 to 1988 trends in Oahu population, household incomes, and affordable housing inventory.

- Demand for affordable housing will increase because of increasing numbers of household formations which increase the competition for housing and push prices further upward.

- The problem of housing affordability shows no sign of dissipation in the near future; factors influencing both supply and demand are expected to continue pushing the cost of housing further out of reach of the average household.

- Specific needs of the gap group desiring to become home-owners include: smaller, lower cost "starter homes," and/or reduced initial cost to enable them to qualify to purchase.

- The gap group market is an island-wide market. Projects located in reasonable proximity to employment, schools and shopping would effectively compete for the gap group buyer.

GAP GROUP HOUSING INVENTORY

Historic Inventory

The historical and current inventory of gap group housing on Oahu was reviewed. Significant trends and findings are outlined as follows:

- The current range of purchase prices a gap group household could afford, based on household size, income, 10% down payment, 33% qualifying ratio, $100 per month reserves, and 30-year conventional financing at 10.0% interest, are summarized as follows:

Gap Group Unit Pricing

Number persons in household	Estimated Range of Purchase Prices	
	Minimum	Maximum
2	$ 68,600	$109,300
3	78,900	124,700
4	89,000	139,800
5	95,400	149,500

- Relatively few gap group projects have been marketed over the recent past. Those which offered a single-family detached unit in a reasonable location attracted more qualified buyers than units available for sale, and consequently, experienced short marketing periods.

- Until recently, the private sector has not played a major role in providing single-family units oriented to the gap group. A review of major projects over the past two years indicates a change in this trend:

Major Affordable Projects

	1986	1987
Private sector projects:		
Single-family	0	413
Multi-family	582	434
Publicly assisted projects:		
Single-family	493	15
Multi-family	42	44
Total	1,117	906

- These major projects are estimated to represent about 75% of the affordable units marketed on Oahu which were oriented to the gap group purchaser. Therefore, total annual additions are estimated at between 1,200 and 1,500 new affordable housing units per year.

- Most of these major projects typically attracted at least three times as many qualified buyers as there were units available for sale. Therefore, demand indicated by buyer interest is estimated to range from 3,600 to 4,500 units annually.

- The number of gap group units developed by the public and private sector has not been sufficient to significantly reduce the overall demand for gap group housing units.

- Based on the relatively limited numbers of affordable units which have been marketed in the recent past, the outlook for construction of affordable units is not encouraging. Rising material costs, coupled with the increasing cost and limited supply of suitable land, can be expected to continue pushing the costs of producing housing units higher.

- The State has announced its policy of requiring 60% of new housing inventory to be affordable as a condition of land use reclassification. About one-half of the affordable housing requirements or 30% of new additions recently approved by the LUC will be oriented to the gap group. As a result, significantly more future housing development on land not currently zoned for residential use could be oriented to the gap group market.

Planned and Projected Inventory

Publically assisted gap group housing developments are generally developed as individual projects. In the private sector large residential developments either develop individual projects oriented to the gap group market or orient a portion of a larger project inventory to the gap group. A review of major housing projects which are currently being developed or are proposed for development and contain competitive affordable units indicates the following:

- The projects include 27,878 proposed residential units. About 43.2% (12,058 units) are proposed to be marketed as gap group units. See Addendum B for a summary of these projects.

- About 51% (6,176 units) of the gap group units are expected to be single-family units, and 39% (4,730 units) are expected to be multi-family units. The unit types of the remaining units have not been specified.

- About 510 of the 6,176 single-family gap group units have already been marketed and are under construction.

- Marketing is projected to commence on about 5,200 gap group units prior to 1991. However, many projects require land use/zoning approvals which may delay the projected time-tables.

- About 37% or 1,927 of the units scheduled to commence marketing prior to 1991 are single-family units.

- About 43% of the total proposed gap group units are multi-family; however, market patterns have shown that the single-family dwellings are more desirable if they can be afforded.

- Currently, the major competing gap group projects on Oahu would be Kahi Kani, a proposed 290±-unit single-family project in Whitmore Village, and a portion of West Loch Estates, a proposed 750-unit single-family project in Honouliuli, Ewa, immediately to the northeast of the Ewa Gentry development.

ESTIMATED MARKET SUPPORT FOR GAP GROUP HOUSING

Affordable unit additions on Oahu are estimated to have ranged from 1,200 to 1,500 units over the recent past. With an estimated annual demand for 3,600 to 4,500 gap group units, there has been an unfulfilled demand for about 2,400 to 3,000 affordable units per year. An additional 11,100 units are proposed to be oriented to the gap group in Ewa and Central Oahu over the foreseeable future. If all of the proposed projects market units according to current schedules, there would be about 1,000± units added annually over the foreseeable future. However, it is probable that many of these proposed developments will be significantly delayed or altered, and there would still be unfulfilled demand.

The marketing of recent projects oriented to the gap group market reflects this pent up demand. These projects have attracted large numbers of prospective gap group purchasers from wide geographic areas. Typically, as many as three to four times as many buyers as available units have been attracted to these affordably priced projects.

The location of the housing units has not been a significant factor unless the project was in a very remote location. Location is expected to remain a less significant factor within the gap group market, if the right housing product can be offered at an affordable price and the project is located in reasonable proximity to employment, schools, and shopping.

MARKET ASSESSMENT FOR
EWA GENTRY GROUP I UNITS

The island-wide market demand for gap group housing is expected to remain very strong over the foreseeable future. While most residential developments in the Central Oahu/Ewa area will have significant portions of their inventory oriented to the gap group market, a sufficient demand would exist to accommodate all anticipated supply.

Unit Sizes and Price

Because of the range of household sizes and income levels comprising the market, a range of unit types and sizes would be appropriate for Ewa Gentry. Based on discussions with the developer, the Ewa Gentry project will offer units ranging from $60,000 to $150,000 in 1988 dollars which would be affordable to the gap group market. Based upon a review of past and current Gentry projects oriented to the gap group, we are of the opinion that the following unit types, sizes, and price ranges would be marketed at Ewa Gentry:

Mix of Group I Units

Unit type	Bedroom/ bath count	Net living area excluding carport (#)	Estimated selling price range
Single-family	2/1-2	800- 950	$120,000-$130,000
	3/2	1,050-1,200	130,000- 145,000
	3-4/2.5	1,350-1,550	145,000- 150,000
Multi-family	1/1	500- 550	60,000- 70,000
	2/1-2	600- 700	70,000- 90,000
	2/2	800-1,000	90,000- 110,000

Absorption

Comparable single-family developments affordable to the gap group market have experienced very rapid absorption rates. Multi-family projects oriented to the same market have not been absorbed as rapidly as single-family units. A summary of recently marketed projects including absorption rates is presented in Addendum C. Addendum D includes a summary of selected projects which are or have been oriented to or affordable to the gap group market.

The sales experiences of projects affordable to the gap group reflect the following absorption data:

- Single-family units generally have absorption rates which are two to three times faster than absorption rates for multi-family projects.

- The average monthly absorption rate for the four major publicly assisted single-family projects in 1986 was 91 units. These units were sold with a buy-back provision which effectively precludes the buyer from benefiting from any future increase in the unit value for 10 years.

- Soda Creek is the only major privately developed single-family gap group project on Oahu in the past two years. While all of the unit sales have not closed, most of the 413 units were "sold" within a two-month period. It did not have a buy-back provision.

- The average monthly absorption rate for the five most recent privately developed multi-family projects is 29 units. These units do not have buy-back provisions.

- Gentry consistently captured 34% to 42% of the single-family sales in Central Oahu and Ewa during periods when the Waipio Gentry development marketed single-family units. A comparison of single-family unit sales is shown in Addendum H.

- Gentry captured between 39% to 74% of the multi-family sales in Central Oahu and Ewa during 1983 to 1986 based on sales in the Crosspointe and Waipio Gentry developments. Addendum I summarizes multi-family unit sales in the Ewa and Central Oahu area.

The very positive response to Soda Creek, the first increment of Ewa Gentry, indicates significant demand exists for well designed units in a master-planned development in this location. While future Ewa Gentry single-family Group I units could experience similar rapid sell-offs, a lower absorption rate is projected due to increased competition from other developments. With the requirements for affordable housing demanded of new projects, it is probable that there will be significantly more competition within the gap group market.

The overriding factors for affordable housing are price, type of unit, unit size, and unit design. Location is not a significant factor provided the project is located in reasonable proximity to employment, schools, and shopping. Positive factors which contribute to the competitiveness of the Ewa Gentry project include:

- Proven ability of the Gentry Companies to effectively compete in the Central Oahu and Ewa markets.

- Innovative design solutions have enabled Gentry to maximize development densities yet provide efficient and attractive living units which have met with strong market acceptance.

- Gentry pre-fabrication building system provides competitive cost advantage in the construction of units.

- Ewa land prices are equal to or lower than Central Oahu. As a significant component of the unit cost, this factor will add to the competitive pricing advantage available to Gentry.

- Development of Ko Olina (West Beach) and the Kapolei Town Center as new employment centers will enhance the attractiveness of Ewa as a residential location.

- Development of a golf course, 30-acre industrial park and 8-acre commercial center within the Ewa Gentry project will create nearby job opportunities.

Based on these factors, we estimate single-family units in Ewa Gentry oriented to the gap group would achieve absorption rates of about 45 to 50 units per month. This rate is just over one-half of the monthly absorption rate experienced in major publicly assisted single-family projects in 1986, and only one-fourth the absorption rate experienced in Soda Creek. A more moderate absorption rate of 25 units per month is projected for the Ewa Gentry multi-family units. This rate is comparable to that experienced in the Waipio Gentry development and more conservative than the rate experienced in the marketing of Crosspointe.

Based on these annual absorption rates, Ewa Gentry is projected to be able to market 540 to 600 single-family units per year and 300 multi-family units per year at prices which would be affordable to the gap group.

III - MARKET ASSESSMENT - GROUP II AND GROUP III UNITS

This section summarizes the study approach and market assessments for the single-family units in Ewa Gentry priced at higher levels than the Group I units. These units would include Group II units priced at levels which are affordable to families with household incomes at 120% to 140% of the median income, and higher priced Group III units.

STUDY APPROACH

The study approach to complete the market assessments included:

- Review of current and projected demand for housing units on Oahu and especially in Ewa and Central Oahu.
- Review of sales absorption rates, sales prices, buyer profiles, and unit characteristics of comparable projects.
- Inventory of competitive under-construction, planned and proposed inventory in all major residential development in Ewa and Central Oahu.
- Review of the competitive strategies of major residential developments in Ewa and Central Oahu.
- Estimate the unit sizes and average sales prices appropriate for Ewa Gentry.
- Estimate of average annual absorption of these higher priced Ewa Gentry single-family units.

GROUP II UNIT PRICING

Group II units are defined as those units which would be priced at levels which are affordable to households whose income range from 120% to 140% of median income.

The range of selling prices for the Group II units, estimated as affordable to these households, is estimated based on the following assumptions: interest rate of 10%, 30-year mortgage, income to loan ratio of 33%, 10% down payment and a monthly reserve of $100. These prices are summarized as follows:

No. of persons	Group II Unit Prices 120% Minimum	140% Maximum
2	$109,200	$129,600
3	124,700	147,600
4	139,800	165,200
5	149,500	176,500

This section of the analysis assesses the market support for Ewa Gentry units priced within these guidelines as well as higher priced units which would attract other market segments.

CURRENT HOUSING DEMAND

The historical and current demand for housing on Oahu was reviewed. Significant trends are outlined as follows:

- Since 1981, between 2,500 and 4,000 new housing units have been added annually on Oahu.
- At the same time vacancies have remained relatively low, ranging from 3.1% to 4.7%.
- About 41% of Hawaii's housing inventory is owner-occupied.
- Over the past 15 years, the strongest growth in new housing units has been concentrated in Central Oahu. Between 1980 and 1985, occupied housing units in Central Oahu increased from 26,300 to 31,300. This increase accounted for 10% of Oahu's increase in occupied inventory.
- During the same period, occupied housing units in Ewa increased from 8,800 to 9,200 units. In 1985, Ewa represented 3.7% of Oahu's occupied inventory.
- Since 1980, over 23,000 new housing units have been added on Oahu. About 9,400 are single-family units.
- Annual new sales in major projects in Ewa and Central Oahu have averaged as follows:

Mililani	300-400
Makakilo	100-200
Gentry-Waipio	300-400
Village Park	250-300

- Overall, an estimated annual average of 800 to 1,200 units have sold in Ewa and Central Oahu.

- From 1981 to 1985, average sales prices for residential properties on Oahu have remained relatively stable. Since 1985, average Oahu prices, as reported by the Multiple Listing Service system, have increased by 14% annually.

- In comparison, average single-family sales prices in Ewa have increased about 4% annually since 1985.

- Average sales prices for single-family residential properties ranged as follows:

	Oahu	Ewa
1981	$191,597	NA
1982	184,227	NA
1983	188,742	NA
1984	187,270	$138,600
1985	188,900	139,100
1986	210,600	144,925
1987	283,086	157,125

PROJECTED HOUSING DEMAND

Demand for housing on Oahu is expected to continue to remain strong as population, employment and household incomes continue to increase. Significant trends in projected housing demand are outlined as follows:

- Department of General Planning (DGP) projects Oahu's population to increase to 975,100 persons by 2005. The increase in population by 2005 would represent an additional demand for at least 48,200 housing units, assuming an average household size of 2.9 persons on Oahu.

- On Oahu, the primary new demand for housing would be in Ewa because of new employment opportunities created by:

  - Ko Olina Resort
  - Expansion of Campbell Industrial Park
  - Barber's Point Harbor
  - Kapolei Town Center.

- According to DGP, the population of Ewa is expected to double to 83,100 by 2005. At an average household size of 2.9 persons, this indicates a demand for about 14,300 new housing units in Ewa by the year 2005. However, DGP's estimates of the population in Ewa may be conservative because:

- Oahu's overall demand for new households could represent at least 48,200 new units and, other than Ewa and Central Oahu, there are few areas which could accommodate single-family and low-density multi-family development.

- Ewa and Central Oahu would be expected to represent a significant portion of the new demand because of:

  . State and County policies and objectives.

  . New job opportunities in both Ewa and Central Oahu.

  . Availability of competitively priced residential properties.

- Historical annual absorption levels of 800 to 1,200 units in Ewa and Central Oahu would be expected to double to 1,500 to 2,500 units over the next 20 years. Ewa would attract about two-thirds of the future units based upon projected population growth, say 1,000 to 1,700 units per year.

- Overall new housing demand in Ewa and Central Oahu is estimated to be about 42,000 units by 2005. However, considering an average vacancy rate of about 5%, the actual new housing units required would be about 44,200 units by 2005, or an average of 2,600 units per year.

EXISTING AND PROJECTED HOUSING INVENTORY

Major residential developments in Ewa and Central Oahu were evaluated in terms of development status. These developments are summarized in Addendum E. The existing and projected housing inventory for Ewa and Central Oahu is summarized as follows:

- Current unsold inventory in major projects is very limited and this has resulted in a very strong competition among buyers.

	Unsold Inventory	
Project	Single-family	Multi-family
Mililani	0	240
Waipio Gentry	0	0
Village Park	0	0
Makakilo	131	41
Total	131	281

- Typical sales prices of the unsold inventory:

Project	Sales Price Range	
	Single-family	Multi-family
Mililani	---	$78,000-214,000
Makakilo	$140,000-223,000	78,000-134,000

- Over 48,000 additional units are proposed as follows:

Project	Potential new units
Ewa	
Kapolei Knolls	500
West Loch Estates	1,500
Makakilo	3,000
Kapolei Village	4,871
Puuloa Estates	315
Ewa Marina	4,850
West Beach	5,200 [1]
Ewa Gentry	7,550
Kapolei Town Center	N.A.
Central Oahu	
Mililani Mauka	6,640
Waikele	2,700
Village Park	3,480
Waiawa Ridge	7,906
Total	48,512

- State land use and County zoning approvals are required to develop the proposed projects. Current approvals permit development as follows:

	Potential new units
Development approvals obtained	19,970
State land use approved [2]	14,861
State and County approvals required	16,081

[1] Excludes 4,000 luxury resort condominium units.
[2] Includes conditional approval for Waiawa Ridge.

- However, approvals are expected for a significant number of new units. About one-third of the 48,500 units proposed for development in Ewa and Central Oahu require government approvals. Most of the units in these proposed developments would fall within the pricing guidelines for Group II units.

- The annual additions could range from about 800 to 3,300 units based on the current schedule, but portions of this anticipated supply are oriented to the Group I market. Addendum F provides a summary of single-family unit absorption rates in selected developments.

- The proposed price ranges of competitive projects are as follows:

Project	Units	Sales price range
West Loch	1,500	$130,000-190,000
Mililani Mauka	6,640	118,000-280,000
Waikele	2,700	130,000-200,000
Village Park (expansion)	3,480	120,000-195,000
Makakilo	3,000	119,000-190,000
Waiawa Ridge	7,906	125,000-165,000
Kapolei Village	4,871	130,000-150,000
West Beach	5,200	N.A.

Addendum G provides a summary for selected major residential developments in Waianae, Ewa and Central Oahu which would compete with the Ewa Gentry units.

ESTIMATED MARKET SUPPORT FOR HOUSING DEVELOPMENT

In Addendum H, projected housing demand in Ewa and Central Oahu is compared to projected supply. Because it is not possible to accurately segregate the proposed additions to the housing inventory into Group I, Group II and Group III units, the comparison includes annual demand for 3,000 Group I units and 2,600 Group II and Group III units. Projected supply of housing includes the most current data available through public records and from interviews with developers.

As shown in Addendum H, between 2,200 and 4,300 units are projected to be added to the Central Oahu and Ewa districts over the next 10 years. Given the aggregate demand for about 5,600 units, there will continue to be an undersupply of new housing in the region.

MARKET ASSESSMENT
FOR EWA GENTRY UNITS

The market outlook for Group II and higher priced units in Ewa Gentry is good. The projected housing requirement in Ewa and Central Oahu is expected to remain relatively strong, and Gentry has demonstrated an ability to compete at the high end of the housing market (Waialae Iki 5) as well as the more affordably priced end of the market. Because of proximity, the most competitive future inventory would be:

- West Loch Estates
- Waikele
- Village Park.

Unit Sizes and Prices

Average sales prices for Ewa Gentry single-family, Group II units in the $140,000 to $160,000 range in 1988 dollars would be reasonable based on the current and projected sales prices of competitive developments after adjustment for location and project amenities. For single-family units fronting the golf course, prices in the $160,000 to $200,000 range in 1988 dollars would be reasonable.

Unit prices would vary based upon unit size and design, and lot topography, views, and size. The selling prices would range from about $130,000± for small (900ᵮ) 3-bedroom, 1-1/2-bath units on minimum sized lots to in excess of $200,000 for large (1,800ᵮ) 3- and 4-bedroom, 2+-bath units on the large golf course frontage lots.

Absorption

A review of recent absorption rates experienced in comparable residential developments reflect annual sales volumes of 100 to almost 400 units annually. The absorption rates experienced in Mililani, Waipio by Gentry, Village Park, and Makakilo over the recent past ranged from 100 to 400 units per year. Sales of single-family and multi-family units in Ewa and Central Oahu are summarized in Addendums I and J, respectively.

Competition for buyers who could qualify for Group II or higher priced units will increase in the future because of the increased number of master-planned developments in Ewa and Central Oahu. These units permit higher profit margins and are therefore the most desirable to build. The actual sales performance in Ewa Gentry would depend on the design, timing, pricing, and financing offered for comparable units at West Loch Estates, Waikele, and Village Park.

Ewa Gentry's estimated market share could range from 15% to 20% of the projected new housing requirement for Ewa, and could range from

about 150 to 200 units annually, depending on the type of units, pricing and marketing efforts, and competitive inventory available. Addendums I and J indicate the historical market shares of single-family and multi-family unit sales Gentry Development Company has captured.

Unit Mix

If possible and economically viable, presales prior to construction would allow the buyer to select specific unit types to be built. As a result, the unit mix would reflect current market demand. However, if the unit mix must be predetermined, a mix of about 70% three-bedroom, and 30% four-bedroom units would be recommended based on current market trends.

IV - GOLF COURSE ASSESSMENT

This section discusses the market support for the proposed Ewa Gentry Golf Course in terms of the market area, demand analysis, and existing and proposed golf course facilities.

MARKET AREA

The market assessment is based on an evaluation of the supply and demand for golf courses on Oahu, with a focus on the Ewa, Central Oahu, and Primary Urban Districts. Because most of the support for the course is expected to come from residents and visitors within a reasonable travel time-distance, the island was divided into primary and secondary market areas. The primary market area is defined as Ewa, Central Oahu, and Urban Honolulu, as shown on the map included as Exhibit IV-A.

ANALYSIS OF HISTORICAL AND PROJECTED DEMAND FOR GOLF PLAY

The two major market segments supporting golf courses on Oahu are local residents and island visitors. The demand for golf by these two market segments is expressed in terms of daily or annual rounds of golf played.

The rounds of golf to be played is projected based on the forecasted resident and visitor population and the average golf rate per capita which are discussed under the following subheadings.

Resident Population Demand

The primary market area currently includes about 614,334 residents, or about 73% of Oahu's resident population. The area also includes virtually all of the major retail, commercial, transportation, and visitor facilities for the island. Based on the City & County of Honolulu development plans, the primary market area is designated as the area to accommodate the majority of the island's future residential growth. Addendum K projects resident population for Oahu and the primary market area.

The development of Ko Olina Resort, the Deep Draft Harbor, and a secondary urban center in Ewa, will create job opportunities for the additional 60,350 residents projected to be attracted to Ewa and Central Oahu by the year 2005. By 2005, the primary market area is projected to increase by 88,600 residents, or about 78.6% of Oahu's projected increase of 112,800.

EWA GENTRY
Geographic Boundaries of the Primary Market Area

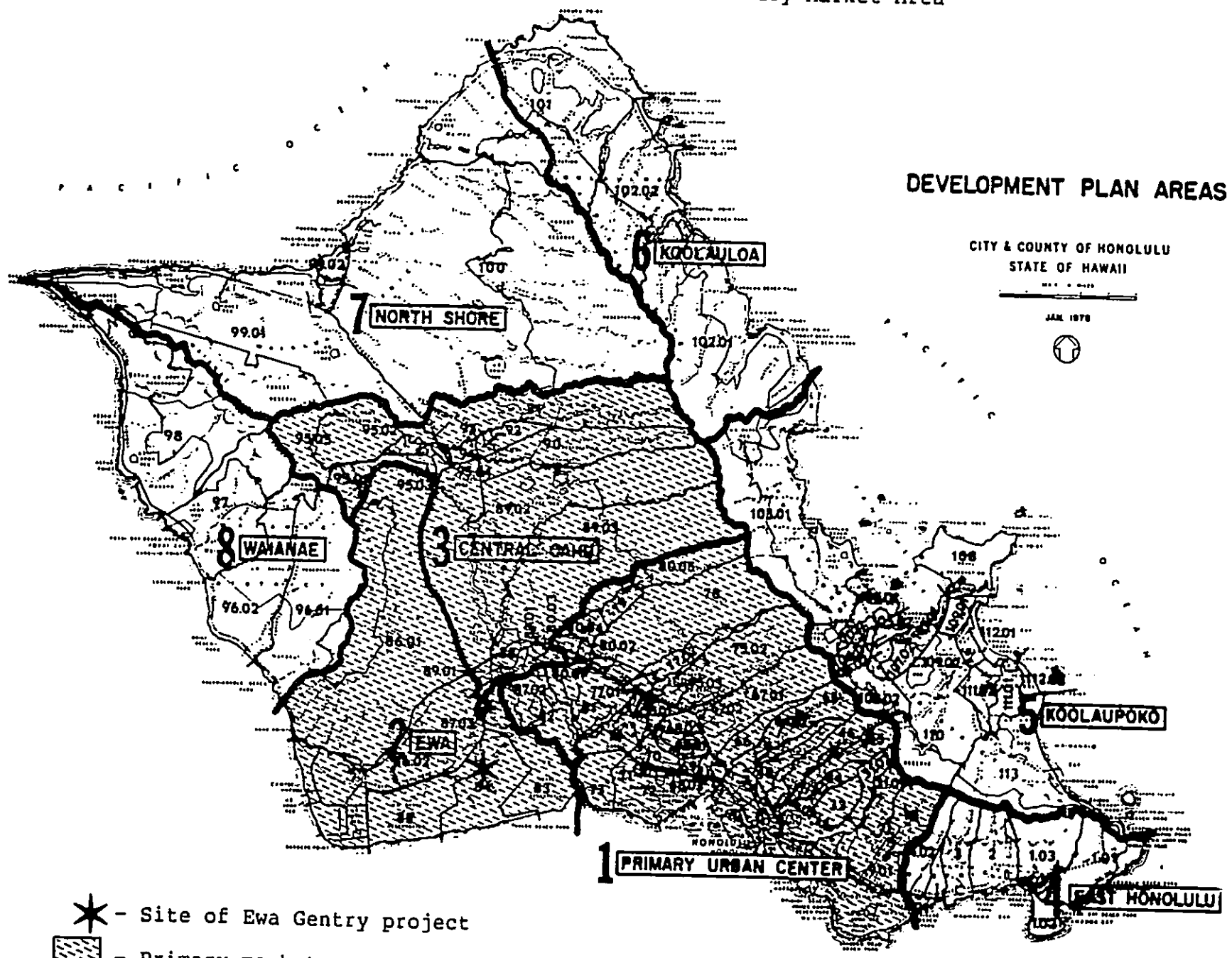

Exhibit IV-A

The primary market area resident population is projected to increase by about 7,000 per year through 1990, 6,200 per year between 1990 and 1995, and only about 4,300 per year for the next 10 years. The rate of growth in resident population for Oahu and the primary market area is projected to slow primarily because of an anticipated slowing in the rate of growth of the visitor industry, the State's primary source of economic growth.

Military Personnel and Their Dependents

Military personnel and their dependents account for about 124,500 residents or about 15% of Oahu's resident population. There are nine military golf courses on Oahu, or about 32% of the total number of golf courses on the island.

Visitor Demand

The projection of average daily census on Oahu are based, in part, on the Statewide visitor industry. Trends in the State of Hawaii, Oahu, and the primary market area are discussed under the following subheadings.

Statewide

Visitor arrivals to the State totaled nearly 5.8 million in 1987, an increase of 3.3% over 1986. Of the total, about 4.2 million were westbound visitors and about 1.6 million were eastbound visitors.

The eastbound visitor arrivals, particularly Japanese visitors who represent about 67% of this segment, have developed into an increasingly important component of the visitor industry. Since 1980, eastbound arrivals have increased by about 8.7% per year while westbound arrivals have increased by only about 4.7% per year.

The importance of the eastbound market segment was underscored in 1987 when an increase in eastbound arrivals more than offset a 1.4% decline in westbound arrivals, and helped post a 3.3% net gain in total arrivals over the previous year.

The Hawaii State Department of Business and Economic Development (DBED) recently revised State and County visitor industry projections. The revised estimates (Series M-K) project visitor arrivals from Japan will increase from about 20% of total arrivals in 1990 to 25% by 2005.

Based on the DBED Series M-K projections, total Statewide arrivals are projected to increase from 6.6 million in 1990 to 10.2 million by 2005. The average daily visitor census is projected to increase from 116,700 in 1985, to 161,700 in 1990, and almost 245,000 by

2005. Addendum L projects average daily visitor census for the State, Oahu, and the primary market area.

Oahu

Oahu currently attracts the majority of the visitors to Hawaii. However, over the past decade Oahu's share of the visitors has declined with the development of the neighbor islands' visitor industries. The neighbor islands will attract an increasing share of the State's visitors, and Oahu's share will decline below 50% by 1996, as shown in Addendum L.

Despite a declining share, Oahu is still projected to attract increasing numbers of visitors for the foreseeable future. The average daily visitor census on Oahu is projected to increase from a current level of about 81,000 to 87,300 by 1990, and to 110,200 by the year 2005.

Primary Market Area

Almost 96% of the visitor hotel and condominium units on Oahu are located in the primary market area, based on the January 1988 Hawaii Visitors Bureau (HVB) inventory. Therefore, the analysis estimates 96% of the average daily visitor census on Oahu is present in the primary market area.

The current 77,800 average daily visitor census in the primary market area is projected to increase to 83,800 by 1990, and 105,800 by 2005.

Projected Rounds of Golf

The demand for annual rounds of golf projected for Oahu is based on the anticipated rate of golf participation by island residents and visitors over the foreseeable future.

In 1978, the State Comprehensive Outdoor Recreation Plan (SCORP) conducted resident and visitor surveys to obtain daily participation rates in a variety of recreational activities. [1] Based on this survey, the "demand day," the day of peak participation was calculated for each County by type of recreation activity. For Oahu, the 1980 "demand day" estimated a total of 11,714 residents and visitors would play a round of golf.

Participation rates varied by island. On Oahu, the participation rate was estimated at 2% for residents and 1% for visitors. In 1980 Oahu had a resident population of 764,800 and a daily visitor census of 66,680. If 1% of the average daily visitor census on

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[1] State Department of Land and Natural Resources, State Recreation Functional Plan Technical Reference Document and State Comprehensive Outdoor Recreation Plan, December 1985.

Oahu in 1980 played a round of golf, then about 667 rounds, or 5.7% of the demand day total were attributed to visitors. Therefore, the balance or 11,047 rounds were attributed to residents. This indicates that about 1.44% of the Oahu resident populatien would play a round of golf on the demand day. This is conservative in comparison to the 2% participation rate concluded in the SCORP study.

Projected Resident Demand

Demand for resident golf participation is anticipated to increase in the future because of current trends on Oahu reflecting increasing leisure time and life expectancies, an increasingly active retirement community, and a significant number of additional golf courses proposed for development in the near future. The Maui County participation rate of 4% estimated in the SCORP study is an indication of the level of future participation which may be achieved on Oahu. However, for the purposes of this analysis, a conservative demand day rate of only 1.45% is used to estimate demand for resident golf play.

Projected Visitor Demand

Visitor participation rates for golf play is also anticipated to increase over the 1% level estimated for 1980. The Japanese visitor typically plays more golf than the westbound visitor, and current HVB projections indicate the Japanese visitors will represent an increasingly larger share of the visitors to Hawaii. In addition, a number of Japanese groups are planning semi-private golf courses which would include memberships sold in Japan. These golf course developments would cater to a different group of visitor, one who visits Oahu for the primary reason of playing golf. As such, the visitor golf participation rate on Oahu is projected to increase from 1.0% in 1988 to 2.0% by 2005.

Total Daily Projected Demand

Based on the projected resident population, average daily visitor census, and the participation rates concluded above, the demand for daily rounds of golf on Oahu is estimated to have increased from 11,714 rounds in 1980 to a current level of about 13,000 rounds. By the year 2005, demand for over 16,300 daily rounds is projected. Addendum M projects demand for daily rounds of golf on Oahu.

The primary market area is estimated to capture about 74% of the current daily golf demand on Oahu with demand for about 9,700 rounds. Golf demand in the primary market area is projected to increase to about 12,500 daily rounds by 2005. Addendum N projects demand for daily rounds of golf in the primary market area.

Annual Projected Demand

Daily rounds are converted into annual demand by multiplying by 350 days, the estimated number of playing days in a year. A survey of

private and municipal golf courses indicated the number of playable golf days is limited by weather and holidays. The largest number of playable days lost is due to bad weather, and varies by location and type of course.

Municipal courses on the Windward side, like Pali Golf Course, have only about 320 playable days per year. In comparison, the Ala Wai Golf Course had 360 playable days last year. The five non-playable days included two days closed for holidays, and three days closed because of rain.

Like the municipal courses, only one or two days of golf is lost to holidays. The Hawaii Kai Golf Course does not close for any holiday, and only closed once during the past 12-month period because roads leading to Hawaii Kai were blocked. The Moanalua Golf Course was open every day but New Year's Day last year. However, like the Pali Golf Course, Olomana was closed for almost two months last year because of rain.

For the purpose of this analysis, an average of 350 playable days is reasonable for the majority of the golf courses on Oahu. This estimate is conservative for the primary market area because there is less rain on the Leeward side of the island. Based on 350 playable days per year, current demand on Oahu and in the primary market area is estimated at 4,555,250 and 3,390,100 rounds per year, respectively. Annual demand by 2005 is projected to increase to about 5,720,000 and 4,385,000 rounds on Oahu and in the primary market area, respectively. Addendum O projects annual demand for rounds of golf for Oahu and the primary market area from 1988 to 2005.

EXISTING AND PROPOSED GOLF COURSE FACILITIES

There are 28 golf courses on Oahu. Five of the courses are 9-hole courses, and the rest are 18-hole courses. Over the next 10 years, 16 additional courses are proposed for development on Oahu. This section reviews the existing and proposed golf courses on Oahu and in the primary market area.

Existing Golf Courses

The 28 existing golf courses are categorized into five types of courses summarized as follows:

Oahu Golf Courses

Type	Number	Course clientele
Military	9	Military and guests
Municipal	4	Public
Daily-fee	8	Public
Resort	3	Hotel guest and public
Private	4	Members and guests
Total	28	

Addendum P summarizes the 28 courses by type, name, location, and size. One-half of the total or 15 courses are located in the primary market area. The 15 courses include four of the eight daily-fee courses, six of the nine military courses, two municipal courses, three of the four private courses, and no resort courses.

Military Courses

Play on military courses is restricted to military personnel, their families, and guests. Green fees on military courses range from about $5.00 to $8.00 per round of golf. In comparison, municipal courses charge $4.00 to $6.00 per round, and private daily-fee courses charge $20.00 to $35.00 per round. Because of the number of military golf courses on Oahu, and the comparatively modest cost to play on these courses, most military personnel and their dependents would probably play on military courses.

Because of the number of military personnel and dependents playing on these courses, and a priority system which gives preference to military personnel over guests, there is little opportunity for the public to play on these courses. No plans have been announced to expand these courses; and the annual rounds of play on these courses have not changed significantly in recent years.

Rounds of Play

The National Golf Association indicates the national average for an 18-hole course is 30,000 rounds per year, with municipal courses averaging 50,000 rounds per year. On Oahu, the 9-hole courses average over 40,000 rounds per year, and the 18-hole courses range from 50,000 to 200,000 rounds and average almost 90,000 rounds per year. Oahu has a significant undersupply of golf courses as evidenced by the high volume of play.

The number of rounds played on a course varies by the type and size of course. The highest number of rounds per year are experienced in the municipal courses. Last year, between 140,000 and 200,000 rounds were played on the 18-hole municipal courses. In comparison, the daily-fee and military courses had between 80,000 and 90,000 rounds, private courses had 45,000 to 75,000 rounds, and the resort courses had less than 60,000 rounds. Addendum Q

summarizes the annual rounds of play by golf course for 1986 and 1987.

The difference in amount of play is because of different attitudes in course management. The objective for the municipal course operator is to ensure that the maximum number of players can play the course. This is accomplished by low green fees, dawn to dusk play, and minimal delays between golfing foursomes. At the Ala Wai Golf Course, each foursome is separated by only six minutes.

At the opposite end of the spectrum, the objective of the resort and private courses is to ensure their clientele get the maximum enjoyment from their round of golf. As such, a more leisure pace is maintained.

The military course operators indicate the current levels of play are about the maximum number of rounds desired. While more rounds of play could be achieved, the current level of play accommodates most military personnel, their dependents, and guests. Therefore, the operators do not perceive a need to increase play, and play has remained at these levels for the past few years.

Average annual rounds of golf by type of course, and the total annual rounds played on Oahu in 1987 are estimated based on the data collected. The average annual rounds by type of course is estimated for 1988 as follows:

Average Annual Rounds of Golf

Type course	Annual rounds
Military	84,000
Municipal	169,000
Daily-fee	82,000
Resort	54,000
Private	64,000

About 2,219,000 rounds of golf were played on Oahu in 1987, based on the inventory of courses on Oahu and the average annual rounds noted above. Addendum R estimates annual rounds of golf on Oahu in 1987. Based on the inventory of courses in the primary market area, about 1,203,000 rounds are estimated to have been played in the primary market area in 1987. Addendum S estimates 1987 rounds for the primary market area.

Current Supply and Demand Relationship

In comparison to the current estimated island-wide demand for 4.6 million rounds, Oahu's total of 2.2 million rounds indicates a significant undersupply of golf courses. At an average of 90,000 rounds per year for a typical course, the current unfulfilled

demand for about 2.4 million rounds per year on Oahu would support an additional 26 courses. The 1.1 million rounds played in the primary market area represents only 30% of the estimated demand for 3.4 million rounds. At 90,000 rounds per year, the 2.3 million shortfall could support an additional 25 golf courses.

Because of the imbalance of supply and demand, the municipal and daily-fee courses are operating above their desired maximum capacities. Operating at these levels result in:

- Player frustration and dissatisfaction
- Damage to fairways and greens
- Diminished course reputation
- Excess burden on golf course personnel.

Proposed Golf Courses

As a result of the shortage of golf courses, both public and private sectors are proposing to develop more courses throughout Oahu. About 16 new or expanded golf courses, excluding the Ewa Gentry golf course, are proposed for development on Oahu within the next 10 years. Most of the proposed courses are privately owned, daily-fee courses. The City & County proposes to develop three more 18-hole courses and to expand an existing 9-hole course to 18 holes. Ten of the proposed courses would be located within the primary market area. Addendum T summarizes the proposed courses by name, location, type, size, and estimated opening dates.

PROJECTED MARKET SUPPORT FOR GOLF COURSE DEVELOPMENT

If all of the proposed courses are developed as scheduled, three courses would open in 1990, three more in 1991, and eight within the following four-year period. All of the proposed courses would be operating by 1997. Given the existing undersupply of golf courses in relation to demand, and the projected increase in demand because of increasing resident and visitor populations, the 16 proposed courses would not be sufficient to accommodate the demand.

Projected Rounds in Proposed Courses

The proposed courses are projected to accommodate 305,000 rounds of play in 1990, 373,000 more rounds in 1991, and 1,585,000 rounds once all 16 proposed courses are in operation. Addendum U projects the additional annual rounds of golf attributed to the 16 proposed courses from 1990 to 2000.

Addendum U also indicates that an additional 596,000 rounds would be accommodated in five new courses located in the primary market area by 1991. A total of 1,075,000 annual rounds are projected for

- the 10 proposed courses to be added to the primary market area between 1990 and 2000.

Projected Supply and Demand Relationship

Despite the significant number of additional rounds of golf which are projected to be accommodated by the proposed golf courses, there would still be an annual unfulfilled demand for 1.4 million rounds of golf on Oahu in 1995, and unfulfilled demand would increase to 1.9 million by 2005. Addendum V projects annual demand and supply for Oahu from 1985 to 2005. Exhibit IV-B graphically shows the supply and demand relationship on Oahu.

The same relative levels of unfulfilled demand are projected for the primary market area. As shown on the graph included as Exhibit IV-C, the current unfulfilled demand for 2.2 million rounds in the primary market area is projected to decrease to about 1.7 million rounds by 1995 if all of the proposed golf courses, excluding the Ewa Gentry course, are built. However, the growing resident and visitor population would create additional demand which would increase the projected unfulfilled golf demand to about 2.1 million rounds by 2005. Addendum W projects annual demand and supply for the primary market area from 1985 to 2005.

Assuming an average golf course would accommodate 90,000 rounds per year, between 17 and 18 additional golf courses would still be needed on Oahu and in the primary market area in 1995, the year with the lowest level of unfulfilled demand in the projection period.

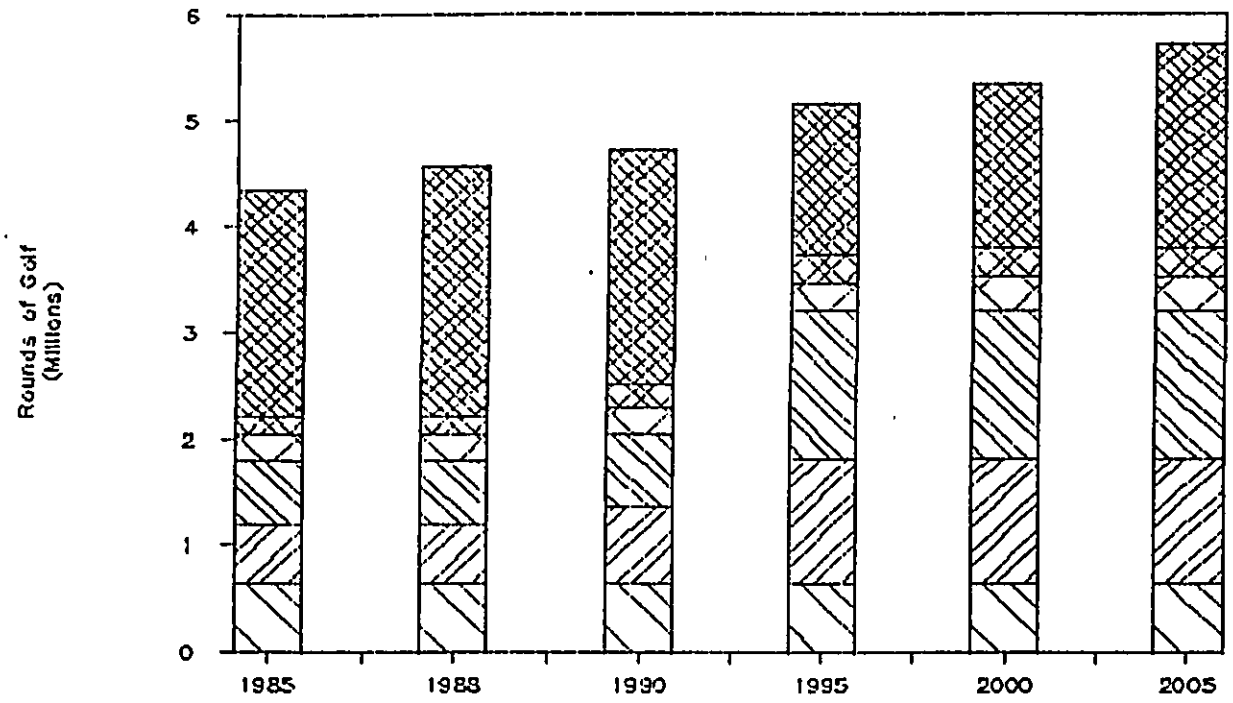
SUPPORT FOR THE EWA GENTRY GOLF COURSE

With the significant undersupply of golf courses on Oahu and in the primary market area, and a projected unfulfilled demand for 17 more golf courses in addition to those proposed, the Ewa Gentry golf course would have strong market support provided its design and fee structure are competitive. The proposed course would be a privately owned course with limited public play. The Ewa Gentry course would be able to achieve 60,000 to 70,000 rounds per year.

The Ewa Gentry golf course would attract players from throughout the primary market area, with most of resident players coming from the area Ewa of Red Hill. Although the majority of the players would be residents, visitors staying at the Ko Olina Resort could also choose to play the Ewa Gentry course.

Exhibit IV-B

EWA GENTRY
Projected Supply and Demand
Oahu

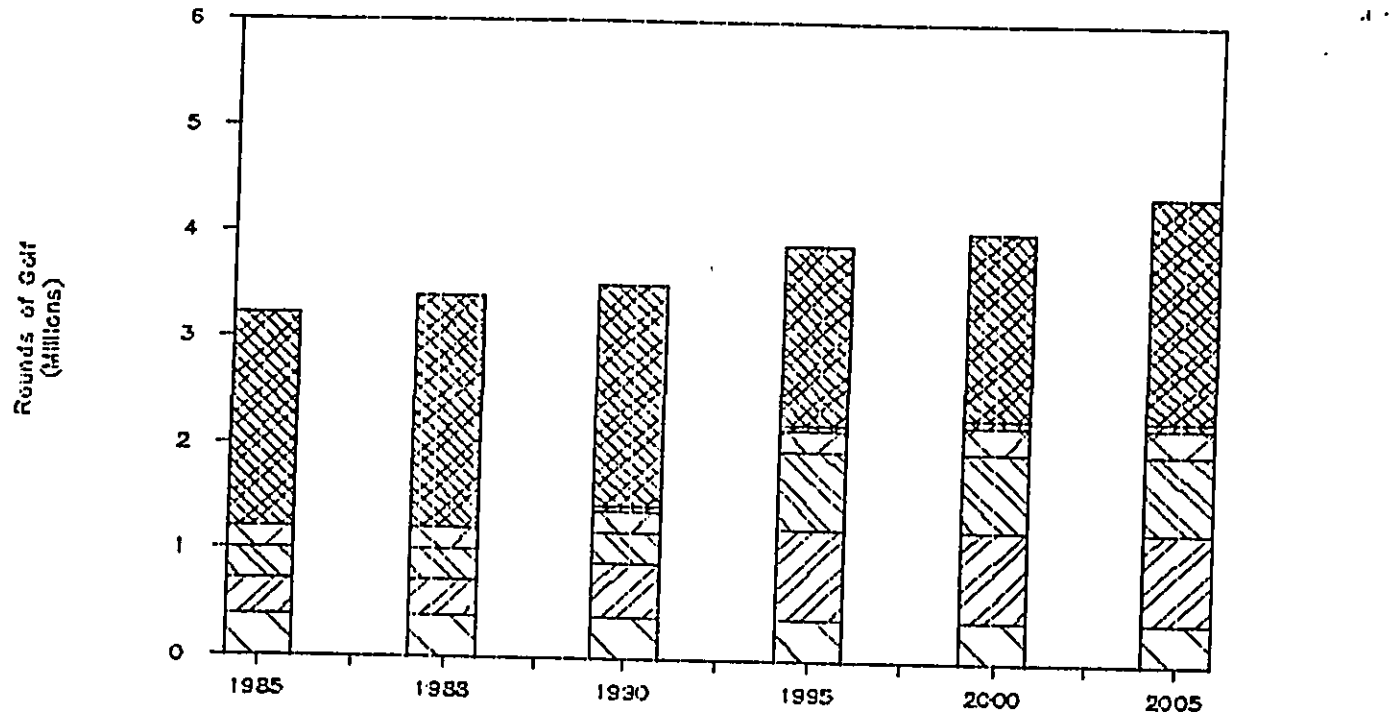


Legend:

- Unfulfilled Demand
- Resort
- Private
- Daily-fee
- Municipal
- Military

Exhibit IV-C

EWA GENTRY
Projected Supply and Demand
Primary Market Area



EWA GENTRY
Gap Group Income and Pricing Levels
Oahu - 1988

Number of persons in household	Median		80% of Median		120% of Median		140% of Median	
	Income	Maximum sales price	Income	Maximum sales price	Income	Maximum sales price	Income	Maximum sales price
2	$29,187	$ 88,963	$23,350	$ 68,640	$35,024	$109,286	$40,862	$129,676
3	32,875	101,804	26,300	78,911	39,450	124,697	46,025	147,468
4	36,500	114,426	29,200	89,008	43,800	139,843	51,100	165,260
5	38,812	122,476	31,050	95,450	46,574	149,502	54,337	176,380
6	41,062	130,310	32,850	101,717	49,275	158,906	57,487	187,501
7	43,375	138,363	34,700	108,158	52,050	168,568	60,725	198,621
8	45,625	146,197	36,500	114,426	54,750	177,969	63,875	209,741

Source: U.S. Department of Housing and Urban Development, City & County of Honolulu Department of Housing and Community Development, and State of Hawaii Department of Housing Finance and Development Corporation.

ADDENDUM A

EWA GENTRY
Current and Proposed
Competing Group I Projects

Project	Location	Total units	Affordable Group I: Total units	Affordable Group I: Unsold units	Competing unit type	Prices	Start of marketing	Developer or agency	Remarks
Projects Being Marketed or Under Construction									
Mililani Parkway	Mililani	240	240	240	Townhomes	$ 78,000	1988	Mililani Town, Inc.	All units are 2-bedroom/1-bath. Target group low-moderate income.
Kani Kani	Waialua	290	290	290	SFD	100,000-120,000	1988	Oceanic Properties	Project adjacent to Whitmore Village.
Valley Homes	Waiana	119	119	119	SFD	94,990- 98,990	1987	Grance, Inc.	Developer received 30 reservations after one week of marketing.
Honulele	Kaneohe	244	244	0	SFD	96,000-115,000	1987	MHA	Project sold out in three weekends; May 1986.
Malibu Point	Kaneohe	200	200	95	Townhomes	74,000-103,500	1987	Gentry Homes	Project sold about 105 units as of Dec. 1987.
Holani at Waiana [1]	Waiana	147	147	20	SFD	68,400- 74,950	1986	MHA	Project has about 20 units left to sell.
Lollehua Village	Waialua	40	40	0	SFD	95,000- 96,000	1986	MHA	Construction to begin mid-1988.
Acacia	Pearl City	90	90	4	MF	61,800- 71,800	1986	DHCD	Target market was low-moderate income.
Kani Pua Gardens II	Kaneohe	99	99	0	SFD	93,077- 99,500	1986	DHCD	Target market was the gap group.
Villages at Waipio	Waipio	240	240	10	Townhomes	96,000-123,000	1986	Schuler & Assoc.	Project complete, 95% sold.
Lilifaloa	Waipio	150	150	150	Townhomes	96,000-120,000	1988	Schuler & Assoc.	Starts when the Villages project is sold out.
		1859	1859	928					
Planned or Proposed Projects									
Waikele	Ewa	2700	810 [2]	810	Townhomes	Low to market	1988	Amfac Properties	Estimated eight-year development.
NA	Waimanalo	50	50	50	NA	Gap group	1989	MHA	Under consideration.
Napolei Village	Ewa	4871	2923	2923	SFD/Th	Low to market	1989	MHA/DHCD	10-year build out. 50% of gap units are SFD.
Keystone	Waile	502	502	502	NA	Gap group	1989	MHA	No definite plans at this time.
West Loch Phase I	Pearl City	570	315	315	SFD	$110,000-120,000	1989	DHCD	County and Development Plan approvals outstanding.
Waimalu	Waimalu	100	100	100	SFD	Gap group	1990	MHA	Proposed SFD - no definite plans.
Crown	Waipahu	100	100	100	SFD/MF	Gap group	1990	MHA	Proposed SFD/MF/Elderly rentals - no definite plans.
Hono Malunia	Kaneohe	400	400	400	NA	Gap group	1990	MHA	Under consideration.
West Loch Phase II	Pearl City	780	435	435	SFD	$110,000-120,000	1991	DHCD	County and Development Plan approvals outstanding.
Waiawa Ridge	Waiawa	7806	2372	2372	Mixed	Low to market	1991	Gentry Homes	County approvals outstanding.
Mililani Mauka	Mililani	5630	1689 [2]	1089	SFD	$118,000-280,000	1991	Mililani Town, Inc.	Both General and Development Plan approvals from the County are needed
		1010	303 [2]	303	MF	$ 55,000- 69,000			
Napolei Knolls	Ewa	500	500	500	SFD	$160,000	1991	Lusk Company	County and State approvals outstanding.
NA	Kaaawa	1200	NA	NA	MF	Gap to market	NA	City	Conducting preliminary studies.
Kuilima	Kuilima	200	200	200	NA	Gap group	NA	Kuilima Devel. Co.	1988 groundbreaking, master plan not finalized.
		26519	10699	10699					
		28378	12558	11827					
Estimated Allocation:	SFD	14958	6676	6166					
	MF [3]	12268	4730	4309					
	NA	1152	1152	1152					

[1] Project offered two types of financing; Farmers Home Loan and Conventional. The Farmers Home financing was available on only 100 units; the other units had to be financed through coventional loans. The Farmers Home Loan units sold out almost immediately.
[2] Assumes 30% of development will be gap group.
[3] Assumes projects, which have a mix of single-family/multi-family, will be 50% single-family and 50% multi-family.

Source: John Child & Company, Inc. based on public records and interviews with development representatives.

ADDENDUM B

ADDENDUM C

EWA GENTRY
Absorption Rates for Selected
Comparable Group I Projects

Name	Location	Year marketing began	Type	Number of units	Bedroom/ bath	Living area (SF)	Average selling price	Monthly absorption rate
Hokulele	Kaneohe	1986	SFD	242	2/1.5	836	$ 96,000	242 [1]
					3/2	1,150	107,000	
					4/2	1,391	119,000	
Nani Pua Gardens II	Kaneohe	1986	SFD	99	3/1.5	912	97,000 [2]	33
					3/2	1,000		
Leilehua Village	Wahiawa	1986	SFD	40	3/2	1,000	92,000 [3]	40
Hidden Valley Estates								
Increment I	Wahiawa	1983	Low-rise	28	2/1	837	83,500	11.5 [4]
Increment II	Wahiawa	1985	Low-rise	32	2/1	837	83,500	16
Increment III	Wahiawa	1986	Low-rise	60	2/1	837	85,000	10
Increment IV	Wahiawa	1987	Low-rise	34	2/1	837	86,000	34
Newtown Meadows	Newtown	1986	Townhouse	152	2/2	1,150	112,500	76
Holani at Makaha [5]	Makaha	1986	SFD	100	3/1	1,000	70,500	50
				47	3/1	1,000	70,500	2
Kupono	Waipio	1985	Townhouse	120	Studio	434	54,000	7.5
					1/1	484	70,000	
					2/1	716	93,000	
Crosspointe	Halawa		Townhouse		1/1	547-577	76,000-81,000	
					1+loft/2	848	112,500	
					2/1-1.25	716-813	98,000-108,000	
					2/2	810-874	106,500-114,500	
					2/2.5	1,005	130,000	
Selected Increments:		1984		58				29
		1984		46				23
		1985		34				17
		1986		58				29
		1986		40				20
		1986		32				16
		1986		44				22
		1987		44				22
Valley Homes	Makaha	1987	SFD	119	3/2	864-960	96,990	30 [6]

[1] This HHA-assisted project sold out in three weekends. There were 500 applicants, and 200 applicants are now on a waiting list.
[2] Resales are currently averaging $115,000.
[3] Average fee simple price with a lot size of 3,750 SF. This HHA project is currently on hold until land is acquired.
[4] Sales in this leasehold project were slow at first; however, after FHA approval, Increment I units sold out in two months.
[5] Low income HHA project with subsidized Farmers Home Loans on 100 of the 147 units. The remaining 47 units were conventionally financed.
[6] Marketing began December 1987. Developer received 30 reservations after one week. Final HPR will be received in about 2 months.

Source: Public records and interviews with project brokers and representatives.

ADDENDUM D

SELECTED GROUP I DEVELOPMENTS

Hokulele
Nani Pua Gardens II
Leilehua Village
Newtown Meadows
Hidden Valley Estates
Kupono
Crosspointe
Kahi Kani
Soda Creek
Holani at Makaha
Valley Homes

Project name:	Hokulele
Location:	Kaneohe
Developer:	Hokulele Development, Inc.
General description:	Hokulele is a 242-unit, fee simple single-family development
Unit descriptions:	• Lot sizes range from 4,000ft to 10,600ft (some sloping lots) • Units range from 2 bedrooms/1.5 baths to 4 bedrooms/2 baths • Living areas range from 836ft to 1,391ft with additional carport area of 372ft to 433ft.
Price:	$95,000-$119,050
Marketing:	• Began April 1986 • Sold out in 3 weekends • 530 applicants qualified under HHA guidelines • Units are under construction and project build-out is expected to be year end.
Buyer profile:	• Average household income was around $40,000. • Most buyers were first-time buyers in families of three or more persons. • Most buyers were from the Windward area, but many were from other areas on Oahu.

Project name:	Nani Pua Gardens II
Location:	Kaneohe
Developer:	RYM Kaneohe Venture Division of Budget Realty
General description:	Nani Pua Gardens II is a 99-unit, second phase, fee simple, single-family development.
Unit descriptions:	• Lot sizes range from 3,750ft to 5,000ft • Units are 3-bedroom and 1 to 1.5 bath. • Living areas range from 912ft to 1,172ft with additional carport area of 360ft.
Price:	Average $96,000
Marketing:	• Began April 1986 • Sold out in 3 months • 450 applicants; 25% qualified under HHA guidelines • Resales are currently averaging about $115,000.
Buyer profile:	• Maximum household income was $45,000. • 50% of buyers were families of four or more persons. • Most buyers were first time buyers from the Windward area.

Project name:	Leilehua Village
Location:	Wahiawa
Developer:	Hawaii Housing Authority
General description:	Leilehua Village is a proposed 47-unit single-family project to be located in Wahiawa.
Unit descriptions:	• Single-family units on 3,750ft lots • 3-bedroom/2-bath • Living area approximately 1,000ft
Price:	• $79,000 leasehold • $92,000 fee simple
Marketing:	• Began in October 1986 • 184 applicants within 6 weeks • 50% qualified under HHA guidelines • Negotiations for the acquisition of the land have broken off and no definite timetable for completion is available.

Project name:	Newtown Meadows
Location:	Newtown
Developer:	Herbert Horita
General description:	Newtown Meadows is a fee simple townhouse development with 152 two-bedroom, two-bath, upper and lower units.
Unit descriptions:	• Two bedroom/two bath • Approximately 1,100 to 1,200# of living area
Price:	• Range from $105,000 to $120,500.
Marketing:	• Began in January 1986 • Sold out in two months
Buyer profile:	• Buyers were described as new generation families with one child or newlyweds. • Buyers were from the Aiea-Pearl City-Waipahu area. • Annual income was generally greater than $36,000.

Project name:	Hidden Valley Estates
Location:	Wahiawa
Developer:	Hidden Valley Investment
General description:	Wahiawa's Hidden Valley Estates is a leasehold, townhouse project, developed in five increments.
Unit descriptions:	• Two-bedroom/one-bath • 782ft - 812ft living areas
Price:	• Increment I & II - $83,500 • Increment III - $85,000 • Increment IV - $86,000
Marketing:	• Increment I marketing began in 1983. Financing available was Hula Mae and conventional. Five units were sold in 10 months. FHA approval was received and the remaining 23 units sold out in two months. • Increment II marketing began 1985 with 32 units. Sold out in two months. • Increment III marketing began in 1986 with 60 units. Sold out in 6 months. Approximately 50% of these units were bought by investors. These investors then resold them. • Increment IV marketing began in 1987 with 34 units. Sold out in one month. All but four units in this increment were sold to investors, who then resold it. • To date only 6 units remain to be resold.
Buyer profile:	• All of buyers were first time buyers. • Age: late 20's to early 30's; • Couples with one or two children; • Some retired couples;

- Incomes range from $20,000 to $30,000;
- Most buyers came from the Wahiawa area.

Project name:	Kupono
Location:	Waipio
Developer:	
General description:	Kupono is a 120-unit, fee simple townhouse development located in Waipio.
Unit descriptions:	• Studio has approximately 434ft • One-bedroom/one-bath has approximately 484ft • Two-bedroom/one-bath has approximately 716ft
Price:	• Range from $53,000 - $94,500. • Average price by unit type is as follows: -Studio $54,000 -One-bedroom $70,000 -Two-bedroom $93,000
Marketing:	Marketing began in 1985. The absorption rate was 7.5 units per month.
Buyer profile:	• Buyers were primarily singles and couples with no children. • Buyers primarily came from the Pearl City, Waipahu or Honolulu area. • Household incomes ranged from $24,000 to $36,000.

Project name: Crosspointe

Location: Halawa

Developer: Gentry

General description: Crosspointe is a 546-unit leasehold townhouse development.

Unit descriptions:

Model	Stories	Bdrm./ bath	Unit Area (ft) Living	Other	Gross
1	--	1/1	547	90-250	637-797
2	--	1/1	577	195	772
3	2	1+Loft/2	848	100-195	948-1043
4	--	2/1	716	52-290	768-1006
5	--	2/1-1/4	813	190-310	1003-1123
6	--	2/2	810	80-245	890-1055
7	--	2/2	874	160-300	1034-1174
8	2	2/2-1/2	1005	210	1215

Price:

Average prices:
- Model 1: $ 76,000
- Model 2: 81,000
- Model 3: 112,500
- Model 4: 98,000
- Model 5: 108,000
- Model 6: 106,500
- Model 7: 114,500
- Model 8: 130,000

Marketing:

Built in 10 increments since 1984. The last increment is due for completion this year. Project personnel indicated that each 40-50 unit increment sold out in two months.

Buyer profile:

- Typical buyer was either single or married without children.
- Buyers were primarily from the Honolulu area.
- The average household income was between $20,000 and $45,000.

Project name:	Kahi Kani
Location:	Wahiawa
Land area (acres):	50
Developer:	Oceanic Properties, Inc.
General description:	A 290±-unit single-family development. Units to be priced for the "GAP group."
Total proposed housing units:	290±
Price range:	$100,000-$120,000

Unit description:

Model	Bedroom/ bath count	Dwelling Area (ft) Living	Carport/ storage	Total
A	2/1	801	430	1,231
B	3/2	949	433	1,382
B-1	3/2	984	433±	1,417±
C	4/2	1,066	424	1,490

Development schedule:

- All government permits in place.
- Marketing to begin 1988.

Project name: Soda Creek

Location: Ewa

Developer: Gentry Homes, Ltd.

General Description: Soda Creek is the first offering of the Ewa by Gentry Development. It is a fee simple development containing 413 single-family homes.

Unit Descriptions:

Model	Stories	Bdrm./ bath	Unit Area (ft²) Living	Other	Gross
1	One	2/1	802	427	1229
2	One	2/2	945	404	1349
3	One	3/2	1045	422	1467
4	One	3/2	1189	410	1599
5	Two	3/2.5	1368	471	1839
6	Two	4/2.5	1530	522	2052

Price Range:

Original prices (September 9, 1987):
- Model 1: $119,900
- Model 2: 125,500
- Model 3: 128,500
- Model 4: 135,500
- Model 5: 139,500
- Model 6: 144,800

Current sales prices (December 1, 1987):
- Model 1: $121,900
- Model 2: 128,000
- Model 3: 133,900
- Model 4: 143,500
- Model 5: 144,900
- Model 6: 149,900

Development Schedule:

- Project began marketing in September 1987.
- Project sold out in three weekends during the Parade of Homes. After two days of sales, 206 units were sold.

Project name:	Holani at Makaha
Location:	Makaha
Developer:	HHA
General description:	Holani at Makaha is a 147-unit, fee simple, low income, single-family development.
Unit descriptions:	• Lot size 4,000ft to 6,000ft • Units are 3-bedroom/2-bath • Average living area 1,000ft
Price:	• $68,000 - $73,000
Marketing:	• Began in 1986 • Most of the units (100) are financed through Farmer Home loans with interest rate of 1% and 3%. These units sold within two months. • About twenty of the larger units, available through FHA and conventional financing, remain to be sold. • The project official indicated that the distance from downtown and the negative socio-economic status associated with the Waianae Coast were the primary reasons why the project was not sold out.

Project name:	Valley Homes
Location:	Makaha
Developer:	Grenco, Inc.
General description:	Valley Homes is a 119-unit fee simple single-family condominium development.
Unit descriptions:	• Lot sizes 4,000ft - 5,000ft • Units are 3-bedroom/2-bath • Living area is 864ft - 960ft • Each unit will have one covered carport, a second covered carport will be an option.
Price:	• $95,000 - $99,000
Marketing:	• Marketing began during the last two weeks of December 1987. • Final HPR should be complete in about 2 months. • Client received 30 reservations after marketing for one week. Initial review shows most of the reservations were by investors. • Project construction should begin by mid-1988 and be complete by first quarter 1989.

Project name:	Kapolei Knolls
Location:	Ewa
Land area (acres):	80.4
Developer:	Lusk Company
General description:	Kapolei Knolls is a proposed 500-unit single-family residential development.
Unit descriptions:	• Three-bedroom/two-bath and four-bedroom/two-and-a-half bath. • Approximate living area 1,100ft. • Lot size 5,000ft.
Price:	Average $160,000.
Development schedule:	• Land is currently zoned agriculture. Both City and State have to make zoning changes. • Application submitted for Development Plan change. Proposal will be sent to the City Council with a recommendation to approve. The City Council is expected to approve in late 1988. • Application for State Land Use reclassification will be submitted in July 1988. • The developer hopes to have all approvals in place by mid-1990. The first home should be ready in 1991.

EWA GENTRY
Current and Proposed
Group II and Group III Units

Project	Location	Total units	Market Units: Total units	Market Units: Unsold units	Qualifies as Group II Units (120% - 140%) [1]: Total units	Qualifies as Group II Units (120% - 140%) [1]: Unsold units	Competing unit type	Prices	Start of marketing	Developer
Projects Being Marketed or Under Construction										
Mililani										
Unit 60	Central	258	258	0	250	250	SFD	$122,700 - $155,000	1987	Mililani Town, Inc.
Makakilo	Ewa									
Colony Ridge I & II		126	126	13	126	13	SFD	140,000 - 168,000	1987	Finance Realty Co.
Palehua Heights II & III		115	115	115	115	115	Lots [2]	82,000 - 151,000	1988	
Parkside		50	50	3	50	3	SFD	145,000 - 165,000	1987	
Village Park	Central									
Phase 12 & 13		231	231	0	0	0	SFD	135,900 - 145,200	1987	Waitec Dev., Inc.
Subtotal		780	780	131	541	381				
Planned or Proposed Projects										
Makakilo	Ewa	3,000	3,000	3,000	0	0	SFD/MF	75,000 - 190,000	1989	Finance Realty Co.
Mililani										
The Ridge (Islander Models)	Central	327	327	327	0	0	SFD	136,000 - 214,000	1988	Mililani Town, Inc.
The Pinnacle		90	90	90	90	90	MF (TH)	135,000 - 165,000	1989	
Kapolei Village	Ewa	4,871	1,948	1,948	1,948	1,948	SFD/MF	130,000 - 150,000	1989	HHA
Waikele	Central	2,700	1,890	1,890	0	0	SFD/MF	130,000 - 200,000	1988	Amfac
West Loch - Phase I	Ewa	570	255	255	0	0	SFD	130,000 - 190,000	1989	DHCD
Waiawa Ridge	Central	7,906	3,162	3,162	2,372	2,372	SFD/MF	125,000 - 165,000	1990	Gentry-Pacific
Village Park Expansion	Central	3,181	3,181	3,181	0	0	SFD/MF	120,000 - 195,000	1988	Waitec Corp.
Royal Kunia [3]		299	299	299	0	0	SFD	158,000 - 185,000	1988	Waitec Corp.
Ewa Marina	Ewa	4,850	4,365	4,365	0	0	SFD/MF	100,000 - 200,000	NA	Hasegawa-Komuten
								200,000 - 400,000	(ocean frontage)	
West Loch - Phase II	Central	780	345	345	0	0	SFD	130,000 - 190,000	1991	DHCD
Mililani Mauka	Central	6,640	3,320	3,320	1,328	1,328	SFD/MF	55,000 - 280,000	1991	Oceanic Properties
Puuloa Estates	Ewa	315	315	315			SFD	Not available	NA	Lusk
Subtotal		35,529	22,497	22,497	5,738	5,738				
Total		36,309	23,277	22,628	6,279	6,119				

[1] Units placed in this category have been designated by the developer as being in the Affordable Group II category.
[2] Vacant lots.
[3] Royal Kunia is a part of the Village Park Expansion.

Source: John Child & Company, Inc. based on public records and interviews with development representatives.

ADDENDUM E

SINGLE-FAMILY ABSORPTION RATES FOR SELECTED MAJOR RESIDENTIAL PROJECTS

Name	Land tenure	Year marketing began	Number of units	Bedroom/bath	Living area (sf)	Lot area (sf)	Selling price	Monthly absorption rate
Mililani								
Traditional	Fee simple	1986	98 [1]	3/2-5/2.5	1,250-2,100	6,000- 7,000	$160,000-$219,000 [2]	8
New Design	Fee simple	1986	215 [1]	2/1-4/2	760-1,240	4,000- 5,000	115,000- 164,000 [2]	18
Village Park								
Phase 7	Lease	1986	198	3/2-4/2	1,022-1,378	3,800-10,000	130,000- 140,000 [3]	25 [4]
Phase 8	Lease	1986	153	3/2-4/2	1,022-1,378	3,800-10,000	130,000- 140,000 [3]	25 [4]
Phase 10	Lease	1987	140	3/2-4/2	1,022-1,378	3,800-10,000	130,000- 140,000	20
Makakilo								
Colony Ridge Phase I	Fee simple	1986	80	3/2	1,560-1,759	5,000- 8,760	140,000- 168,000	7
Colony Ridge Phase II	Fee simple	1987	25	3/2	1,560-1,759	5,000- 8,760	140,000- 168,000	8 [5]
Waipio by Gentry								
Lusna	Fee simple	1984	197	3/2-4/2.5	780-1,606	3,500 [6]	115,000- 158,000	16

[1] Number of units is actually number of sales closed in 1986.
[2] Based on Mililani 1986 Purchaser Profile Report, the average sales price for the Traditional and New Design Home is $174,348 and $138,595, respectively.
[3] Price range given by Sales & Development Manager - Village Park.
[4] Estimated absorption rate provided by Sales Manager for Village Park.
[5] Realtor expects these to be sold out in the next few months.
[6] Average lot size.

Source: Conversations with Sales Managers for projects and sales brochures.

ADDENDUM F

ADDENDUM G

MAJOR COMPETING RESIDENTIAL DEVELOPMENT IN EWA AND CENTRAL OAHU

Ewa

Makakilo
Kapolei Village
West Loch Estates
Puuloa Estates
Ewa Gentry Development
Ewa Marina
West Beach

Central Oahu

Mililani
Mililani Mauka
Waikele
Village Park
Waiawa Ridge
Gentry-Waipio

Project name:	Makakilo
Location:	Ewa
Land area (acres):	1,800.00
Developer:	Finance Realty Company, Limited
General description:	This master-planned community includes multi- and single-family residences, recreational, commercial, conservation and public land uses.
Total proposed housing units:	3,000
Price range:	• Single-family homes $119,000-$190,000 • Multi-family homes $75,000-$90,000
Development schedule:	• Total of 3,000 units are able to be constructed without the need of further zoning approval. • An absorption of 250 units per year is projected by the developer. • Variety of housing units include garden apartments, single-family homes and townhouses.

Project name:	Kapolei Village
Location:	Ewa
Land area (acres):	840.00
Developer:	Hawaii Housing Authority and Department of Housing and Community Development
General description:	The Kapolei Village Master Plan includes: • 4,871 single- and multi-family residences, including 2,923 group housing and 150 elderly rental units • schools • parks • shopping centers • an 18-hole golf course
Total proposed housing units:	4,871
Price range - Market: GAP group:	• Single-family homes $130,000-$150,000 • Single-family homes $115,000 • Multi-family homes $65,000
Development schedule:	• State land use reclassification from Agricultural to Urban use and necessary County zoning approvals are outstanding. • A September 1988 commencement date is scheduled. • The Master Plan completion is expected 15 years from commencement. • State Land Use Commission approved the project on June 29, 1988.
Developer's projected absorption:	• 500 units in 1989 • 400 units in 1990 • 400 units in 1991

Project name:	West Loch Estates
Location:	Ewa
Land area (acres):	400.00
Developer:	Department of Housing and Community Development
General description:	The West Loch Estates preliminary Master Plan includes: • 1,500 residential units • 18-hole golf course • Shoreland park • Neighborhood parks • School and child care facility
Total proposed housing units:	1,500
Price range:	Lot pricing: • Gap group – $45,000 • Market interior – 65,000-$ 70,000 • Market view – 90,000- 100,000 Various builders will be developing the house and lot packages. Package prices are estimated as follows: • Gap group units - $110,000-$120,000 • Market units – 130,000- 190,000
Development schedule:	Phase I - • 315 gap group units • 255 market units • Projected construction to start mid-1988 • Projected marketing in mid-1989 • Projected absorbtion of 240 gap group units and 200 market units per year.

Phase II -

- 435 gap group units
- 345 market units
- 150 elderly apartments
- 3.6-acre commercial site
- Projected construction to start in mid-1990
- Projected marketing in mid-1991
- Same projected absorbtion rates.

Project name:	Puuloa Estates
Location:	Ewa
Land area (acres):	126.00
Developer:	Lusk
General description:	About 51 acres proposed for the development of 300 to 330 residential units in addition to a public park.
Total proposed housing units:	300-330
Price range:	Not available.
Development schedule:	• State land use classification is currently Urban. • County approval for rezoning lands from Agricultural to Residential use is needed.

Project name:	Ewa Gentry Development
Location:	Ewa
Land area (acres):	1,016
Developer:	Gentry Homes
General description:	Ewa Gentry Development has proposed a total of 7,550 residential units. The first offering of units from Ewa Gentry Development was 413 single-family homes called Soda Creek (please see separate write-up).
Price range:	• Single-family: $120,000-150,000 • Multi-family: 60,000-110,000
Development schedule:	• The next offering will be 250 multi-family units. The multi-family units are in the planning stage. • The required zoning for the 250 multi-family units has been received from the City. • An application to the State Land Use Commission for land reclassification of 685 acres from Agriculture to Urban will be made in July 1988.

Project name:	Ewa Marina
Location:	Ewa
Land area (acres):	1,100.00
Developer:	Hasegawa-Komuten (in discussion)
General description:	The Ewa Marina Community Master Plan includes: • 4,850 residential units on 476 acres. • 485 residential units dedicated to affordable housing. • 1,600 slip marina encompassing about 98 acres. • 55 acres of commercial and marina support area. • 24.5 acres of park.
Total proposed housing units:	4,850
Price range:	• Majority of units to be priced at $100,000-$200,000. • Lower density, ocean frontage units $200,000-$400,000.
Development schedule:	• 186 acres have required land use and zoning approvals.

Project name:	West Beach
Location:	Ewa
Land area (acres):	642.00
Developer:	Herbert Horita
General description:	The preliminary West Beach Master Plan includes:

	Acres
1,500 low-density apartments	108.00
3,700 medium-density apartments	78.90
4,000 resort condominiums	86.50
2 commercial sites	17.80
Beach club space	2.20
Hawaiian cultural center	21.80
Marina with 500 slips for boats	36.30
4 man-made lagoons	13.10
18-hole golf course	170.50
4 parks	51.40
Elementary school	6.90
Transit stations	2.70
Access and circulation	46.10

Total proposed housing units:	9,200
Price range:	Not available.
Development schedule:	• All State land use and County approvals have been obtained. • The development is under construction, and a commencement date of 1989 for residential projects is projected by the developer.

Project name: Mililani

Location: Central Oahu

Land area (acres): 3,500

Developer: Mililani Town, Inc.

General description: This master-planned fee simple residential community is located 20 miles from downtown Honolulu. It is the largest planned community on Oahu. It has single-family as well as multi-family residences, recreational, commercial and public land uses.

Total proposed housing units: Approximately 17,000

Unit description:

Unit type	Lot area (ft²)	Net area (ft²)	Lanai/ other area (ft²)	Gross area (ft²)	Bdrm./ bath	Asking price range
Executive	9,000-10,000	2,500-2,650	400-420	2,900-3,070	4/2-2.5	$249,000-$316,000
Traditional	6,000-7,000	1,250-2,100	360-400	1,610-2,500	3/2-5/2.5	160,000- 219,000
New design	4,000-5,000	760-1,240	360-400	1,120-1,640	2/1-4/2	115,000- 164,000
Islander	4,848-7,876	765-1,930	N.A.	---	2/1-4/2.5	136,000- 214,000
Lots (vacant)	8,704-13,916	---	---	---	---	140,000- 150,000

Development schedule:

- Only three more projects with a total of 657 units remain to be developed. The projects are summarized as follows:

  - The Mililani Parkway is a 240-unit multi-family

development targeted to the low to moderate income group. Marketing is tentatively set to begin late 1988.

- The Ridge is a 327-unit single-family development. Marketing to begin late 1988.

- The Pinnacle is a 90-unit townhome project. Marketing to begin 1989.

Buyer profile:

- Information taken from the 1986 Purchaser Profile Report.

	Traditional	New design
• Average income (combined husband & wife)	$49,368	$38,136
• Number of household members	3.03	2.93
• Previous residence:		
Mililani	43%	27%
Honolulu/Waikiki	19%	28%
Waipahu/Crestview	11%	14%
Aiea/Salt Lake/Pearl City	9%	14%
• Age:		
Husband	35	30
Wife	32	28
• Place of employment:		
Honolulu/Waikiki -		
Husband	49%	50%
Wife	54%	58%
Aiea/Salt Lake/Airport -		
Husband	15%	16%
Wife	22%	14%
Pearl Harbor/Hickam -		
Husband	18%	10%
Wife	1%	6%

Project name:	Mililani Mauka
Location:	Mililani, Central Oahu
Land area (acres):	1,200.00
Developer:	Oceanic Properties, Inc.
General description:	The Mililani Mauka Development Plan includes: • 5,630 single-family residences from luxury homes to zero lot line and cluster developments. • 1,010 low-density apartment and townhouse units. • 10% subsidized residences. • Commercial area with schools, recreational centers and churches. • University of Hawaii's West Oahu College campus. • A 20- to 30-acre site for senior citizen facilities.
Total proposed housing units:	6,640
Price range:	• Single-family homes $118,000-$280,000 • Multi-family homes $55,000-$69,000
Development schedule:	• Both General and Development Plan approvals from the County are needed. • State Land Use Commission has reclassified 723 acres from Agriculture to Urban use. The State required that 30% of the homes be priced so that they are affordable to families earning between 80%-120% of median income. An additional 20% must be affordable to those earning between 120%-140%.

Project name:	Waikele
Location:	Waipahu, Central Oahu
Land area (acres):	577.20
Developer:	Amfac, Inc.
General description:	The Waikele Master Plan includes: • 2,700 residential, multi-family units • 25-35% units dedicated to low-to-moderate income families • 14.5-acre village commercial center • 50-acre office-business park • 25-acre community recreation center • an elementary school • a par-72 golf course.
Total proposed housing units:	2,700
Price range:	• Single-family homes $130,000-$200,000 • Multi-family homes $100,000-$130,000
Development schedule:	• General and Development Plans have been approved by the County. • Zoning approval has been obtained. • Groundbreaking scheduled for 1988. • Offsite improvements will be done by Amfac, Inc. • A developer will be sub-contracted. • An absorption of 340 units per year is projected by Amfac, Inc.

Project name:	Village Park (Expansion)
Location:	Waipahu, Central Oahu
Land area (acres):	691.50
Developer:	Halekua Development, Inc.
General description:	The Village Park Master Plan includes: • 3,480 residential, multi- and single-family units • 30 acres dedicated to subsidized housing • 28.7 acres for commercial and light industrial use • a shopping center • elementary schools • recreational facilities • an 18-hole golf course
Total proposed housing units:	3,480
Price range:	• Single-family homes $120,000-$195,000 • Multi-family homes $90,000-$110,000
Development schedule:	• The State Land Use Commission has reclassified the 691.50 acres for Urban use. • County has approved the General and Development Plans for Phase I (100 acres). • County Department of Land Use zoning was approved for Phase I (100 acres). • County approvals on remaining 591 acres being pursued. • An increase in the population ceiling is required for the Central Oahu Development Plan area prior to approval by the City of the remaining acreage.

Project name:	Waiawa Ridge
Location:	Waiawa, Central Oahu
Land area (acres):	1,395.00
Developer:	Gentry Pacific, Ltd.
General description:	Master-planned community includes single- and multi-family residential units.
Total proposed housing units:	8,000
Price range:	• Single-family homes $125,000-$165,000 • Multi-family homes $60,000-$100,000
Development schedule:	• Development Plan designation on only a portion of parcel is approved. • County zoning approvals outstanding. • Commencement scheduled for 1990. • Absorption is projected at 400-500 units per year. • A 16-year build-out is projected. • The State Land Use Commission gave conditional approval to the project except for area around wells. Final approval is pending a report by the Department of Health on the effects this project will have on the water quality in the Waiawa shaft.

Project name:	Gentry-Waipio
Location:	Waipahu, Central Oahu
Land area (acres):	510.00
Developer:	Thomas Gentry
General description:	The Gentry-Waipio Development Plan includes:

	Acres
1,700 single-family residences	193
1,500 low-density apartments	75
1,500 medium-density apartments	10
Light industrial use	120
Commercial site	14
Public facilities	24
Open space	34
Right-of-way	40

Total housing units: 4,700

Price range:

- Single-family homes $116,000-$150,000
- Multi-family homes $70,000-$90,000

Development schedule:

- Project is completely developed and sold.
- Project experienced average annual sales of 300-400 units.

EWA GENTRY

Proposed Housing Supply and Demand Relationship in Ewa and Central Oahu

Project	Unit type	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Indefinite	Total
Projected demand																					
Affordable Group I		3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000		54,000
Group II & market		2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600		46,800
Total demand		5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600		100,800
Proposed supply																					
EWA:																					
Gentry-Fort Weaver	SFD	213	200																		413
Makakilo	SFD & MF	250	250	250	250	250	250	250	250	250	250	250	250								
Kapolei Village	SFD & MF			500	300	300	300	300	300	300	300	300	300	300	300	300	300	300	171		3,000
West Loch Estates	SFD		440	130	440	340															4,871
Ewa Gentry	SFD	410	340	600	760	480	600	530	170	160											1,350
Ewa Gentry	MF	300	440	260	270	500	310	360	600	460										330	330
Ewa Town Center	SFD & MF																				4,050
Ewa Marina	SFD & MF	-			300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		3,500
West Beach Estates	MF			200	200	200	200	300	300	300	300	400	400	400	400	400	400	400	400	350	N.A.
Kapolei Knolls	SFD			100	100	100	100	100													4,850
																					5,200
CENTRAL:																					
Militani	SFD	327																			500
Militani	MF	60	270																		327
Militani Mauka	SFD				300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		330
Militani Mauka	MF			100	100	100	100	100	100	100	100	100	110							1,130	5,630
Waiawa	MF	340	340	340	340	340	340	340	320												1,010
Village Park	SFD & MF	299	348	348	348	348	348	348	348	348	348	348									2,700
Waiawa Ridge	SFD & MF				500	500	600	600	700	700	800	800	400	400	400	400	400	400	400	0	3,779
Miscellaneous Group I projects				300	100	100	100	102												600	8,000
Subtotal		2,199	2,628	3,128	4,308	4,158	3,848	3,930	3,688	3,218	2,698	2,798	2,060	1,700	1,700	1,700	1,700	1,700	1,571	2,410	51,142
Housing units required (oversupply)																					
Annual		3,401	2,972	2,472	1,292	1,442	1,752	1,670	1,912	2,382	2,902	2,802	3,540	3,900	3,900	3,900	3,900	3,900	4,029		
Cumulative		3,401	6,373	8,845	10,737	11,579	13,331	15,001	16,913	19,295	22,197	24,999	28,539	32,439	36,339	40,239	44,139	48,039	52,068		

ADDENDUM H

EWA GENTRY
Single-Family Sales in Ewa and Central Oahu

Developer	Project	1979	1980	1981	1982	1983	1984	1985	1986	1987
Mililani Town, Inc.	Mililani	276	118	170	198	224	315	474	520	415
Waitec Corporation	Village Park	469	180	34	78	150	149	250	294	290
Finance Realty Co.	Makakilo	0	0	31	8	44	20	39	91	75
Gentry Companies	Waipio Gentry	279	143	35	50	280	431	--	--	--
	Soda Creek									413
Other			96	0	18	54	90	253	162	
		1024	537	270	352	752	1005	1016	1067	1193
Gentry Companies Market share		27.25%	26.63%	12.96%	14.20%	37.23%	42.89%	0.00%	0.00%	34.62%

Source: Bank of Hawaii, Construction in Hawaii.

ADDENDUM I

EWA GENTRY

Multi-Family Sales in Ewa and Central Oahu

Developer	Project	1980	1981	1982	1983	1984	1985	1986	1987
Mililani Town, Inc.	Mililani	--	--	--	--	60	53	133	37
Finance Realty Co.	Makakilo	73	--	--	--	32	22	69	NA
Gentry Companies	Waipio Gentry	134	--	50	200	274	--	--	NA
	Crosspointe	--	--	--	0	88	136	215	NA
Other		393	202	48	129	36	105	122	NA
Total MF Sold (Central & Ewa)		600	202	98	329	490	316	539	37
Gentry Companies market share		22.33%	0.00%	51.02%	60.79%	73.88%	43.04%	39.89%	

Source: Bank of Hawaii, Construction in Hawaii.

ADDENDUM J

EWA GENTRY
Historical and Projected Resident Population for
Oahu and Primary Market Area
1985 - 2005

	1985	1988	1990	1995	2000	2005
Oahu [1]	811,096	841,700	867,100	915,900	945,400	975,100
Primary market area [2]:						
Ewa	36,738	41,539	48,049	65,865	73,371	84,889
Central Oahu	114,611	121,061	124,225	130,344	137,721	142,867
Primary Urban Center	439,841	451,734	461,924	477,404	482,956	490,368
Total	591,190	614,334	634,198	673,613	694,048	718,124
Share of Oahu	72.9%	73.0%	73.1%	73.5%	73.4%	73.6%
Population increases:						
Oahu		25,400	48,800	29,500	29,700	
Primary market area:						
Number		19,865	39,414	20,435	24,077	
Share of Oahu increase		78.2%	80.8%	69.3%	81.1%	

[1] Based on DBED Revised Long-Range Economic and Population Projections, Series M-K.
[2] Series M-K Oahu population projection distributed among the Development Plan Districts based on the old M-F Series distribution.

Source: State of Hawaii, Department of Business and Economic Development (DBED) Series M-K projections, January 1988, and City & County of Honolulu, Department of General Planning (DGP), Residential Development Implications of the Development Plans, August 1985, and DGP 1985 Demographic Data, October 1987.

ADDENDUM K

EWA GENTRY
Average Daily Visitor Census
1985 - 2005

	1985	1988 [2]	1990	1995	2000	2005
State	116,700	147,300	161,700	190,000	217,700	244,900
Oahu	65,300	81,000	87,300	95,000	102,300	110,200
Primary market [1]	62,700	77,800	83,800	91,200	98,200	105,800
Share of State:						
Oahu	56.0%	55.0%	54.0%	50.0%	47.0%	45.0%
Primary market	53.7%	52.8%	51.8%	48.0%	45.1%	43.2%

[1] Estimated as 96% of the Oahu total based on 1988 distribution of visitor accommodations.
[2] Interpolation; 55% of State; 96% of Oahu.

Source: State of Hawaii, DBED, Series M-K projections, January 1988, Hawaii Visitors Bureau, Visitor Plant Inventory, February 1988, and John Child & Company, Inc.

EWA GENTRY
Historical and Projected Daily Golf Demand on Oahu
1985 - 2005

	1985	1988	1990	1995	2000	2005
Resident population	811,096	841,700	867,100	915,900	945,400	975,100
Golf use rate [1]	1.45%	1.45%	1.45%	1.45%	1.45%	1.45%
Daily rounds	11,761	12,205	12,573	13,281	13,708	14,139
Daily visitor census	65,300	81,000	87,300	95,000	102,300	110,200
Golf use rate [1]	1.0%	1.0%	1.0%	1.5%	1.5%	2.0%
Daily rounds	653	810	873	1,425	1,535	2,204
Total daily rounds	12,414	13,015	13,446	14,706	15,243	16,343

[1] Percentage taken from the State Comprehensive Outdoor Recreational Plan Survey, 1985.

Source: John Child & Company, Inc.

EWA GENTRY
Historical and Projected Daily Golf Demand in Primary Market Area
1985 - 2005

	1985	1988	1990	1995	2000	2005
Resident population	591,190	614,334	634,199	673,613	694,047	718,124
Golf use rate [1]	1.45%	1.45%	1.45%	1.45%	1.45%	1.45%
Daily rounds	8,572	8,908	9,196	9,767	10,064	10,413
Daily visitor census	62,700	77,800	83,800	91,200	98,200	105,800
Golf use rate [1]	1.0%	1.0%	1.0%	1.5%	1.5%	2.0%
Daily rounds	627	778	838	1,368	1,473	2,116
Total daily rounds	9,199	9,686	10,034	11,135	11,537	12,529

[1] Percentage taken from the State Comprehensive Outdoor Recreational Plan Survey, 1985.

Source: John Child & Company, Inc.

EWA GENTRY
Historical and Projected Annual Golf Demand
Oahu and Primary Market Area
1985 - 2005

	1985	1988	1990	1995	2000	2005
Daily rounds:						
Oahu	12,414	13,015	13,446	14,706	15,243	16,343
Primary Market Area	9,199	9,686	10,034	11,135	11,537	12,529
Annual rounds (based on 350 days of play):						
Oahu	4,344,900	4,555,250	4,706,100	5,147,100	5,335,050	5,720,050
Primary Market Area	3,219,650	3,390,100	3,511,900	3,897,250	4,037,950	4,385,150

Source: John Child & Company, Inc.

ADDENDUM O

ADDENDUM P

EWA GENTRY
Existing Golf Courses on Oahu

Type	Course name	Location	Size
Military	Ford Island G.C.	Ford Island	9 *
	Fort Shafter G.C.	Fort Shafter	9 *
	Leilehua G.C.	Schofield	18
	NAS Barbers Point G.C.	Ewa	18 *
	Kaneohe Klipper	Kaneohe MCAS	18
	Navy Marine	Aliamanu	18 *
	Hickam G.C.	Hickam AFB	18 *
	Kalakaua G.C.	Schofield	18
	Hickam G.C.	Hickam AFB	9 *
Municipal	Kahuku G.C.	Kahuku	9
	Ted Makalena G.C.	Waipio	18 *
	Pali G.C.	Kaneohe	18
	Ala Wai G.C.	Honolulu	18 *
Daily-fee	Moanalua G.C.	Moanalua	9 *
	Hawaii Kai (Championship)	Hawaii Kai	18
	Hawaii Kai (Executive)	Hawaii Kai	18
	Bay View G.C.	Kaneohe	18
	Hawaii C.C.	Kunia	18 *
	Mililani G.C.	Mililani	18 *
	Olomana Golf Links	Waimanalo	18
	Pearl C.C.	Aiea	18 *
Resort	Turtle Bay C.C.	Kahuku	18
	Makaha G.C. (West)	Makaha	18
	Makaha G.C. (East)	Makaha	18
Private	Oahu C.C.	Nuuanu	18 *
	Waialae C.C.	Kahala	18 *
	Mid-Pacific C.C.	Lanikai	18
	Honolulu International C.C.	Salt Lake	18 *

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* Golf courses within primary market area.

Source: John Child & Company, Inc.

EWA GENTRY
Rounds of Golf Played on Oahu
1986 and 1987

Golf course [1]	Type	No. holes	Rounds Played 1986	Daily	Rounds Played 1987	Daily
Pali G.C.	Municipal	18	144,921	397	141,388	387
Makalena	Municipal	18	155,170	425	165,428	453
Ala Wai	Municipal	18	197,549	541	198,656	544
Kahuku	Municipal	9	38,564	106	43,196	118
Olomana	Daily-fee	18	97,600	267	88,000	241
Hawaii Kai (Championship)	Daily-fee	18	75,000	205	85,000	233
Hawaii Kai (Executive) [2]	Daily-fee	18	73,000	200	73,000	200
Makaha	Resort	18	N.A.	—	50,000	137
Turtle Bay	Resort	18	N.A.	—	58,400	160
Course A	Private	18	66,000	181	72,000	197
Oahu Country Club	Private	18	42,000	115	45,000	123
Waialae Country Club	Private	18	77,000	211	75,000	205
Course B	Military	18	89,500	245	89,600	245
Course C	Military	18	76,900	211	79,400	218
Course D	Military	9	45,200	124	49,600	136
Navy-Marine G.C.	Military	18	90,000 - 100,000	247-274	90,000 - 100,000	247-274
NAS Barbers Pt. G.C.	Military	18	75,000	205	72,000	197
Hickam G.C.	Military	18	85,000	233	85,000	233

[1] For purposes of confidentiality, selected courses are identified only as Course A, B, etc.
[2] Estimate given for 1986 and 1987 at about 200 daily rounds.

Source: John Child & Company, Inc. based on interviews with golf course managers and representatives.

ADDENDUM Q

ADDENDUM R

EWA GENTRY
Annual Rounds Played by Type of Course
Oahu - 1987

Type	Average rounds per course	No. of golf courses	Annual rounds played	Percentage distribution
18-hole golf courses				
Municipal	169,000	3	507,000	23%
Daily-fee	82,000	7	574,000	26
Resort	54,000	3	162,000	7
Private	64,000	4	256,000	12
Military	84,000	6	504,000	23
Subtotal	453,000	23	2,003,000	
9-hole golf courses				
Municipal	41,000	1	41,000	2
Daily-fee [1]	40,000	1	40,000	2
Military	45,000	3	135,000	6
Subtotal	126,000	5	216,000	
Total	579,000	28	2,219,000	100 [2]

[1] Estimated based on Municipal and Military information on 9-hole courses.
[2] Discrepancy because of rounding.

Source: John Child & Company, Inc. based on interviews with golf course managers and representatives.

ADDENDUM S

EWA GENTRY
Annual Rounds Played by Type of Course
Primary Market Area - 1987

Type	Average rounds per course	No. of golf courses	Annual rounds played	Percentage distribution
18-hole golf courses				
Municipal	169,000	2	338,000	25%
Daily-fee	82,000	3	246,000	30
Resort	54,000	0	0	0
Private	64,000	3	192,000	14
Military	84,000	3	252,000	18
Subtotal	453,000	11	1,028,000	
9-hole golf courses				
Municipal	41,000	0	0	0
Daily-fee [1]	40,000	1	40,000	3
Military	45,000	3	135,000	10
Subtotal	126,000	4	175,000	
Total	579,000	15	1,203,000	100 [2]

[1] Estimated based on Municipal and Military information on 9-hole courses.

Source: John Child & Company, Inc. based on interviews with golf course managers and representatives.

ADDENDUM T

EWA GENTRY
Proposed Golf Courses on Oahu

Course name	Location	Type	Size	Est. opening
West Loch	Ewa	Municipal	18	1990 *
Ko Olina	Ewa	Resort	18	1990 *
Royal Hawaiian C.C.	Maunawili	Daily-fee	18	1990
Waikele	Waipahu	Daily-fee	18	1991 *
Meyers Corp.	Ewa	Daily-fee	27	1991 *
Kapolei Village	Ewa	Municipal	18	1991 *
Mokuleia	Mokuleia	Daily-fee	18	1992
Obayashi	Pupukea	Daily-fee	18	1993
Turtle Bay	Kahuku	Resort	18	1993
Kahuku	Kahuku	Municipal	9 [1]	1993
Makakilo	Ewa	Daily-fee	18	1995 *
Waiawa	Waiawa	Not determined	18	1995 *
Village Park	Waipahu	Daily-fee	18	1995 *
Queens Beach	Hawaii Kai	Daily-fee	18	1995
Kipapa	Kipapa	Municipal	18	1995 *
Nihon Kai	Kunia	Private	18	1997 *

* Golf courses within the primary market area.

[1] Increase of additional 9 holes to the existing Kahuku municipal 9-hole course.

Source: John Child & Company, Inc.

EHA GENTRY
Projected Rounds for Proposed Golf Courses
Oahu and Primary Market Area
1990-2000

Type	No. of courses	Average annual rounds	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
Military:														
18-hole course	0	84,000												0
9 -hole course	0	45,000												0
Municipal:														-
18-hole course	3	169,000	169,000 *	169,000 *				169,000 *						507,000
9 -hole course	1	41,000				128,000 [1]								128,000
Daily-fee:														
18-hole course	8	82,000	82,000	82,000 *	82,000	82,000		328,000 [2]						656,000
27-hole course	1	40,000		122,000 *										122,000
Resort:														
18-hole course	2	54,000	54,000 *			54,000								108,000
Private:														
18-hole course	1	64,000								64,000 *				64,000
	16													
Annual rounds:														
Oahu			305,000	373,000	82,000	264,000	0	497,000	0	64,000	0	0	0	1,585,000
Primary Market Area			223,000	373,000	0	0	0	415,000	0	64,000	0	0	0	1,075,000

[1] Kahuku municipal course increased from 9-hole to 18-hole.
[2] Three courses, representing 246,000 rounds, are located within the primary market area.

* Golf courses are located within the primary market area.

Source: John Child & Company, Inc.

ADDENDUM U

EWA GENTRY
Projected Golf Rounds Required on Oahu
(Annual Rounds of Golf)

	1985	1988	1990	1995	2000	2005
Golf rounds demand	4,344,900	4,555,250	4,706,100	5,147,100	5,335,050	5,720,050
Available golf rounds:						
Existing courses	2,219,000	2,219,000	2,219,000	2,219,000	2,219,000	2,219,000
Proposed courses	0	0	305,000	1,521,000	1,585,000	1,585,000
Subtotal	2,219,000	2,219,000	2,524,000	3,740,000	3,804,000	3,804,000
Golf rounds required	2,125,900	2,336,250	2,182,100	1,407,100	1,531,050	1,916,050

Source: John Child & Company, Inc.

EWA GENTRY
Projected Golf Requirement in Primary Market Area
(Annual Rounds of Golf)

	1985	1988	1990	1995	2000	2005
Golf rounds demand	3,219,650	3,390,100	3,511,900	3,897,250	4,037,950	4,385,150
Available golf rounds:						
Existing courses	1,203,000	1,203,000	1,203,000	1,203,000	1,203,000	1,203,000
Proposed courses	0	0	223,000	1,011,000	1,075,000	1,075,000
Subtotal	1,203,000	1,203,000	1,426,000	2,214,000	2,278,000	2,278,000
Golf rounds required	2,016,650	2,187,100	2,085,900	1,683,250	1,759,950	2,107,150

Source: John Child & Company, Inc.

ADDENDUM W

CERTIFICATION

We certify, to the best of our knowledge and belief:

1. Statements of fact in this report are true and correct.

2. Reported analyses, opinions and conclusions are limited only by the reported assumptions and limiting conditions and are our unbiased professional analyses, opinions and conclusions.

3. We have no present or prospective interest in the property which is the subject of this report, and we have no personal interest or bias with respect to the parties involved or the subject matter of this report.

4. Our fees are not contingent upon an action or event resulting from the conclusion in or use of this report.

5. Our analyses, opinions and conclusions were developed and this report conforms with the requirements of the Code of Professional Practice of the American Institute of Real Estate Appraisers (Appraisal Institute), International Society of Real Estate Appraisers (Society) and American Society of Appraisers (ASA), and the use of this report is subject to the requirements of these professional organizations relating to review by its duly authorized representatives.

6. The Appraisal Institute has a voluntary continuing education program. Karen Char, MAI is currently certified under this program.

7. Mr. Ewart made a personal inspection of the property which is the subject of this report.

8. No one other than the undersigned prepared the analysis, opinions and conclusions in this report.

JOHN CHILD & COMPANY, INC.

for

Karen Char, MAI, CRE
Executive Vice President

Uson Y. Ewart, ASA
Appraiser

QUALIFICATIONS OF JOHN CHILD & COMPANY, INC.

John Child & Company, Inc. (John Child) is a professional real estate service corporation which specializes in real estate appraisal and consulting. Founded in 1937, John Child is one of the largest and oldest real estate appraisal and consulting companies in Hawaii. The Company enjoys an established reputation for quality work and professional service. Our reputation is based on our ability to identify and use appropriate and current valuation techniques, our indepth knowledge and analysis of local market conditions and trends, and the extensive training, education and experience of our professional staff.

PROFESSIONAL STAFF

The Company's professional staff has a wide range of real estate experience gained through a range of field experience, professional accomplishments, training and education. As a result, staff members hold designations earned from the major professional organizations.

Our staff members have earned their reputation for quality work and professional service. They qualify as expert witnesses in the courts of Hawaii, California and Massachusetts; instruct and lecture at the University of Hawaii and for various business and professional organizations; serve as review appraisers and arbitrators; and continue to attend courses, seminars and workshops to strengthen their own specialized appraisal skills and education. Our professional staff members include:

- Robert J. Vernon, MAI, CRE, Chairman
- Theodore Wrobel, SREA, ASA, President
- Karen Char, MAI, Executive Vice President
- Craig T. Smith, ASA, Appraiser
- Uson Y. Ewart, ASA, Appraiser
- Paul D. Cool, Appraiser
- Darlene K. Ariola, Real Estate Analyst
- Cheryl Emery, Real Estate Analyst
- May Wong, Real Estate Analyst
- Elizabeth Kimura, Real Estate Analyst

All of our professional staff have attended recent seminars on FHLBB R41c and have been involved in preparing appraisal reports according to the FHLBB standards. The education and professional experiences of our staff members are outlined in their accompanying resumes.

SCOPE OF PROFESSIONAL SERVICES

The Company's real estate appraisal and consulting practice includes:

- Appraisal of real estate
- Highest and best use studies
- Market and financial feasibility analyses
- Economic and fiscal impact assessments
- Arbitration
- Litigation support.

Our studies cover a variety of real estate interests including fee simple, leasehold, leased fee and other partial interest or rights. Our extensive experience includes a variety of properties such as:

- Mixed-use developments
- Office buildings
- Shopping centers and retail facilities
- Hotels and resort facilities
- Industrial properties
- Residential rental apartments
- Residential condominium apartments
- Single-family subdivisions
- Special-purpose properties.

SELECTED CLIENTS

Our clients represent a variety of private and public interests. Selected clients include:

Amfac, Inc.
Amfac Property Development Co.
Ashford & Wriston
Bank of America
Bank of Hawaii
B.P. Bishop Estate/Kamehameha Schools
Estate of James Campbell
Cades, Schutte, Fleming & Wright
Case & Lynch
Castle & Cooke, Inc.
- Mililani Town, Inc.
- Oceanic Properties

Chaminade College
Citibank, N.A.
City & County of Honolulu
- Department of Housing & Community Development

The Equitable Life Assurance Society of the United States of America
Federal Home Loan Bank Board
Finance Realty
First Federal Savings and Loan Association
First Hawaiian Bank
GECC Financial
Goodsill, Anderson, Quinn & Stifel
Hawaiian Electric
Hawaiian Telephone
Honolulu Federal Savings and Loan Association
Kaiser Development Company
Kokusai-Motorcars Co., Ltd.
Loyalty Development, Loyalty Enterprises, Loyalty Finance Co.
Mitsui Trust & Banking Co., Ltd.
Nature Conservancy
Pacific Construction Co., Ltd.
Peat Marwick Main & Co.
Realty Mortgage Investors of the Pacific (RAMPAC)
Security Pacific Mortgage Corp.
Servco Pacific Inc.
Stark Development Company, Ltd.
State of Hawaii
- Department of Land & Natural Resources

Department of Transportation
U.S. Army
U.S. Navy
U.S. Department of the Interior

KAREN CHAR, MAI, CRE, ASA
Executive Vice President

Education

M.B.A., University of Hawaii, 1972.
B.B.A., University of Hawaii, 1970.
Punahou School, 1967.
Various courses sponsored by the American Institute of Real Estate Appraisers.

Professional Associations

Member, American Institute of Real Estate Appraisers (MAI designation).
- Governing Councillor (1986-1988).
- Vice Chairman, National ByLaws Committee (1986-1987).
- Member, National ByLaws Committee (1985); National Admissions Committee (1982-1984).
- Chairman, National Evaluation Report Subcommittee (1982)- Responsible for establishing grading criteria for business reports submitted for demonstration report credit and reviewing failing business reports.
- President (1986), Vice President (1985), Secretary (1984), Honolulu Chapter No. 15.
- Grader, National Board of Examiners (1982-1983) - Responsible for grading business reports and demonstration appraisal reports submitted for credit towards MAI designation.
- Admissions Chairman, Southwest Region (1983).
- Vice Chairman, Thirteenth Pan Pacific Congress of Real Estate Appraisers, Valuers and Counselors (1985-1986).

Member, American Society of Real Estate Counselors (CRE designation).

Senior Member, American Society of Appraisers, (ASA designation, specializing in business valuation).

Member, Panel of Arbitrators of the American Arbitration Association.

Professional Experience

Executive Vice President, John Child & Company, Inc. (1984 to present).
Senior Manager, Peat, Marwick, Mitchell & Co. (1979-1984).
Appraiser, John Child & Company, Inc. (1972-1978).

Court Testimony

Qualified as an expert witness in the valuation of real property and businesses in the Courts of the State of Hawaii.

Certification

The American Institute of Real Estate Appraisers conducts a voluntary program of continuing education for its designated members. MAIs and RMs who meet the minimum standards of this program are awarded periodic educational certification. Karen Char, MAI is certified under this program.

USON Y. EWART, ASA
Appraiser

Education

Bachelor of Architecture, Cornell University, 1972

Punahou School, 1967

Certificate in Advanced Real Estate, University of Hawaii Small Business Management Program.

Courses, workshops, seminars, and examinations including:

- AIREA, Exam 1A-1 Real Estate Appraisal Principles
- AIREA, Exam 1A-2 Basic Valuation Procedures
- AIREA, Standards of Professional Practice
- AIREA, Capitalization Update Seminar
- AIREA, Techniques and Solutions for Contemporary Problems
- AIREA, Capitalization Theory and Techniques, Parts A and B
- AIREA, Case Studies in Real Estate Valuation
- AIREA, Review of R41c and the Recordkeeping Requirements of the FHLBB, 1987
- SREA, Investment Analysis Workshop
- SREA, Application of Market Extractions
- SREA, Construction Costs Estimating Workshop

Professional Associations

Senior Member, American Society of Appraisers in the Real Property Discipline (ASA designation).
- President, Honolulu Chapter No. 16
- Past Vice President and Secretary, Honolulu Chapter No. 16

Candidate, American Institute of Real Estate Appraisers (candidate for MAI designation).

Professional Experience

Appraiser, John Child & Company, Inc. (1977 to present).

Court Testimony

Qualified as an expert witness in the valuation of real property in the Courts of the State of Hawaii and the United States District Courts in Massachusetts and California.

EXHIBIT D

EXHIBIT D

RELATIONSHIP TO STATE AND CITY PLANS

RELATIONSHIP TO STATE AND CITY PLANS

A. THE HAWAII STATE PLAN

Ewa Gentry will meet several objectives of The Hawaii State Plan (Hawaii Revised Statutes. Chapter 226. amended), including:

"Section 226-5 Objective 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) To achieve the population objective, it shall be the policy of this State to:

(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.

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

Ewa Gentry's 5,300 dwelling units will provide new housing opportunities for approximately 14,000 residents on Oahu and is consistent with the development of Kapolei as a secondary urban center.

"Section 226-6 Objectives and policies for the economy - in general.

(a) Planning for the state's economy in general shall be directed toward achievement of the following objectives:

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

(b) To achieve the general economic objectives, it shall be the policy of this State to:

. . .

(8) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.

(9) Foster greater cooperation and coordination between the public and private sectors in developing Hawaii's employment and economic growth opportunities."

"Section 226-7 Objective and policies for the economy - agriculture.

(a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:

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

(2) Continued growth and development of diversified agriculture throughout the state."

The development of Ewa Gentry will create diversified job opportunities and generate a demand for new retail trade and commercial services within the Ewa district. Moreover, the proposed reduction of lands currently in sugarcane production is not expected to threaten the economic viability of Oahu Sugar Company, nor is it doubtful that urbanization of these lands would adversely affect continued growth of diversified agriculture on a statewide basis.

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

(a) Planning for the State's socio-cultural advancement with regard to housing shall be directed towards achievement of the following objectives:

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

(2) The orderly development of residential areas sensitive to community needs and other land uses.

(b) To achieve the housing objectives, it shall be the policy of this State to:

(1) Effectively accommodate the housing needs of Hawaii's people.

(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group housing.

(3) Increase home ownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing."

Ewa Gentry will provide 5300 new housing units for Oahu residents. It will offer a variety of housing types at prices that will be highly competitive with other private projects planned in Ewa and Central Oahu.

B. STATE HOUSING FUNCTIONAL PLAN

This plan provides for the identification of lands suitable for housing development, including water availability, proximity to existing and planned urban development, use of existing urban lands, avoidance of critical environmental areas, and consideration of the cost of building infrastructure and providing open space.

The entire Ewa Gentry development area has been designated for urban use by the State Land Use Commission. Moreover, the project meets all signficant development criteria under the State's Housing Functional Plan.

C. CITY & COUNTY OF HONOLULU GENERAL PLAN

Continued development of Ewa Gentry will promote the following General Plan Objectives and Policies:

"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 developmental pressures in the remaining urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center.

Policy 4: Seek a year 2010 distribution of Oahu's residential population which would be in accord with the following table:

Location	% of Year 2010 Islandwide Population
Primary Urban Center	45.1 - 49.8%
Ewa	12.0 - 13.3%
Central Oahu	14.9 - 16.5%
East Honolulu	5.3 - 5.8%
Koolaupoko	11.0 - 12.2%
Koolauloa	1.3 - 1.4%
North Shore	1.6 - 1.8%
Waianae	3.8 - 4.2%
	95.0 - 105.0%"

Ewa Gentry will enhance development of the secondary urban center at Kapolei. The project is consistent with the desired residential population distribution for the Ewa area and will be built at densities comparable to other urban fringe communities such as Waipio Gentry.

"Housing Objective A

To provide decent housing for all the people of Oahu at. prices they can afford."

"Housing Objective C

To provide the people of Oahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.

Policy 1: Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.

Policy 2: Encourage the fair distribution of low- and moderate-income housing throughout the island.

Policy 3: Encourage residential development near employment centers."

Ewa Gentry will provide 5,300 new housing units in close proximity to the secondary urban center and other existing and proposed employment centers in Ewa, Waipahu, Waipio, Pearl City and Wahiawa. The project will produce a variety of housing types for a broad range of income groups and household sizes, at prices that will be highly competitive with other private projects planned in Ewa and Central Oahu. A sizeable percentage of the units will be affordable to low-mod, moderate and gap group income households.

EXHIBIT E

EXHIBIT E

SOCIO-ECONOMIC CONDITIONS

SOCIO-ECONOMIC CONDITIONS

A. HOUSING

Existing Conditions

The Ewa district is comprised of five primary residential areas: Iroquois Point, Ewa Beach, Barbers Point, Makakilo and the Ewa Villages. According to Department of General Planning estimates, the combined housing stock is approximately 9,500 homes.

Project Impact

Development of Ewa Gentry will contribute 5,300 units to Oahu's housing inventory. It is anticipated that a sizeable percentage will be affordable to low-mod, moderate and gap group income households.

B. POPULATION

Existing Conditions

DGP's 1985 population estimates for the Ewa district indicate a regional population of approximately 37,000 residents, about 4.5% of Oahu's total population. About one-third of the current Ewa population live in the Iroquois Point area where many Pearl Harbor-based families reside. Another 55% live in Makakilo and Ewa Beach and the remainder live in the Ewa Villages or Barbers Point area.

Project Impact

The 5,300 housing units authorized for Ewa Gentry are expected to generate a population of approximately 14,000 residents, based on an average of 3.25 persons per single-family unit and 2.1 persons per multi-family unit.

C. EMPLOYMENT

Existing Conditions

In recent years, the Ewa district has been considered a plantation community, as well as a suburban bedroom community whose residents commute to Honolulu, Barbers Point NAS and Pearl Harbor for work.

The Department of General Planning estimates that approximately 10,550 persons were employed in the Ewa district in 1985.

Project Impact

The development of Ewa as Oahu's secondary urban center will significantly alter employment patterns in the district. DGP estimates that several proposed developments will generate approximately 24,400 new jobs through the Year 2005. While the status of some of these developments is still pending, the anticipated resort, commercial and residential growth in Ewa is expected to provide a greater number and diversity of job opportunities and increased income within the region.

Ewa Gentry alone is expected to generate an average of 500 jobs in direct construction employment throughout the projected construction period. These jobs will in turn create indirect employment in other construction-related activities such as building suppliers.

Upon completion of the project, well over 1,000 onsite jobs will become available. This figure is based upon 50 jobs at the golf course/clubhouse/restaurant, one job per 75 homes to provide maintenance and security services, 75 jobs at the elementary school, plus 30 jobs per acre of commercial space and 20 jobs per acre of industrial space which are planned for development in future phases of the project.

The proposed expansion of Campbell Industrial Park, construction and operation of Barbers Point Deep Draft Harbor and development of Ko Olina and Kapolei Town Center will also contribute many new jobs.

TABLE 5

ANTICIPATED EMPLOYMENT GENERATION OF DEVELOPMENT PROPOSALS IN EWA
1988 - 2005

Proposed Development Project	Anticipated New Jobs
Campbell Industrial Park	4,000
Barbers Point Harbor	2,000
Ko Olina	5,100
Kapolei Town Center	12,500
Ewa Marina	800
TOTAL	24,400

Source: Department of General Planning, City & County of Honolulu, 1988.

D. AGRICULTURAL RESOURCES

Existing Conditions

The amendment area includes approximately 300 acres of land presently in sugarcane cultivation by Oahu Sugar Company. These lands have been used for this purpose since the late 1800's when Ewa Plantation Company began cultivation and processing of cane in Ewa. The existing Oahu Sugar Company lease from the Estate of James Campbell expires in 1995.

There is also a 41 acre plant nursery operated by Living Designs Inc. The leases on this property expire in 1994 and 1995.

Project Impact

Applicant's consultant, Decision Analysts Hawaii, Inc. has evaluated the impact of proposed development on the community's agricultural resources. The report, entitled "Proposed Ewa Gentry Community: Impact on Agriculture", is included as Appendix I in the EIS.

The consultant concludes that Ewa Gentry, in combination with other approved and proposed projects, is not expected to threaten the economic viability of Oahu Sugar Company. Economies of scale and a compact, efficient plantation would be possible by (1) switching to a single mill operation, or (2) retaining a two mill operation provided that urbanization proceeds gradually and crop yields can be increased rapidly to compensate for the loss of acreage.

While development of the project area would eliminate the possibility of its use for diversified agriculture, it is doubtful that this loss would adversely affect the continued growth of diversified agriculture on a statewide basis. Decision Analysts Hawaii indicates that economic forces have resulted in an increasing availability of prime agricultural lands, particularly on the neighbor islands, which could be used for diversified agriculture. Prior sugar mill closings and reductions in operations have freed extensive amounts of prime agricultural lands from sugar and pineapple production.

Campbell Estate, in its lease to Oahu Sugar Company, has reserved the right to effectuate an orderly, incremental withdrawal from cultivation of certain lands planned for development. Any phaseout plan would intend to minimize the impact on sugar production operations.

EXHIBIT F

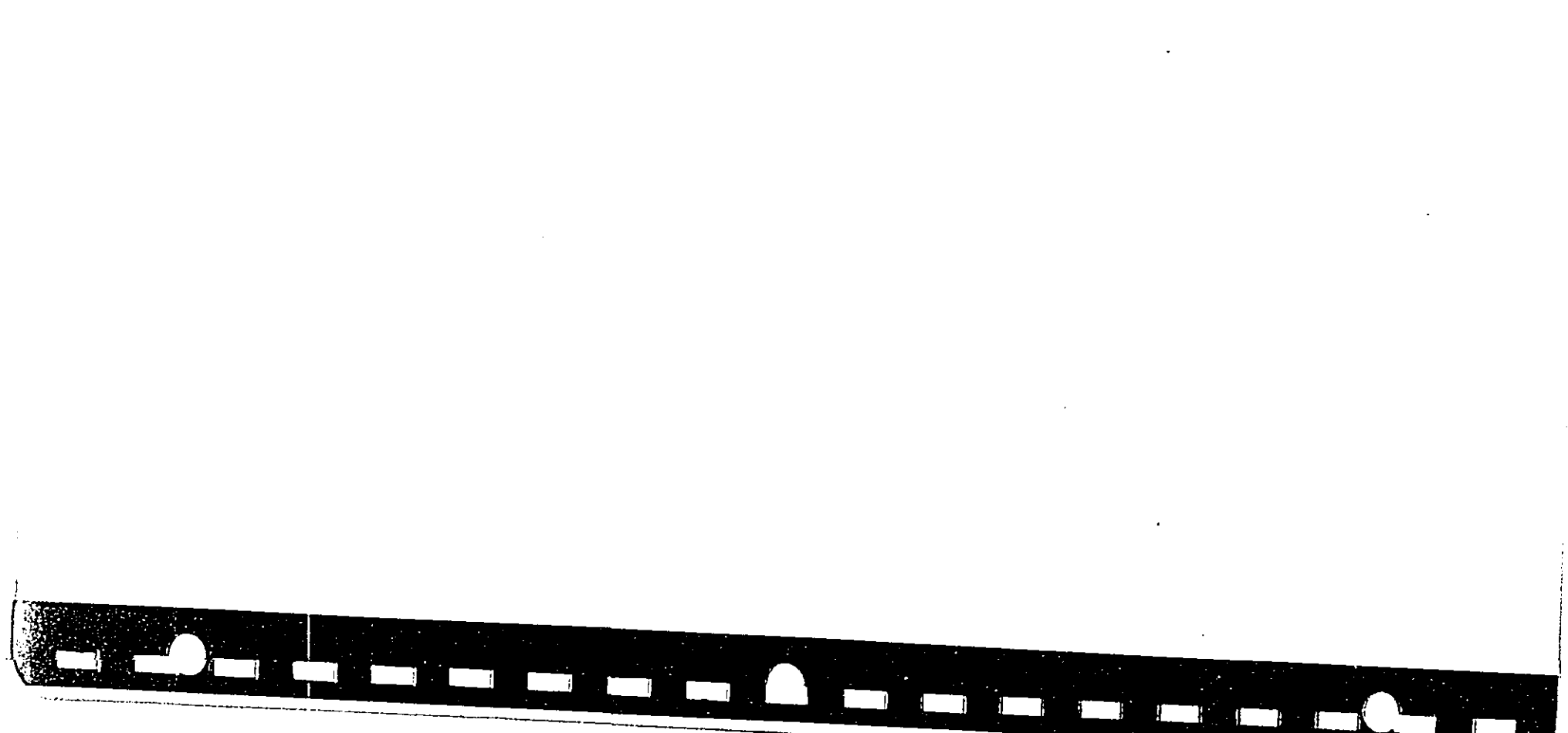

EXHIBIT F

PUBLIC SERVICES AND INFRASTRUCTURE

PUBLIC SERVICES AND INFRASTRUCTURE

A. FIRE PROTECTION

The City & County of Honolulu provides fire protection services for the Ewa area from the Ewa Beach Station with backup protection provided by the Waipahu Station. Two new stations, the Ewa Tenney Village Station and the Campbell Industrial Park Station are scheduled for construction in 1992, pending approval and funding availability. Existing and proposed fire protection services will be adequate to handle the fire protection needs of the project.

B. HEALTH CARE FACILITIES

Health care services in the area are provided by the Waipahu Clinic and the Moanalua Kaiser Medical Center. The Waipahu Clinic provides a variety of outpatient services while the nearest hospital/emergency services are available at the Moanalua facility.

St. Francis Hospital is currently constructing the first phase of a new medical facility about a mile north of Ewa Gentry. Completion of the first phase which will include a medical office building and a 100 bed hospital facility is expected in late 1990.

The existing and proposed health care facilities are expected to be adequate to meet the health care needs of project residents.

C. POLICE PROTECTION

The Pearl City Station provides police protection for the Ewa district. In compliance with Honolulu Police Department standards, one police officer is assigned to the district for every 412 residents. An increase in the police force will be necessary to provide adequate protection for the residents of this project.

D. REFUSE COLLECTION

Refuse disposal services for the residential portions of the project will be provided by the City & County of Honolulu. Private refuse companies will be utilized for non-residential developments such as the golf course.

Solid waste is currently transported to the Kalaheo Landfill in Kailua or to the Waipahu Incinerator. The Waimanalo Gulch Landfill is under construction and is also expected to be available for use.

E. SCHOOLS

The State Department of Education (DOE) currently operates six public schools in the vicinity of the project. In order to accommodate the projected population growth in the Ewa district, the DOE is considering development of additional schools at Kapolei Village, West Loch and Ewa Gentry.

The applicant has set aside a 6 acre school site adjacent to a 12 acre park site for development of a public elementary school. Until the school is built, residents of the project will attend Ewa Beach Elementary School which had a surplus of classrooms during the 1988-89 school year. DOE officials indicate that the intermediate and high school classroom needs of project residents can be met by existing and proposed schools within the district.

F. TRANSPORTATION

Existing Conditions

Fort Weaver Road serves as the main north-south collector/arterial roadway for the Ewa Beach area and is the primary access to Ewa Gentry. From the H-1 Freeway to Hanakahi Street, it is a four-lane divided highway with two twelve-foot wide lanes, a ten-foot wide outside shoulder and a four-foot wide median shoulder provided in each direction. The segment south of Hanakahi Street has one traffic lane in each direction.

The intersection of Renton Road/Arizona Road and Fort Weaver Road is a signalized cross-intersection with Renton Road as the west leg and Arizona Road as the east leg of this intersection. The northbound approach on Fort Weaver Road contains a left turn only lane, a through lane and a shared lane for through and right turn movements. The southbound approach is striped for a left turn only lane, two through lanes and a deceleration lane for right turns onto Renton Road.

The Renton Road approach consists of a left turn only lane and a shared lane for left turn, through and right turn traffic with a short acceleration/merge lane for right turns onto Fort Weaver Road. The Arizona Road approach contains a single shared lane for all movements. Arizona Road is paved for a short segment that leads to a gate controlling access to a private cane haul road.

The intersection of Geiger Road/Iroquois Road and Fort Weaver Road is another signalized cross-intersection with Geiger Road as the west leg and Iroquois Road as the east leg of the intersection. Each approach on Fort Weaver Road contains a left turn only lane, two through lanes and a separate right turn/deceleration lane. The Geiger Road and Iroquois Road approaches each have a shared lane for left turns and through movements and a short acceleration lane for right turns onto Fort Weaver Road.

Parsons Brinckerhoff Quade and Douglas, Inc. (PBQD) conducted a traffic count and impact analysis in April 1987 for the Ewa Gentry project. Their draft report is included as Appendix H in the EIS and the final report, dated August 1988, is included in this application as Appendix A.

According to the PBQD study, the Renton Road/Fort Weaver Road and Geiger Road/Fort Weaver Road intersections are operating at under-capacity conditions (LOS B) during the AM and PM peak hours. An analysis of the Fort Weaver Road segment north of Renton Road also indicates LOS B conditions for the northbound and southbound lanes during both peak hours. However, there is congestion at the intersection of Kunia Road and the eastbound on-ramp at Kunia Interchange during the morning peak hour. Vehicles entering the ramp from the south must merge with traffic from Waipahu and then yield to vehicles entering from the north.

Project Impact

PBQD's impact analysis assumed full development of Ewa Gentry, partial development of Ewa Marina (1,300 units), and 100% occupancy of the Ewa Expandable and Ewa Elderly housing units. Their evaluation of the number of trips generated by the project is summarized in Table 6.

Ewa Gentry is expected to have an impact on the immediate area of Fort Weaver Road and on a regional basis which would include Kunia Interchange and the H-1 Freeway. However, adequate service to/from the H-1 Freeway could be accomplished with lane improvements on Fort Weaver Road and implementation of a ride-sharing program. Under these conditions, the intersections on Fort Weaver Road and within the project site could all have adequate capacities to serve the projected future traffic demands.

The applicant will participate in the funding and construction of transportation improvements at access points to the project, and will also participate with

TABLE 6

TRAFFIC GENERATION
EWA GENTRY

Land Use	Daily (vpd) Enter & Exit	AM Peak Hour (vph) Enter	AM Peak Hour (vph) Exit	PM Peak Hour (vph) Enter	PM Peak Hour (vph) Exit
4,050 Single-Family Units	40,751	824	2,229	2,564	1,506
3,500 Multi-Family Units	21,361	335	1,527	1,602	754
Elementary School 1,000 Students	1,032	138	92	2	14
Park 26 acres	754	32	32	44	44
Golf Course 180 acres	1,498	38	10	6	64
Commercial 87.12 TSF	6,794	113	48	284	296
Industrial 30 acres	1,554	193	39	49	174
TOTAL TRIP ENDS	73,744	1,673	3,977	4,551	2,852

Notes: vpd = vehicles per day
vph = vehicles per hour
TSF = thousand square feet

Source: Parsons Brinckerhoff Quade & Douglas, August 1988.

all adjoining landowners and developers on a fair share basis in funding the construction of other on and off site transportation improvements necessitated by development of the property, in proportion to its share of the increased traffic in the region. A regional highway transportation master plan is currently being developed to identify needed roadway improvements, determine cost estimates and identify methods of cost sharing.

The applicant will also participate in a regional transportation management program to encourage ridesharing and greater use of public transportation. A park and ride facility will be sited in the project area.

G. WATER

Existing Conditions

The project is located within the Ewa-Waianae District of the Board of Water Supply system. However, since most of the site is under sugarcane cultivation, Oahu Sugar Company's agricultural water system currently supplies all water for its operations. Board of Water Supply's existing system consists of a 30-inch main running along Farrington Highway between Waipahu and the Barbers Point 215-foot storage system and a 16-inch transmission main located in Fort Weaver Road.

Gentry is a member of the Ewa Plain Water Development Corp which was organized to develop municipal water resources and transmission systems to accommodate proposed Ewa developments. In 1985, the State of Hawaii issued $25 million in special purpose revenue bonds to finance the Corporation's well and water infrastructure construction costs. Gentry has made a commitment of $10 million to develop its share of the necessary wells, storage and transmission facilities to serve the entire Ewa Gentry project.

The Corporation has prepared an Ewa Water Master Plan which was approved by the Board of Water Supply in October 1987. The plan identifies offsite sources, transmission and storage systems necessary to supply potable water to the proposed Ewa developments. Major facilities serving Ewa Gentry include a second 30-inch main within Farrington Highway, a 42-inch main from Farrington Highway to the project area, and transmission and storage facilities above H-1 Freeway. These facilities have been constructed by the Corporation and are now operational.

TABLE 7

PROJECTED WATER REQUIREMENTS
FOR THE EWA GENTRY PROJECT

(based on Land Use Plan dated May 18, 1988)

YEAR	SF (Units)	MF (Units)	GOLF/ PARK (Acres)	SCHOOL (Acs/Stud)	COMMER- CIAL (Acres)	INDUS- TRIAL (Acres)	USE (MGD) POTABLE	USE (MGD) NON-POTABLE	DEMAND (MGD) POTABLE	DEMAND (MGD) NON-POTABLE
1988	410	300					0.2878	0.0372	0.3043	0.0447
1989	340	440	68			10	0.3441	0.3139	0.3788	0.3768
1990	600	260	60				0.4078	0.2362	0.4293	0.2835
Subtotal to 1990	1350	1000	128			10	1.0397	0.5873	1.1124	0.7050
1991	760	270	60				0.4905	0.2375	0.5126	0.2850
1992	480	500	6		8	20	0.4197	0.1483	0.4555	0.1781
1993	600	310					0.3856	0.0384	0.4026	0.0462
1994	530	360					0.3644	0.0446	0.3842	0.0536
1995	170	600	12	7/ 900			0.2893	0.1377	0.3300	0.1654
Subtotal to 1991-95	2540	2040	78	7/ 900	8	20	1.9495	0.6065	2.0849	0.7283
1996	160	460					0.2070	0.0570	0.2323	0.0685
TOTAL	4050	3500	206	7/ 900	8	30	3.1962	1.2508	3.4296	1.5018

Project Impact

At full development, the project is expected to generate an average daily water demand of 3.4 million gallons per day (mgd) of potable water and 1.5 mgd of non-potable water. Non-potable water will be used to irrigate the golf course, greenways, multi-family landscaped areas and the entry water feature.

For its potable water system, Gentry will install an on site water distribution system consisting of water mains and fire hydrants within the road and street rights-of-way. Distribution lines, mains and fire hydrants will be constructed to meet Board of Water Supply standards and will be dedicated to the Board for continuous maintenance.

H. WASTEWATER DISPOSAL

Existing Conditions

The Honouliiuli Wastewater Treatment Plant is located west of Ewa Gentry near Geiger Road. There is an existing 84-inch sewer main in the vicinity of the project located within Geiger and Iroquois Point Roads.

The existing capacity of the Honouliiuli Plant will be able to accommodate wastewater flows from an additional 3,550 residential hookups in Ewa Gentry. The Department of Public Works is planning to expand the Plant's capacity by 13 million gallons per day to 38 mgd in 1993. The additional capacity will be needed to accommodate all of the planned developments in Ewa and Central Oahu.

Project Impact

At full development, the project is expected to generate 2.8 million gallons of wastewater per day. Gentry will construct an on site sewage collection system which will be interconnected with the existing 84-inch interceptors along Geiger Road. The on site system will be designed to Department of Public Works standards and dedicated to the City for perpetual maintenance.

APPENDIX A

Appendix A
Traffic Impact Study

TRAFFIC IMPACT STUDY

EWA GENTRY

EWA, OAHU, HAWAII

Gentry Development Company

August 1988

Parsons Brinckerhoff

TRAFFIC IMPACT STUDY

EWA GENTRY
Ewa, Oahu, Hawaii

Prepared for:

Gentry Development Company

Prepared by:

Parsons Brinckerhoff Quade and Douglas, Inc.

Honolulu, Hawaii

August 1988

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TRAFFIC IMPACT STUDY
EWA GENTRY

August 16, 1988

INTRODUCTION

Gentry Development Company has proposed to develop a residential community in Ewa on the island of Oahu. The master plan of the 1,016-acre site includes approximately 4,050 single-family and 3,500 multi-family residential units, and provides an elementary school site, three parks, an eighteen-hole golf course, an 8-acre shopping center, and 30 acres for industrial use. This study evaluates the traffic impacts of the proposed project at full development of the project. Traffic generated by other major developments in the Ewa area have also been considered in the evaluation of the expected traffic impacts.

EXISTING CONDITIONS

The project is located near the Ewa Beach community on the island of Oahu. The project site is south of the old Oahu Railway and Land Company right-of-way and extends beyond Geiger Road (Figure 1). Fort Weaver Road runs through the approximate center of the project site, which is presently used to grow sugar cane and has limited public vehicular access.

Roadway System

Fort Weaver Road links the town of Ewa Beach to the H-1 Freeway and Waipahu. Fort Weaver Road changes to Kunia Road north of Farrington Highway and serves as the main north-south collector/arterial roadway for the Ewa Beach area. The portion of Fort Weaver Road between

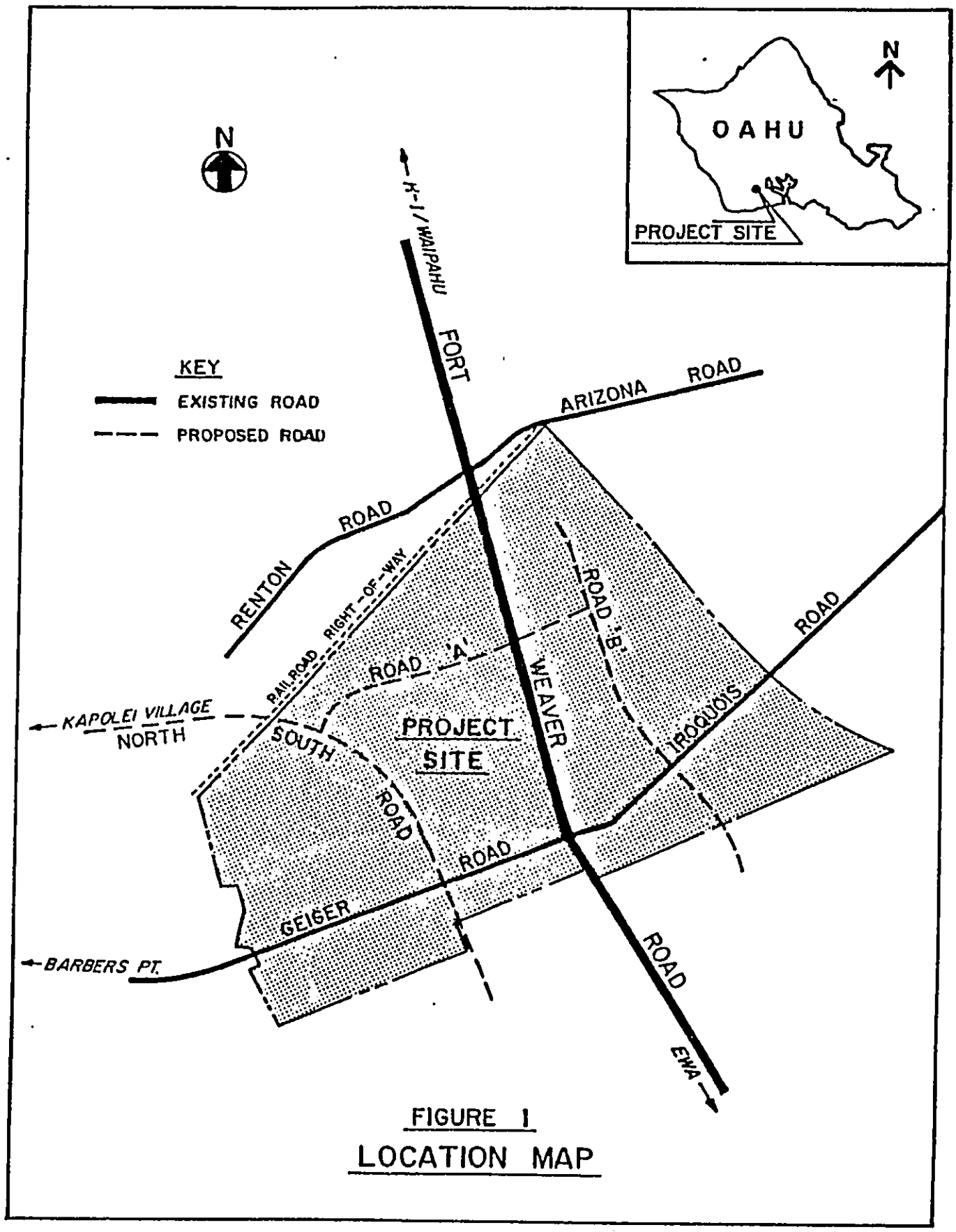

FIGURE 1

LOCATION MAP

Farrington Highway and Renton Road is a divided four-lane highway with two twelve-foot wide lanes, a ten-foot wide outside shoulder, and a four-foot wide median shoulder provided in each direction. The segment of Fort Weaver Road, between Renton Road and Hanakahi Street, located south of Geiger Road, has recently been widened to a similar cross-section. Fort Weaver Road has one traffic lane in each direction south of Hanakahi Street.

The intersection of Renton Road/Arizona Road and Fort Weaver Road is a signalized cross-intersection with Renton Road forming the west leg and Arizona Road being the east leg of this intersection. The northbound approach on Fort Weaver Road contains a left turn only lane, a through lane, and a shared lane for through and right turn movements. Fort Weaver Road's southbound approach is striped for a left turn only lane, two through lanes and a deceleration lane for right turns onto Renton Road. The Renton Road approach consists of a left turn only lane and a shared lane for left turn, through, and right turn traffic with a short acceleration/merge lane for right turns onto Fort Weaver Road. The Arizona Road approach contains a single shared lane for all movements. Arizona Road is paved for a short segment which leads to a gate controlling access to a private cane haul road.

The intersection of Geiger Road/Iroquois Road and Fort Weaver Road is another signalized cross-intersection with Geiger Road as the west leg and Iroquois Road as the east leg of the intersection. Each approach on Fort Weaver Road contains a left turn only lane, two through lanes, and a separate right turn/deceleration lane. The Geiger Road and Iroquois Road approaches each have a shared lane for left turns and through movements and a short acceleration lane for right turns onto Fort Weaver Road.

Existing Traffic Conditions

The description of existing traffic conditions is based on manual counts and observations taken on a weekday in late April 1987 for the Renton Road/Fort Weaver Road and Geiger Road/Fort Weaver Road inter-

sections during the morning (AM) and afternoon (PM) peak periods. The AM and PM peak hours are based on total hourly volumes. Figure 2 shows the existing peak hour volumes.

The analyses of signalized and unsignalized intersections were conducted using methodologies in the 1985 Highway Capacity Manual[1] (HCM). Analysis of the existing traffic volumes at the Renton Road/ Fort Weaver Road intersection using the HCM operational analysis for signalized intersections shows Level of Service (LOS) B conditions during the AM and PM peak hours. Levels of Service are described in the appendix.

Field observations at the Renton Road/Fort Weaver Road intersection noted that the southbound left turn storage lane on Fort Weaver Road was used almost exclusively by drivers executing U-turns to travel north during the protected left turn phase. The traffic observed on Arizona Road used this approach primarily as a "Kiss-and-Ride" facility due to its proximity to a northbound bus stop on Fort Weaver Road; drivers dropped off passengers at the bus stop, then waited until the bus picked up the passengers before leaving.

Analysis of the counted traffic volumes at the signalized Geiger Road/Fort Weaver Road intersection shows that this intersection operates at LOS B during the AM and PM peak hours.

The four-lane Fort Weaver Road was analyzed using the HCM analysis, which measures the performance of multilane highways in terms of time delay, speed, and capacity utilization. The analysis of the segment north of Renton Road shows LOS B conditions for the northbound and southbound lanes during both peak hours.

An evaluation of existing conditions at the intersection of Kunia Road and the eastbound on-ramp at Kunia Interchange during the period from 5:45 AM to 7:15 AM, indicates congested conditions for vehicles entering the ramp from the south since they must yield to vehicles entering the ramp from the north.

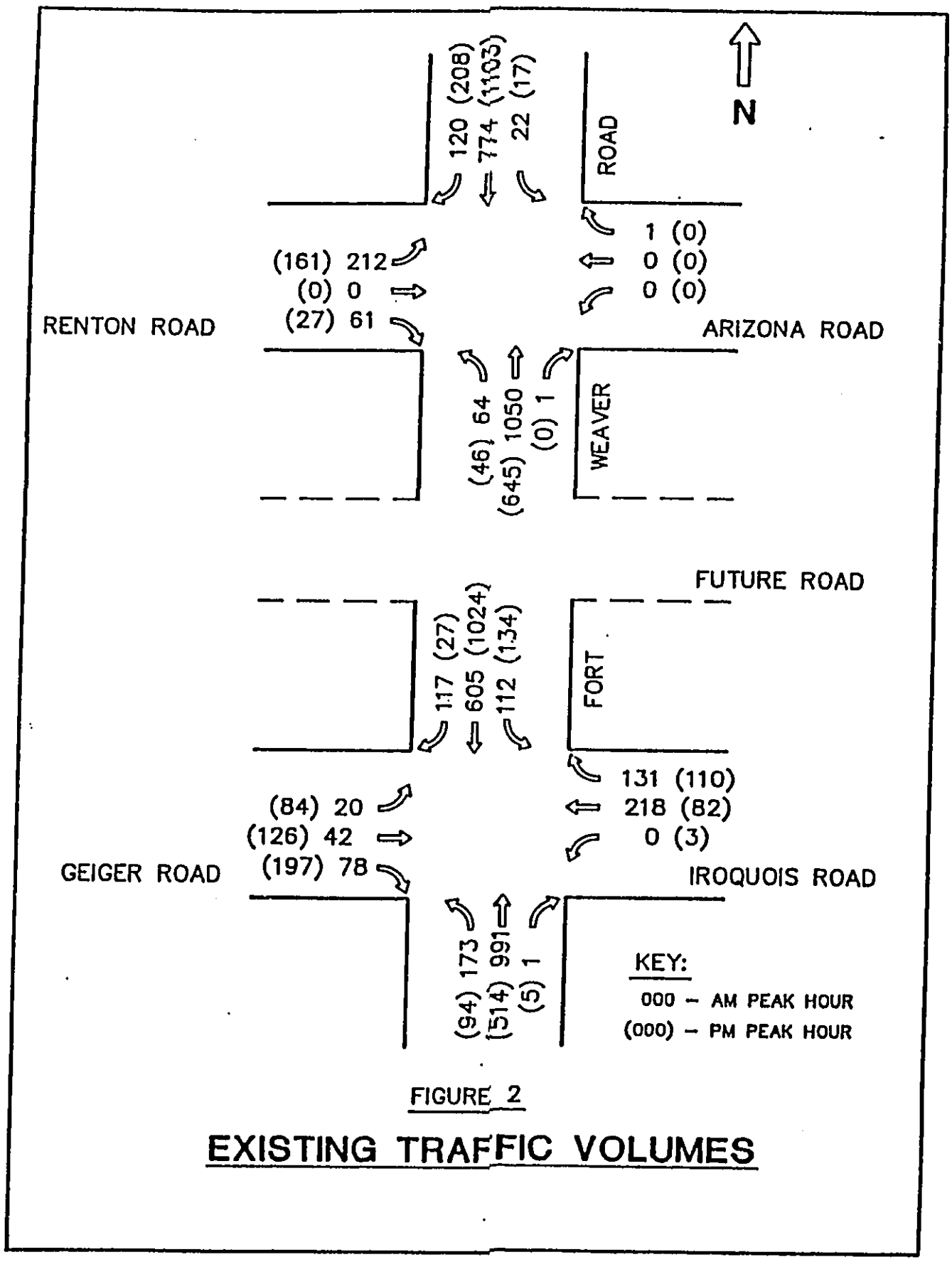

FIGURE 2

EXISTING TRAFFIC VOLUMES

TRAFFIC GENERATION

Traffic generation consists of estimating the number trips produced and attracted by the project, determining the origins and destinations of the trips, and assigning project traffic to the roadway network.

Trip Generation

The trip generation estimates the number of trips produced and attracted by the project. Trip rates from the Institute of Transportation Engineers' informational report, Trip Generation[2], Fourth Edition was used. The shopping center was estimated to have a gross area of 87,000 square feet, based on a floor area ratio of (building to land) of 0.25. The elementary school's student body was estimated to be approximately 1,000 students.

The analysis accounted for a number of internal trips within the project during the AM and PM peak hours. The internal trips include trips between residential areas and the school, the golf course, shopping center, or industrial area. Table 1 shows the trip generation rates while Table 2 shows the trip generation for the project.

Trip Distribution

Trip distribution determines the origins and destinations of the traffic generated by the project. The distribution was based on completion of the proposed Kapolei Village and Kapolei Town Center, located west of the proposed project, and the North-South Road which would provide a direct connection from the proposed project to Kapolei Village and Kapolei Town Center. The trips were distributed in four directions: south to Ewa Beach, east to Honolulu or Waipahu, northwest to Kapolei Village and Waianae, and west to Barbers Point Naval Air Station. The trip distribution factors were estimated from the number of existing dwelling units and jobs in the four areas mentioned above and are shown in Table 3.

Table 1

TRIP GENERATION RATES

Land Use (Parameter)	Daily (vpd) Total	AM Peak Hour (vph) Total	AM Peak Hour (vph) % Entering	PM Peak Hour (vph) Total	PM Peak Hour (vph) % Entering
Single-Family (dwelling unit)	10.062	0.754	27	1.005	63
Multi-Family (dwelling unit)	6.103	0.532	18	0.673	68
Elementary School (students)	1.032	0.230	60	0.015	10
Park (acres)	29.000	2.431	50	3.370	50
Golf Course (acres)	8.325	0.266	80	0.386	8
Commercial (1,000 square feet)	77.984	1.848	70	6.657	49
Industrial (acres)	51.803	7.732	83	7.426	22

Notes: vpd = vehicles per day
vph = vehicles per hour

Table 2

TRIP GENERATION

Land Use	Daily (vpd) Enter & Exit	AM Peak Hour (vph) Enter	AM Peak Hour (vph) Exit	PM Peak Hour (vph) Enter	PM Peak Hour (vph) Exit
4,050 Single-Family Units	40,751	824	2,229	2,564	1,506
3,500 Multi-Family Units	21,361	335	1,527	1,602	754
Elementary School 1,000 Students	1,032	138	92	2	14
Park 26 acres	754	32	32	44	44
Golf Course 180 acres	1,498	38	10	6	64
Commerical 87.12 TSF	6,794	113	48	284	296
Industrial 30 acres	1,554	193	39	49	174
TOTAL TRIP ENDS	73,744	1,673	3,977	4,551	2,852

Notes: vpd = vehicles per day
vph = vehicles per hour
TSF = thousand square feet

Table 3

TRIP DISTRIBUTION FACTORS

Direction	AM Peak Hour		PM Peak Hour	
	Enter	Exit	Enter	Exit
South	5%	5%	7%	7%
East	77%	77%	66%	66%
Northwest	15%	15%	23%	23%
West	3%	3%	4%	4%
	100%	100%	100%	100%

Traffic Assignment

Traffic assignment designates the roadways that the project traffic can be expected to utilize. Completion of the North-South Road was assumed which would provide a direct link to Kapolei Village and Kapolei Town Center. The North-South Road would pass through the west half of the project site. Traffic entering and exiting the project to/from the east were assigned to Fort Weaver Road. Traffic to/from the south (Ewa Beach) was also assigned to Fort Weaver Road while trips to/from the west (Barbers Point) were assigned to Geiger Road. The internal trips are assigned to the various collector roadways within the project. Figures 3a, 3b, and 3c display the estimated future traffic volumes with the project.

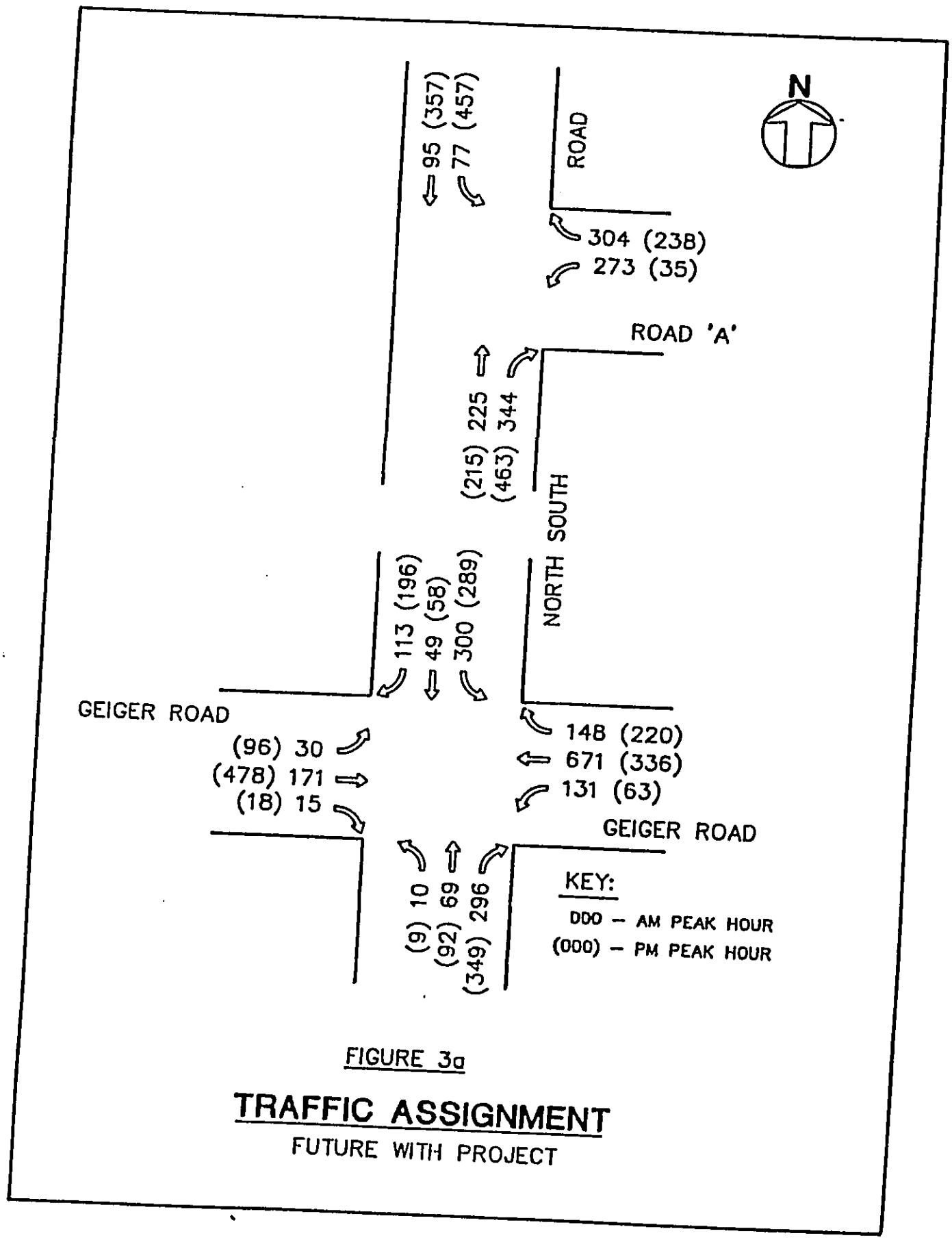

FIGURE 3a

TRAFFIC ASSIGNMENT

FUTURE WITH PROJECT

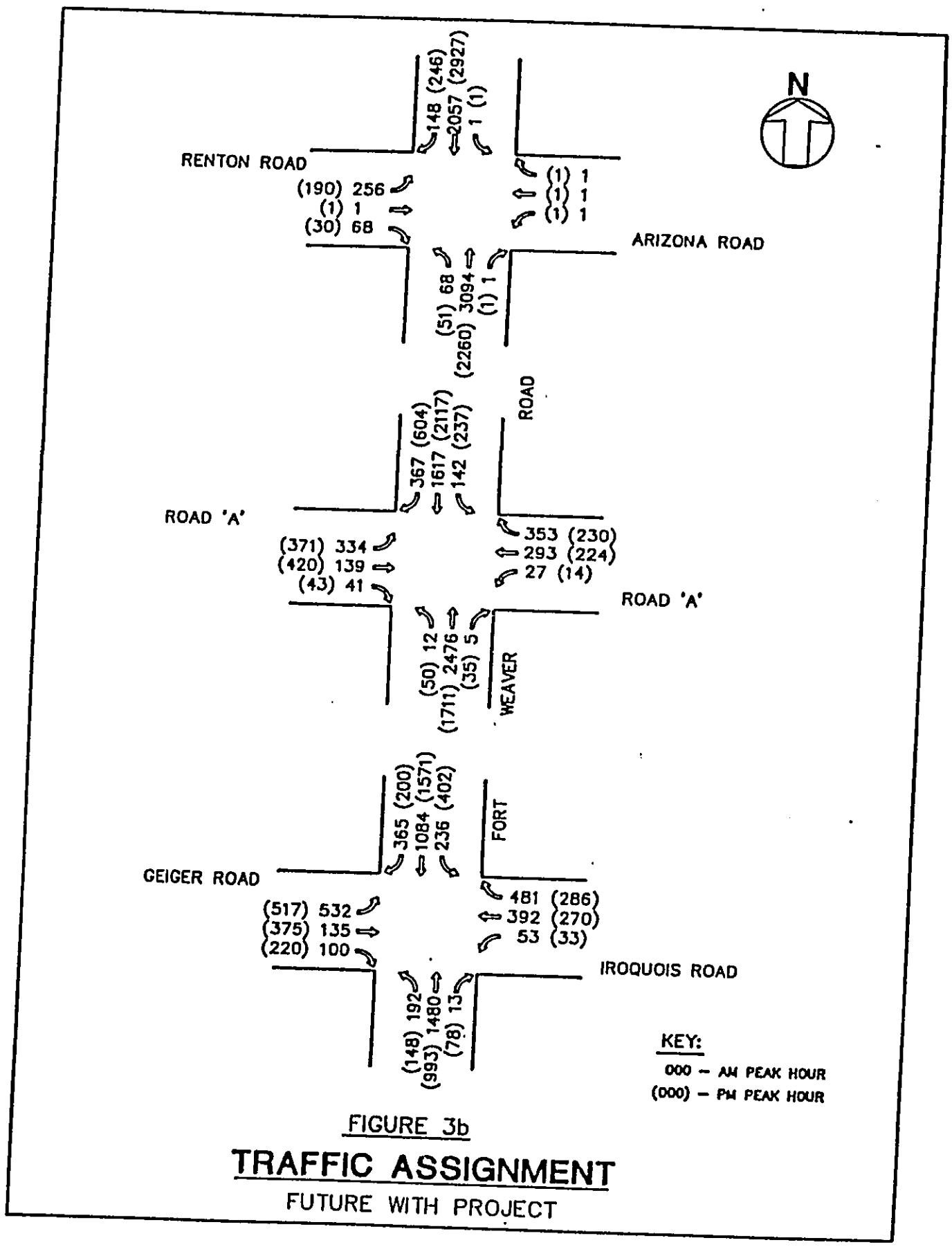

FIGURE 3b

TRAFFIC ASSIGNMENT

FUTURE WITH PROJECT

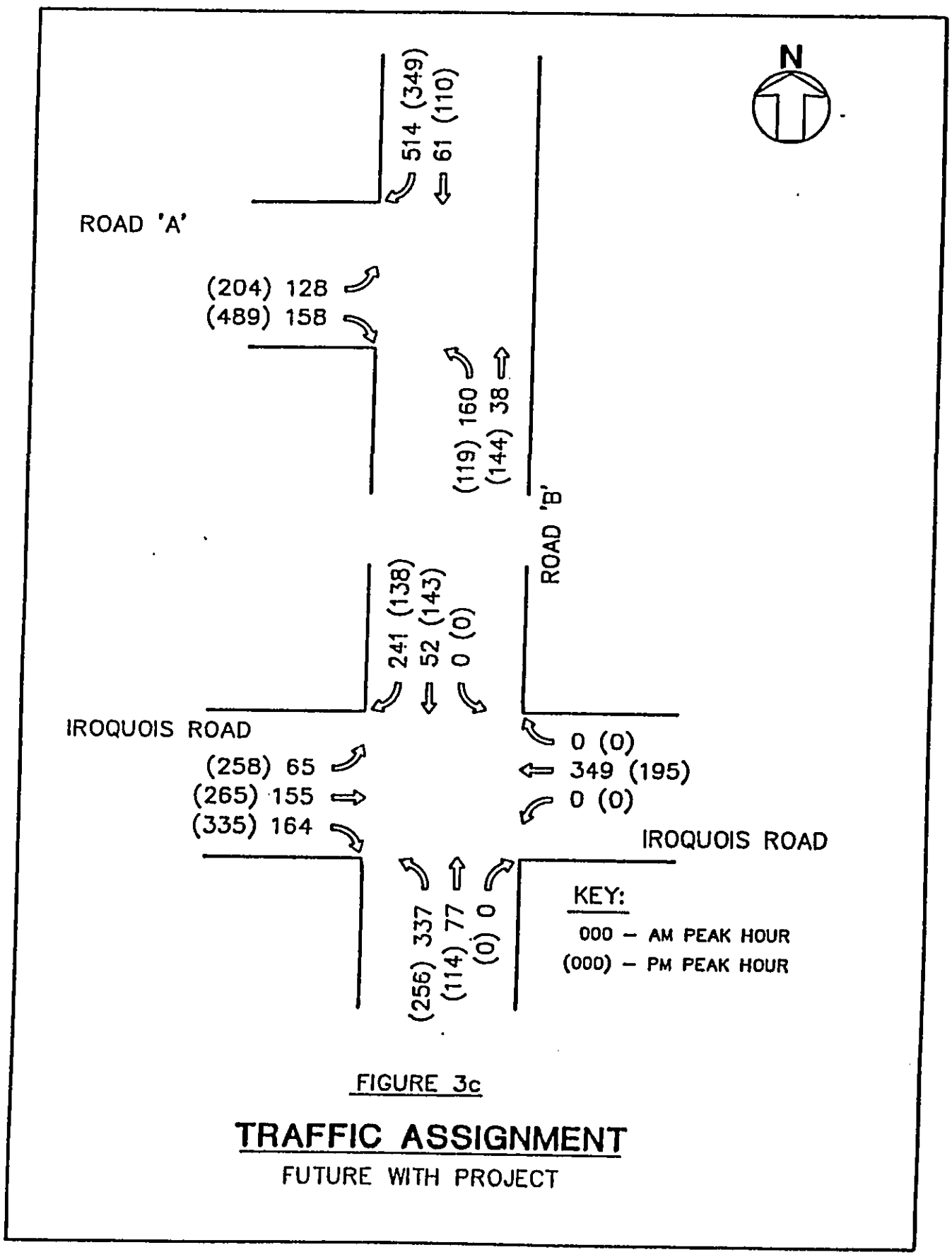

FIGURE 3c

TRAFFIC ASSIGNMENT

FUTURE WITH PROJECT

PROJECT IMPACTS

The project is expected to be completed in year 1996. The project will have an impact on the immediate area of Fort Weaver Road and on a regional basis which would include Kunia Interchange and the H-1 Freeway. The partial completion (1,300 units) of the Ewa Marina project, located south of the proposed project, was assumed to account for the other major project in the area. The Ewa Expandable Housing units, located north of the project site, is expected to be fully occupied as are 84 additional units for the elderly, also located north of the project.

Future Conditions

The analyses were conducted for a future case in which ridesharing would be an integral part of the entire transportation program. The ridesharing program is assumed to divert 17 percent of potential drivers into carpools as riders and 15 percent to buses, resulting in a potential reduction in project-generated traffic of nearly 25 percent.

Improvements will be needed along Fort Weaver Road to serve the additional traffic. While the Renton Road and Arizona Road approaches would remain unchanged, the Fort Weaver Road approaches would each require an additional lane at this intersection. Analysis of future conditions with the project shows that this intersection would operate at LOS C during the AM and PM peak hours (Table 4).

The project's east-west collector road, referred to as Road 'A', will intersect Fort Weaver Road at a new cross-intersection. Adequate capacities would be provided by the following laneage at this intersection: Fort Weaver Road's northbound approach would need a left turn only lane, two through lanes, and a shared lane for through and right turn traffic. The Fort Weaver Road southbound approach would have an exclusive left turn lane, three through lanes, and a right turn only lane. The eastbound approach on Road 'A' would contain two left turn lanes, two through lanes, and a right turn lane. The westbound

TABLE 4

LEVELS OF SERVICE

SIGNALIZED INTERSECTIONS	EXISTING CONDITIONS		FUTURE WITH PROJECT	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Fort Weaver Road/Renton Road	B	B	C	C
Fort Weaver Road/Road 'A'	--	--	D	D
Fort Weaver Road/Geiger Road	B	B	D	D
MULTILANE HIGHWAY				
Fort Weaver Road (4-Lane Section North of Renton Road)				
Northbound lanes	B	B	E	D
Southbound lanes	B	B	C	E

Notes: AM = Morning, PM = Afternoon

approach would require a single left turn lane, two through lanes, and two right turn lanes. The volumes projected at this intersection would meet the Manual on Uniform Traffic Control Devices[3] (MUTCD) Warrant 11 criteria for signalization (peak hour volumes). This signalized intersection would operate at LOS D during both peak hours.

The signalized intersection of Fort Weaver Road and Geiger Road northbound approach requires a left turn lane, two through lanes, and a shared lane for through and right turn movements. The southbound approach would be similar except that it would have two left turn lanes. The eastbound Geiger Road approach would be striped for two left turn lanes, a through lane, and a right turn lane. The westbound Iroquois Road approach would have a left turn lane, two through lanes, and two right turn lanes. The Geiger Road/Fort Weaver Road intersection would experience LOS D conditions during the AM and PM peak hours.

The project's internal roadway system will create four new major intersections. The North-South Road, located west of Fort Weaver Road, would form a T-intersection with Road 'A' and a cross-intersection with Geiger Road. Road 'B' would be a minor north-south roadway within the east half of the project site. Road 'B' would intersect Road 'A' in a T-intersection and Iroquois Road in a cross-intersection. Table 5 shows the LOS for the internal intersections.

Road 'A' will intersect the North-South Road in an unsignalized T-intersection with Road 'A' forming the stem. The approaches on North-South Road would each contain one through traffic lane with separate lanes for turns onto Road 'A'. The North-South Road would be a two-lane roadway. Separate lanes for left and right turns from Road 'A' should be provided. The westbound left turn traffic from Road 'A' would at LOS A and LOS E during the AM and PM peak hours respectively. The westbound right turn traffic would experience LOS A conditions during both peak hours while the southbound left turns off of the North-South Road would operate at LOS A both peak hours.

TABLE 5

INTERNAL INTERSECTION LEVELS OF SERVICE

	FUTURE WITH PROJECT	
	AM Peak Hour	PM Peak Hour
TWO-LANE HIGHWAY		
North-South Road	C	D
UNSIGNALIZED INTERSECTIONS		
North-South Road/Road 'A'		
Westbound left turn	C	E
Westbound right turn	A	A
Southbound left turn	A	A
Road 'B'/Road 'A'		
Eastbound left turn	C	B
Eastbound right turn	A	A
Northbound left turn	A	A
SIGNALIZED INTERSECTIONS		
North-South Road/Geiger Road	D	D
Iroquois Road/Road 'B'	C	C

The North-South Road/Geiger Road intesection's northbound, southbound, and westbound approaches should contain separate lanes for left turns, through traffic, and right turns. The eastbound approach should have a separate left turn lane and a shared lane for through and right turn traffic. The estimated traffic volumes at this intersection would satisfy MUTCD Warrant 11 requirements for signalization (peak hour). As a signalized intersection, it would function at LOS D during the AM and PM peak hours.

The Road 'B'/Road 'A' T-intersection would have adequate capacity as an unsignalized intersection. Both approaches on Road 'B' should have separate lanes for through and turn movements while the Road 'A' approach should have separate lanes for left and right turn traffic. The eastbound left turn traffic from Road 'A' would experience LOS C and LOS B conditions during the AM and PM peak hours, respectively. The eastbound right turns from Road 'A' and northbound left turns off of Road 'B' would be LOS A during both peak hours.

The Iroquois Road/Road 'B' cross-intersection would also meet the MUTCD peak hour warrant for signalization. Iroquois Road eastbound approach should have separate lanes for left turns, through traffic, and right turns. The remaining approaches should have a left turn only lane and a shared lane for through and right turn traffic. As a signalized intersection, it would operate at LOS C during the AM and PM peak hours.

The analysis of the four-lane Fort Weaver Road between Renton Road and Farrington Highway indicates near-capacity conditions. The northbound lanes would operate at LOS E while the southbound lanes would operate at LOS C during the AM peak hour. The northbound lanes would be at LOS D and the southbound lanes would be LOS E during the PM peak hour.

Traffic volumes north of the project on the North-South Road would be lower and a two-lane highway would adequately serve the projected volumes. The North-South Road would operate at LOS C and LOS D during the AM and PM peak hours, respectively.

The project would also affect the intersection of Kunia Road and the eastbound on-ramp to the H-1 Freeway, located north of the project, where existing poor conditions would become worse with increases in traffic volumes due to the project and other development.

MITIGATION MEASURES

Fort Weaver Road would require improvements to provide the necessary capacity for the estimated traffic volumes. A ridesharing program would also be necessary to reduce critical volumes on Fort Weaver Road and at the intersections on Fort Weaver Road.

An additional traffic lane in each direction would provide the required capacity on the segment of Fort Weaver Road between Renton Road and Iroquois Road. To encourage full utilization of the added northbound lane on Fort Weaver Road, it should begin south of Iroquois Road and continue past Renton Road and continue at least 1,000 feet north of the Renton Road/Fort Weaver Road intersection. The added southbound lane on Fort Weaver Road should begin north of Renton Road as a shared lane for through and right turn traffic and terminate at least 1,000 feet south of Iroquois Road. Figure 4 shows the lanes needed on Fort Weaver Road and the cross-streets.

The four-lane Fort Weaver Road north of the project would suffice if a ridesharing program is implemented. The estimated traffic volumes on Fort Weaver Road, which reflect a 24.8 percent reduction in the peak directions, would remain at under-capacity conditions. This reduction in traffic could be achieved with 17 percent of the eastbound (toward Honolulu) driver population shifting to carpools and 15 percent shifting to buses.

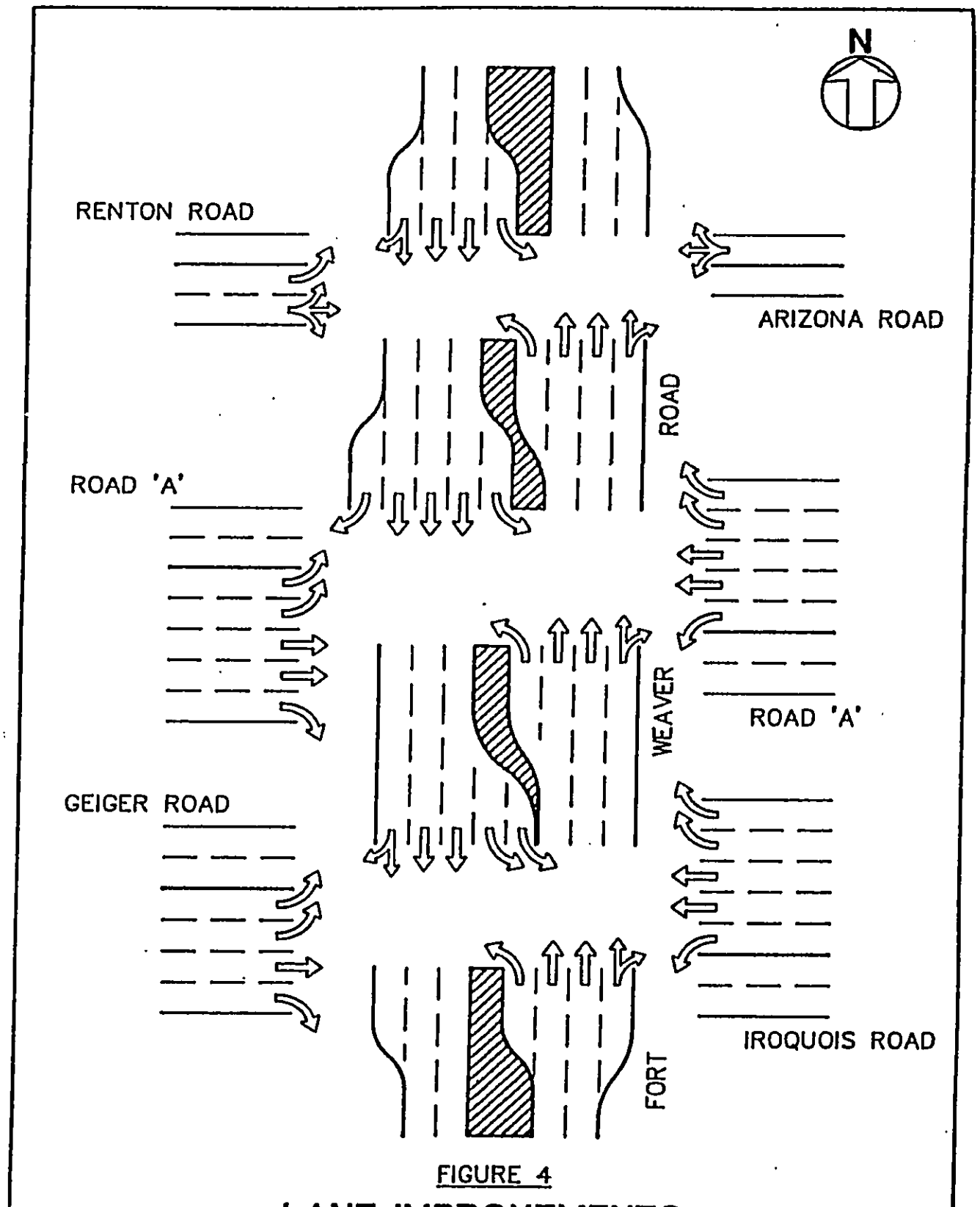

FIGURE 4

LANE IMPROVEMENTS

CONCLUSIONS AND RECOMMENDATIONS

Adequate service to/from the H-1 Freeway could be accomplished with lane improvements on Fort Weaver Road and the implementation of a ridesharing program. Under these conditions, the intersections on Fort Weaver Road and within the proposed project site would all have adequate capacities to serve the projected future traffic demands.

If the expected growth of the project and in the Ewa area occur, the large travel demands between Ewa and downtown Honolulu may justify extending the City and County of Honolulu's proposed rapid transit system to the Ewa area. Successful implementation of a ridesharing program would be a first step toward a transit-oriented transportation system, which would minimize the highway improvements necessary to accommodate the increasing travel demands.

REFERENCES

1. Transportation Research Board, National Research Council, Highway Capacity Manual, Special Report 209, Washington, D.C., 1985.

2. Institute of Transportation Engineers, Trip Generation, Fourth Edition, Washington, D.C., 1987.

3. U.S. Department of Transportation, Federal Highway Administration, Manual on Uniform Traffic Control Devices for Streets and Highways, 1978, as amended.

APPENDIX

The Highway Capacity Manual defines six Levels of Service, labelled A through F, from best to worst conditions. Levels of Service for signalized and unsignalized intersections are defined in terms of average user delays. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

Unsignalized Intersections

For unsignalized intersections, the Highway Capacity Manual evaluates gaps in the major street traffic flow and calculates capacities available for left turns across oncoming traffic and for left and right turns onto the highway from the minor street.

LEVEL OF SERVICE A: Little or no delay.
LEVEL OF SERVICE B: Short traffic delays.
LEVEL OF SERVICE C: Average traffic delays.
LEVEL OF SERVICE D: Long traffic delays.
LEVEL OF SERVICE E: Very long traffic delays.
LEVEL OF SERVICE F: Demand volume exceeds capacity, resulting in extreme delays with queuing that may cause severe congestion and affect other movements at the intersection.

Signalized Intersections

For signalized intersections, the Operational Analysis measures signal operations by two separate indicators, volume-to- capacity (v/c) ratios and Level of Service. The v/c ratios provide a comparison of the traffic demands to the theoretical capacity of the intersection while levels of service are deter- mined from the estimated delay. These two indicators do not necessarily correlate to each other.

LEVEL OF SERVICE A: This level describes operations with very low delay, i.e., less than 5.0 seconds 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: This level describes operations with delays in the range of 5.1 to 15.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher average delays.

LEVEL OF SERVICE C: This level describes operations with delays in the range of 15.1 to 25.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear as the number of vehicles stopping is significant; many vehicles, however, still pass through the intersection without stopping.

LEVEL OF SERVICE D: This level describes operations with delays in the range of 25.1 to 40.00 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from a combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LEVEL OF SERVICE E: This level describes operations with delays in the range of 40.1 to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures (queued vehicles do not clear in one cycle) are frequent occurrences.

LEVEL OF SERVICE F: This level describes operation with delay in excess of 60.0 seconds 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 length may also be major contributing causes to such delay levels.

Two-Lane Highways

The analysis of two-lane highways evaluates percent time delay with speed and capacity utilization serving as secondary measures.

LEVEL OF SERVICE A: Motorists are able to drive at their desired speeds. Passing demand is well below capacity and almost no platoons of three or more vehicles are observed. Drivers would be delayed no more than 30 percent of the time by slow-moving vehicles.

LEVEL OF SERVICE B: Passing demand approximately equals passing capacity. Drivers may be delayed up to 45 percent of the time, the number of platoons forming in the traffic stream begins to increase dramatically.

LEVEL OF SERVICE C: Traffic flows increase, resulting in noticeable increases of platoon formation, platoon size, and frequency of passing impediment; chaining of platoons and significant reductions of passing capacity begin to occur. Traffic flows are stable, but is susceptible to congestion caused by turning movements and slow-moving vehicles. Motorists may be delayed up to 60 percent of the time.

LEVEL OF SERVICE D: Traffic flows become unstable. The two opposing traffic streams essentially begin to operate separately as passing becomes extremely difficult. Passing demand is high, while passing capacity approaches zero. Average platoon sizes of 5 to 10 vehicles are common. Turning vehicles and/or roadside distractions cause major shock waves in the traffic stream. Delays for motorists may approach 75 percent of the time. This is the highest flow rate that can be maintained without a high probability of breakdown.

LEVEL OF SERVICE E: Traffic flows experience delays more than 75 percent of the time. Passing is virtually impossible and platooning becomes intense when slower vehicles of other interruptions are encountered. Traffic volumes may reach capacity of the highway. Operating conditions at capacity are unstable and difficult to predict or maintain; Level of Service E is a transient condition and perturbations in traffic flows would cause a rapid transition to Level of Service F.

LEVEL OF SERVICE F: Heavily congested flow with traffic demand exceeding capacity. Volumes are lower than capacity and speeds are below capacity speeds.

Multilane Highways

The analysis of multilane highways evaluates the maneuverability of vehicles within the traffic stream which is quantified as density.

LEVEL OF SERVICE A: This service level represents unrestricted free-flow conditions. Minor incidents or breakdowns on the highway will have little effect on the traffic at this level.

LEVEL OF SERVICE B: This service level is characterized by smooth or stable free-flow conditions. Flow deterioration due to minor incidents or breakdowns is slightly more severe than LOS A.

LEVEL OF SERVICE C: Highway flows are stable but are more sensitive to increases in traffic volumes. Restriction of manueverability becomes noticeable at this level. Minor incidents or breakdowns may cause queues to form which will have a significant impact on traffic flow.

LEVEL OF SERVICE D: This service level borders on unstable flow on the highway. Driver manueverability becomes very limited. Minor incidents or breakdowns can cause substantial queuing.

LEVEL OF SERVICE E: This service level describes capacity conditions. The operation of the highway becomes very unstable because usable gaps in the traffic stream are virtually non-existent. At this LOS, the traffic stream loses its ability to dissipate minor disruptions.

LEVEL OF SERVICE F: Capacity of the highway is exceeded and motorists experience forced flow conditions.