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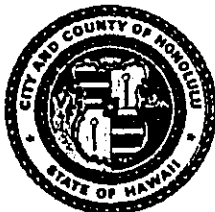
DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

RECEIVED

FRANK F. FASI
MAYOR

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Benjamin B. Lee

CHIEF PLANNING OFFICER

OFF. OF ENVIRONMENTAL
QUALITY CONTROL

RH/DGP 12/89-4614

January 16, 1990

Honorable Marvin T. Miura, Director
Office of Environmental Quality Control
State of Hawaii
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

*Ko Olin Terai's
Complex*

NEGATIVE DECLARATION

LOCATION

PROPOSED ACTION

Ko Olin Resort
Ewa, Oahu
Tax Map Key: 9-1-15: por. 3

To redesignate 9 acres from Low
Density Apartment to Commercial
on the Ewa Development Plan
Land Use Map

CONTACT

Mr. Ernest Takahashi
Wilson Okamoto & Associates, Inc.
1150 South King Street, Suite 800
Honolulu, Hawaii 96814
Telephone: 531-5261

REASONS SUPPORTING DETERMINATION

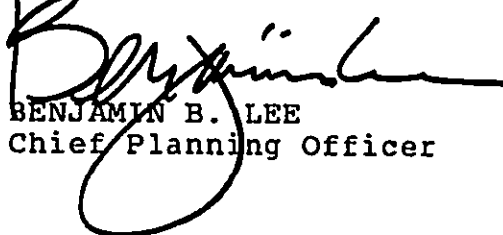
The anticipated effects of the proposed action based on the
attached assessment are not significant enough under the
criteria of Section 11-200-12 of the EIS Rules to warrant the
preparation of an EIS.

This determination does not constitute approval of the
applicant's request for a Development Plan amendment or
subsequent development approvals.

Honorable Marvin T. Miura, Director
Page 2
January 16, 1990

Please call Randy Hara at 523-4483 if there are any questions.

Sincerely,



BENJAMIN B. LEE
Chief Planning Officer

BBL:js

cc: Wilson Okamoto and Associates, Inc.

Attachments

1990-01-23-0A-FBA

Application for
Development Plan Amendment
and Environmental Assessment

* *Ko Olina*
Tennis Center *



Ko Olina Resort

Prepared For:
West Beach Estates

Prepared By:
Wilson Okamoto & Associates, Inc.

December 1989

DGP REF. NO.:
MAP REF. NO.:
NB AREA: Ewa NB 23
ACREAGE: 9.0 of 19.6 Acres
TMK: 9-1-15: Portion 3

EWA
DEVELOPMENT PLAN LAND USE AMENDMENT
BEING PROPOSED

Amendment/Project Information

Amendment Request: Amendment to the Ewa Development Plan Land Use Map from Low Density Apartment to Commercial.

Location: Ko Olina Resort, Ewa District, island of Oahu.

Address(s) of the Subject Area--Where Applicable: Inapplicable

Owner/Developer: West Beach Estates

Requested By: West Beach Estates (Applicant)
Wilson Okamoto & Associates, Inc. (Agent)

Basis for Request: To enable the development of a central tennis facility to help meet the Resort's demand for tennis facilities.

Type of Project: A planned tennis complex featuring standard tennis courts, a stadium court, teaching court, clubhouse, and a restaurant.

Impact on Provision of Housing: Land required for the Tennis Center will result in a reduction of planned low density apartment units (approximately 130 units) on the project site. Implications of this development cost reallocation are deemed by the developer to be justified by the benefits received by providing the Tennis Center.

Existing Conditions

Land Use: Vacant undeveloped

Structures

Number: None
Type: Inapplicable
Height: Inapplicable

Present Plan/Zoning Designations

State Land Use: Urban

DP Public Facilities Map: A public school facility is indicated near the project area. Privately-developed sewer and potable and non-potable water lines within the area are also indicated as planned on the existing Facilities Map.

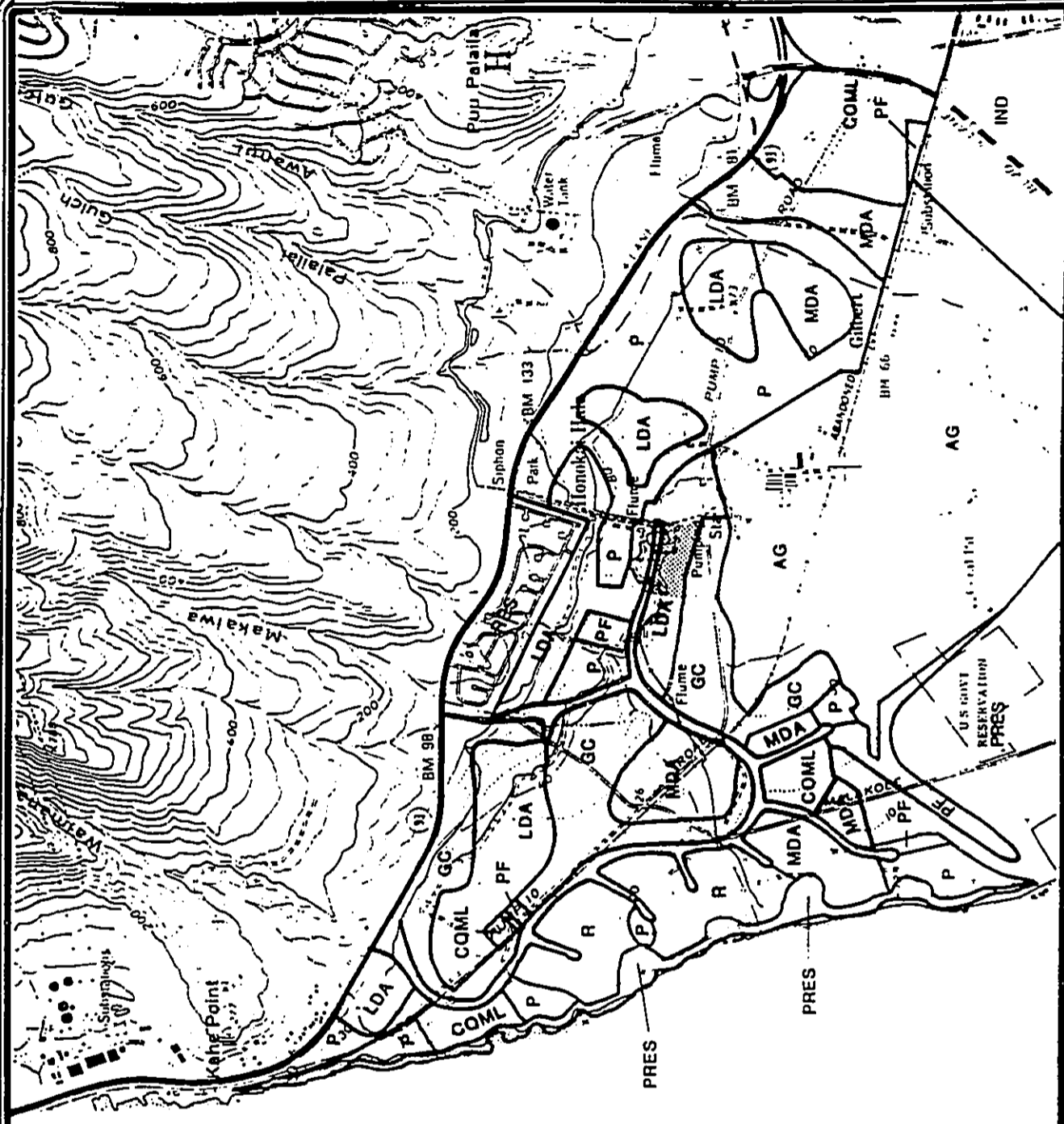
DP Special Provisions: The "West Beach Special Area" is designated to be "a water-oriented residential and resort community containing a mixture of Low Density Apartment, Medium Density Apartment, Resort, Commercial (comprised of a major shopping complex and a smaller neighborhood shopping area), Public Facility, Park and Preservation uses".

Zoning: A-1 Low Density Apartment District

ALISH: The project site was previously used for sugar cane cultivation by the Oahu Sugar Company, and has since been mass graded for the development of the Ko Olina Resort.

Soil Features: Lualualei-Fill land-Ewa association which are deep, nearly level to moderately sloping soils, and are well-drained, with fine textured or moderately fine textured subsoil or underlying material, with a slight erosion hazard.

Possible Constraints: None



LEGEND

- RES- Residential
- R- Resort
- AG- Agriculture
- PRES- Preservation
- IND- Industrial
- GC- Golf Course
- P- Park
- LDA- Low Density Apt
- MDA- Medium Density Apt
- COML- Commercial
- PF- Public Facility
- Proposed LDA to Commercial



KO OLINA TENNIS CENTER
 Ko Olina Resort
 West Beach Estates

Fig. 5
 COUNTY DP LAND USE

Prepared by:
 WILSON OKAMOTO & ASSOCIATES, INC.

APPLICATION FOR DEVELOPMENT PLAN AMENDMENT
AND ENVIRONMENTAL ASSESSMENT

KO OLINA RESORT
TENNIS CENTER

Applicant: WEST BEACH ESTATES

Agent: WILSON OKAMOTO & ASSOCIATES, INC.

December 1989

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I. INTRODUCTION

West Beach Estates is requesting an amendment to the Ewa Development Plan Land Use Map to enable the development of the Ko Olina Tennis Center on a portion on land currently designated as Low Density Apartment on the east end of the Resort. The Tennis Center is proposed on approximately 9.0 acres of land whose land use designation is requested to be changed to Commercial.

With the development of the Ko Olina Resort now well underway, the need has arisen for the Resort to provide a first-class tennis facility in a suitable location on the Resort. The development of a central tennis facility is expected to enhance the Resort's competitiveness and round out the overall amenity program. The Tennis Center will also enable the hosting of professional and local tennis tournaments which will serve as an added entertainment attraction for visitors and residents.

This Development Plan Application and Environmental Assessment was prepared to satisfy the requirements of Chapter 343, Hawaii Revised Statutes and the informational requirements of the Development Plan amendment process. The proposed action is not anticipated to generate any significant adverse impacts on the environment.

SUMMARY OF PROPOSED ACTION

Applicant: West Beach Estates

Landowner: West Beach Estates

Accepting Agency: Department of General Planning

Project Location: Ewa, Oahu, Hawaii

Project Area: 9.0 acres

Tax Map Key: 9-1-15: portion of 3

State Land Use District: Urban

Development Plan Designation: Low Density Apartment

Proposed DP Designation: Commercial

Zoning: A-1 Low Density Apartment District

Existing Use: Vacant undeveloped

Proposed Use: Tennis center complex, including clubhouse and restaurant facilities.

Consulted Agencies: Department of General Planning
Department of Land Utilization

II. DESCRIPTION OF THE PROPERTY

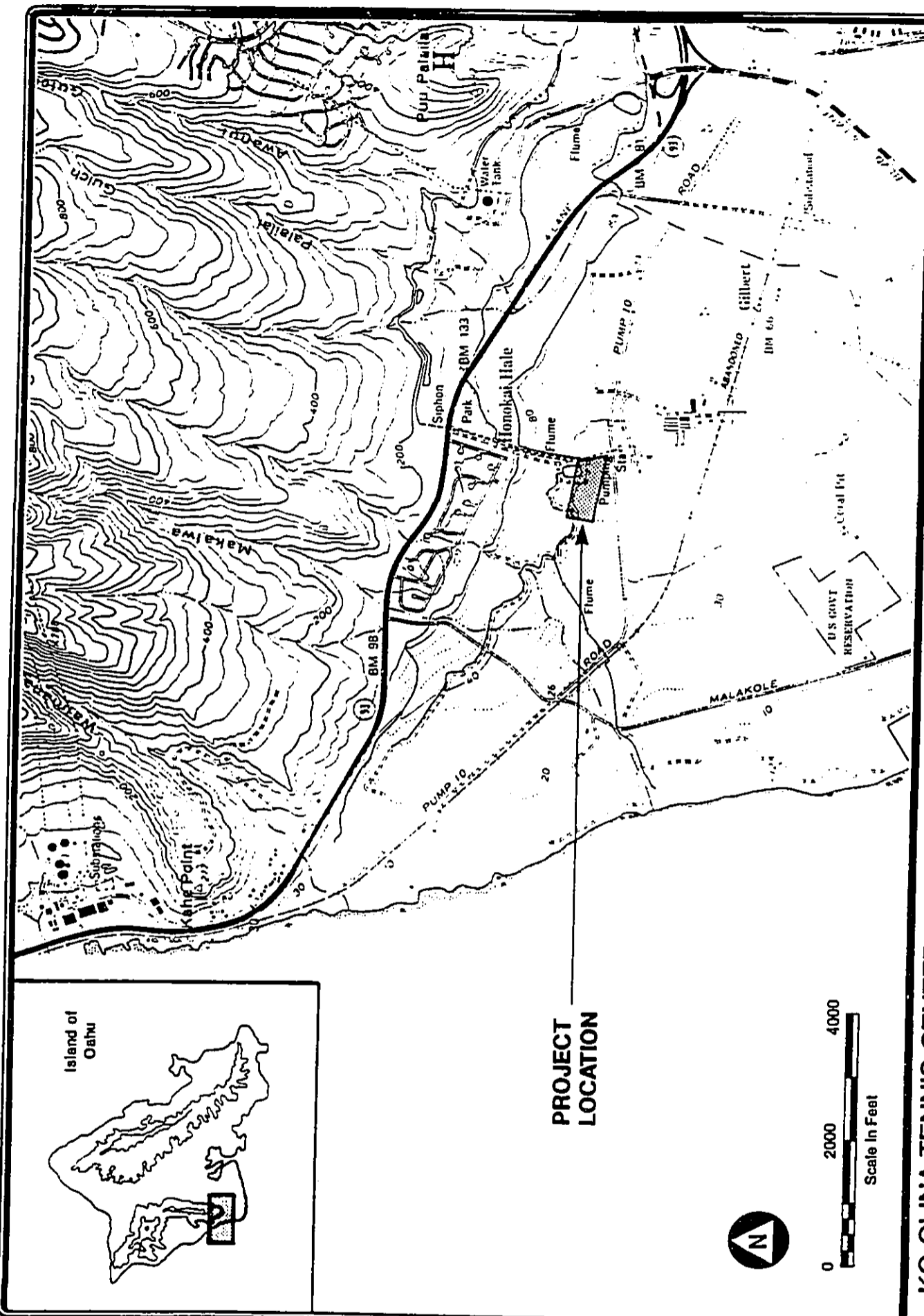
A. LOCATION

The project site is within the Ewa District, island of Oahu, approximately 20 miles west of Honolulu. (See Figure 1.) The proposed Ko Olina Tennis Center is located within the Ko Olina Resort on a portion of land currently designated for low density apartment development on the eastern end of the resort. The project site encompasses a land area of approximately 9.0 acres. The property boundaries are delineated by the following: to the north by planned low-density apartments and a future public elementary school; to the west by planned low-density apartments; and to the south by a portion of the resort's 18-hole championship golf course. To the east, the property is adjacent to planned low-density apartments within the proposed Ko Olina Resort Phase II development. The site is approximately a mile inland from the coast and is accessed by the main loop road and the recently completed Ko Olina Interchange.

The property is designated as Tax Map Key 9-1-15: portion 3.

B. LAND OWNERSHIP

The land underlying the Tennis Center is owned in fee by West Beach Estates, Hawaii general partnership, whose general partners are Horita Corporation, a Hawaii Corporation, and SKG Properties, a Hawaii general partnership.



KO OLINA TENNIS CENTER
 Ko Olina Resort
 West Beach Estates

Fig. 1
LOCATION MAP

Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

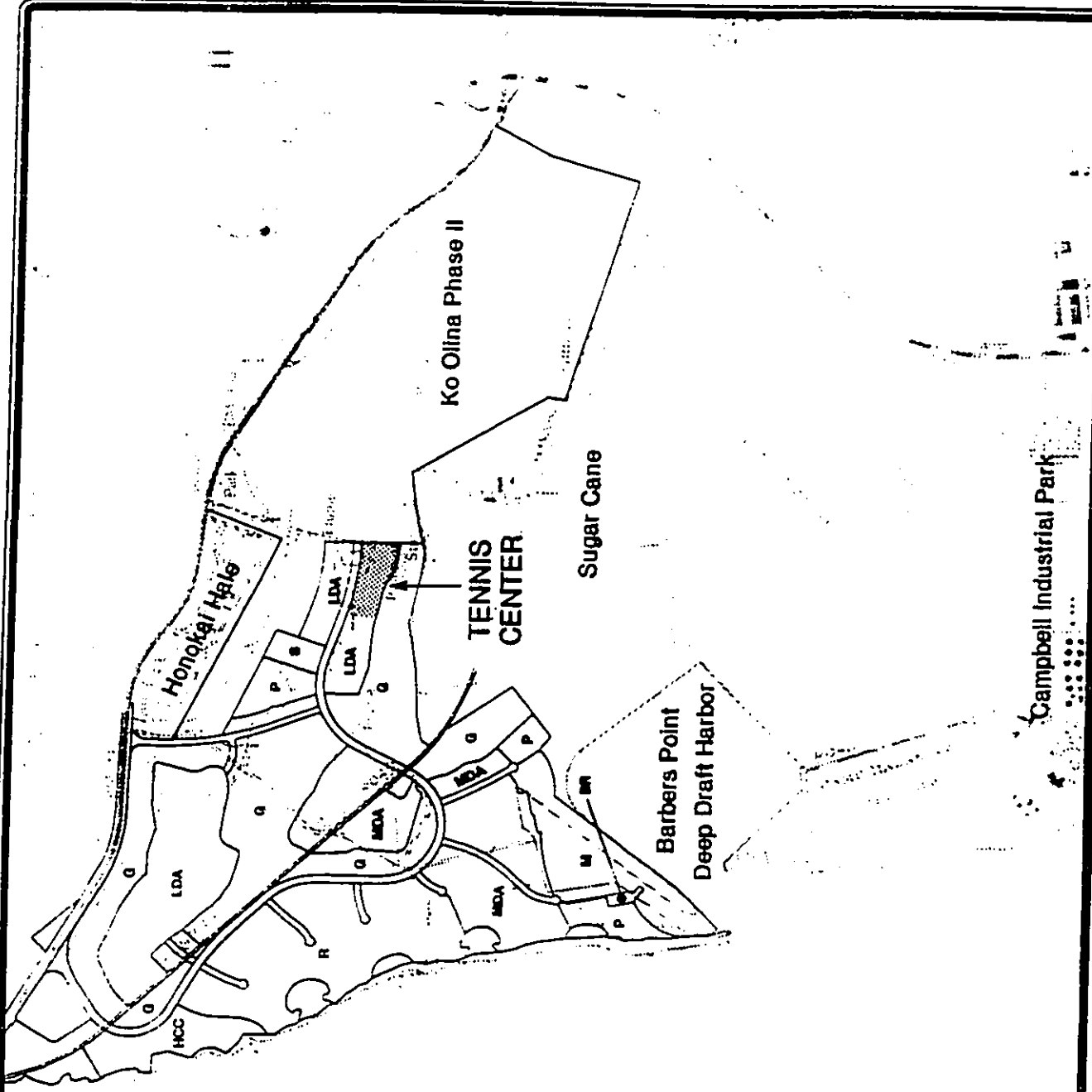
C. EXISTING LAND USES

The project site has been mass graded and is presently vacant and undeveloped. Access and infrastructure to serve the site have been provided.

D. SURROUNDING LAND USES

Surrounding land uses in the immediate vicinity of the project site include the following: planned low-density apartments, a future public elementary school, and a portion of the existing 18-hole championship golf course (See Figure 2).

The Ko Olina Resort is a 642-acre planned residential/resort community, which will consist of 4,000 visitor units and 5,200 housing units of which 3,700 units will be medium-density apartments and 1,500 units will be low-density units. Planned amenities within the development include: 4 oceanfront sandy beach lagoons; a 170-acre, 18-hole championship golf course and clubhouse; a 450-slip marina; a Hawaiian cultural center; three public parks consisting of two large beach parks and a community park; sites for a school, child care center, and fire station; and two commercial centers, one featuring a waterfront theme shopping center. The project is expected to create at least 5,850 new permanent jobs. Site work and infrastructure development have been largely completed, and construction of the first hotels is expected to begin within the next year.



LEGEND

- P Park
- LDA Low Density Apartments
- MDA Medium Density Apartments
- G Golf Course
- M Marina
- BR Boat Ramp
- HCC Hawaiian Cultural Center
- R Resort
- S School



KO OLINA TENNIS CENTER
 Ko Olina Resort
 West Beach Estates

Fig. 2
SURROUNDING LAND USES

Prepared by
 WILSON OKAMOTO & ASSOCIATES, INC.

Low-Density Apartments: Low-density multi-family residential units are planned for the adjacent areas to the north, west and east of the project site. The 11.2 acre parcel located north of the Tennis Center is planned to include approximately 130 units, and the 10.6 acre parcel located west is planned for approximately 150 units. An adjacent 9.8 acre parcel east of the Tennis Center within the proposed Ko Olina Resort Phase II is planned for approximately 167 low density units.

Elementary School: A site for a future public elementary school has been reserved on a 6-acre parcel to the northwest of the proposed Tennis Center parcel. The school will accommodate the additional student enrollment generated by the planned addition of residential units. The school will be developed when student enrollment generated by the Ko Olina Resort population is sufficient to justify a new school facility.

Golf Course and Clubhouse Facilities: A portion of the recently completed 18-hole championship golf course with a driving range and a clubhouse to be built lies south of the Tennis Center. A portion of the golf course borders the southern boundary of the project site and preserves open space and viewplanes.

Other surrounding uses: Located just north and east of the proposed Tennis Center is the proposed Ko Olina Resort Phase II development, encompassing a land area of 372.6 acres. Phase II will provide the necessary amenities to support the first phase, including development of a second 18-hole championship golf course, low-and medium-density apartment

units, and commercial development.

Located approximately a quarter mile north of the project site at its closest point is the existing residential tract of Honokai Hale/Nanakai Gardens Subdivision. This established residential community has an estimated population of 1,150 in approximately 290 residential units.

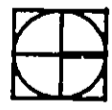
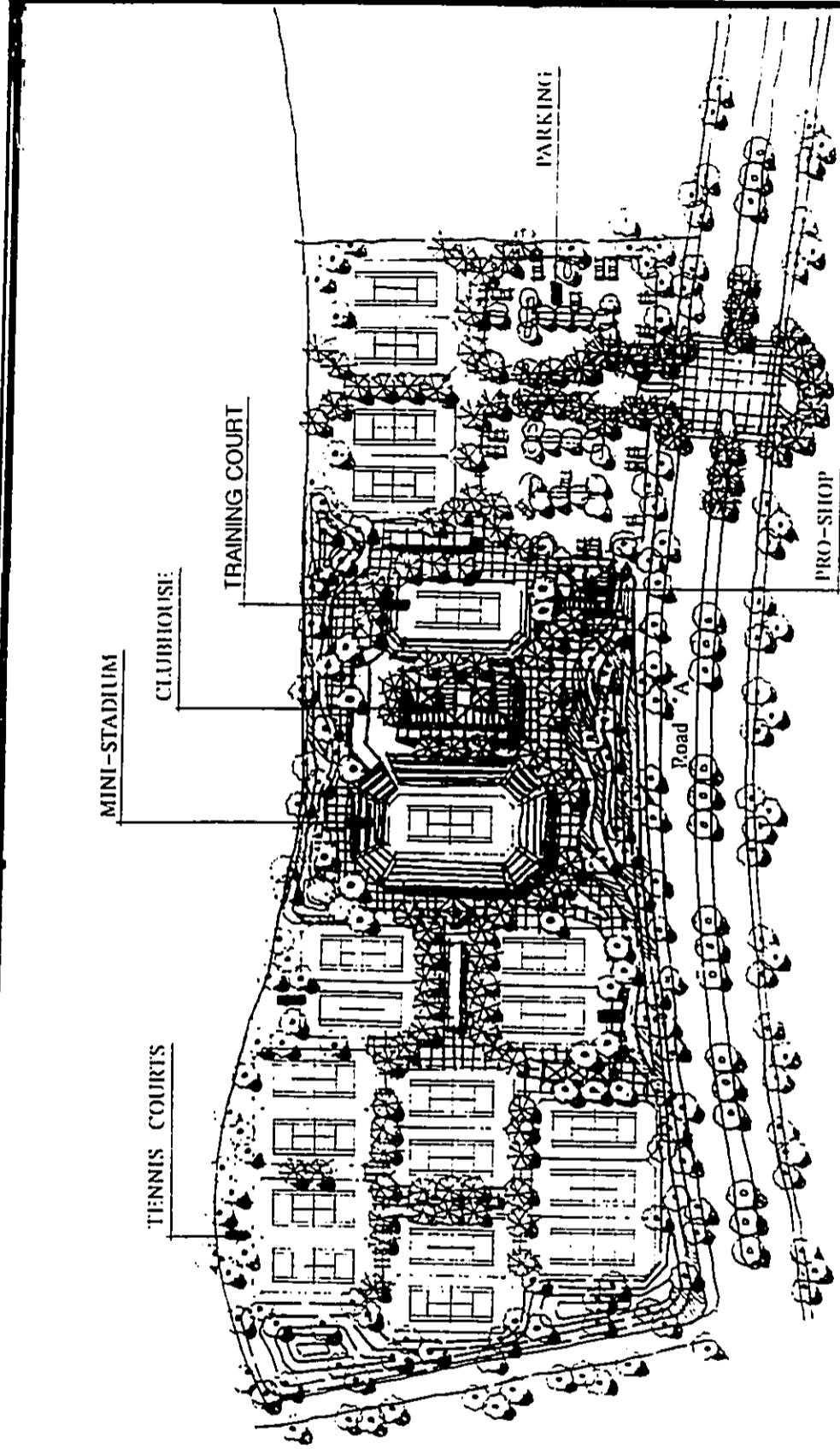
III. DESCRIPTION OF THE PROPOSED PROJECT

A. PROJECT DESCRIPTION

The Ko Olina Tennis Center is designed to be one of the finest tennis facilities in the State. The Tennis Center is planned to include the full complement of tennis facilities and serve as an attractive recreational amenity for resort guests and residents. The goal of the Ko Olina Tennis Center is to promote, develop, and organize a comprehensive program for the hotel guests, residents of the resort, as well as members of the general community. In this regard, the Center will be designed and be capable of hosting a wide range of tennis and special events for the community, including professional tennis tournaments, collegiate competitions, celebrity tennis events, and similar tournaments and clinics.

The Tennis Center is proposed for development on 9.0 acres of land and will feature the following facilities (See Figure 3):

- o Up to twenty (20) standard tennis courts. Ten (10) courts will be initially constructed, with subsequent courts developed as play and demand increase with the development of the resort. Covered sun shade seating areas will be provided adjacent to all courts. Four of these standard courts are expected to have lighting for evening play.



Plan prepared by CYP

KO OLINA TENNIS CENTER
 Ko Olina Resort
 West Beach Estates

Fig. 3
CONCEPTUAL SITE PLAN

WILSON OKAMOTO & ASSOCIATES, INC.

- o A stadium court in the center of the complex with seating for 1,000 spectators. The stadium court may be designed as a partially sunken court with low profile seating around the court. The stadium court's design would be intended to create an impressive visual statement. The stadium court can also be used as a celebrity court. The clubhouse would be situated to maximize viewing potential of the stadium court.
- o A teaching court adjacent to the clubhouse with support facilities for individual or group lessons and clinics. This teaching court as well as the stadium court would also have lighting.
- o A clubhouse which includes a Pro-Shop and a locker/shower facility. The Pro-Shop would include ample space for merchandise storage and display in an area of approximately 2,000 square feet. Locker rooms and shower facilities would be provided for the convenience of players, members, and guests.
- o A restaurant and service bar area within the clubhouse of approximately 2,000 square feet for approximately 65 persons.

The Tennis Center will include a convenient drop off area for shuttle bus service and frequent service from the hotels and residences throughout the resort are expected to reduce dependence on autos. Parking will be provided for up to 50 automobiles in landscaped parking areas. During occasional tournament play in which larger crowds may be expected, parking will be permitted along the main collector road, and permission will be sought as needed for additional parking at the nearby school site on weekends.

B. PROJECT NEED

The proposed Tennis Center for the Ko Olina Resort arises from the general growth in demand for leisure-time activities and sports facilities. The development of a central tennis facility is expected to enhance the Resort's competitiveness and round out the overall amenity program. These additional benefits arise from the provision of an important outdoor recreational sport activity for the future Ko Olina resident population, a tennis club facility for residents, guests, employees and the surrounding community, and use of the Tennis Center as a promotional feature for the Resort.

The Tennis Center will enable the hosting of professional and local tennis tournaments which will serve as an added entertainment attraction for visitors and residents. The Tennis Center will also enable Tennis Ranch/Camp-type operations at the Resort. These involve an extended training experience which can be marketed to improve hotel occupancy during off-season periods.

The development of the Tennis Center on the site will result in the loss of developable low density residential apartment land. An estimated 130 units will be foregone by the developer because of the land area required for the Tennis Center. The implications of this development cost reallocation are deemed to be justified by the benefits received by providing the Tennis Center.

C. DEVELOPMENT TIMETABLE

The Tennis Center development will commence upon the receipt of all necessary governmental permits and approvals. Based on a one-year construction timetable, the Tennis Center would be completed by the end of 1992.

D. ESTIMATED COST

The preliminary estimate of the construction cost for the Tennis Center development is approximately \$5,000,000 in 1989 dollars.

IV. RELATIONSHIP TO PLANS, POLICIES AND CONTROLS

A. HAWAII STATE PLAN

The Hawaii State Plan, adopted in 1978 and revised in 1988, establishes the overall theme, goals, objectives and priority guidelines to guide the future long-range development of the State. The project supports and is consistent with the following State Plan objectives and policies:

Section 226-6 Objectives and Policies for the Economy - in General

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

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

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

Development of the Tennis Center will contribute to the activity and employment within the State's construction industry. Employment opportunities provided by the facility's operations will benefit the Leeward area.

Section 226-8 Objective and Policies for the Economy -
Visitor Industry

(b) (1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.

The Tennis Center development, with planned facilities to accommodate tennis tournaments and other special events, will support the promotion of Hawaii's visitor industry and improve the quality of the Ko Olina Resort destination area. The Tennis Center will provide recreational and social activities to meet the diverse needs of both visitors and residents of the resort.

Section 226-23 Objective and Policies for Socio-Cultural
Advancement - Leisure

(b) (2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.

(b) (5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.

(b) (6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.

The Tennis Center will help to fulfill the recreational needs of visitors, guests, and residents of the resort and surrounding communities by providing a range of activities to accommodate both current user groups as well as the demand that will be generated by future development and growth in the Ewa area.

B. STATE FUNCTIONAL PLANS

The Hawaii State Plan directs appropriate State agencies to prepare Functional Plans which address statewide needs, problems, and issues, and recommend policies and actions to mitigate those problems. Fourteen Functional Plans were prepared to implement the State Plan provisions in the areas of agriculture, transportation, conservation lands, education, tourism, water resources, energy, recreation, historic preservation, health, housing, higher education, employment, and human services. The following presents a review of the functional plans which are applicable to the proposed project.

State Tourism Functional Plan. The overall theme of the State Tourism Functional Plan is "the achievement of a visitor industry that constitutes a major component of steady growth for Hawaii's economy." The Plan addresses four subareas within the visitor industry, which include: tourism promotion, physical development, employment and career development, and community relations. The following implementing action is in compliance with the Tennis Center.

B(4)(d) Plan development of resorts in a coordinated manner to minimize loss of public recreational opportunities in designated visitor destination areas.

The planned Tennis Center is part of the overall Ko Olina Resort development and will improve the quality of the resort as a destination area. The facility will provide a variety of activities to meet the diverse needs of both visitors and residents of the resort.

State Recreation Functional Plan. The purpose of the State Recreation Functional Plan is to "assess present and potential demand and supply of outdoor recreation resources and to guide State and County agencies in acquiring or preserving lands of recreation value, providing adequate recreational facilities and programs, and ensuring public access to recreation areas." The proposed project complies with the following policies of the Recreational Plan.

Policy A(2) Ensure that intended uses for a site respect community values and are compatible with the area's physical resources and recreation potential.

Policy C(1) Maintain an adequate supply of recreation facilities and programs which fulfill the needs of all recreation groups.

Policy E(3) Coordinate visitor and resident recreation interests to achieve compatible recreation usage.

Development of the Tennis Center will accommodate the recreational activity needs of visitors, guests, and residents of the Ko Olina Resort and provide community programs and recreational opportunities for residents of the Secondary Urban Center.

C. STATE LAND USE DISTRICT CLASSIFICATION

The State Land Use Law is intended to preserve, protect, and encourage the development of lands in the State for uses which are best suited to the public health and welfare of Hawaii's people. Pursuant to the Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission has

classified all lands in the State into four land use districts: Urban, Agricultural, Conservation, and Rural. The 9.0-acre site is located entirely within the Urban district boundaries (See Figure 4). As such, the proposed use and development is fully consistent with its Urban land use designation.

D. OAHU GENERAL PLAN

The City and County of Honolulu General Plan specifies long-range objectives and policies to guide both the quantity and quality of future growth on Oahu. The Plan is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of Oahu and also provides broad policies which facilitate the attainment of the objectives of the Plan. The General Plan was first adopted in 1977 and subsequently amended in 1979, 1982, 1985, 1987, and 1988. The project is consistent with the following General Plan objectives and policies.

Population Objectives and Policies

Objective B. Policy 2 Provide adequate support facilities to accommodate future growth in the number of visitors to Oahu.

The proposed Tennis Center will provide the adequate recreational support facilities to accommodate the development and growth of the Ko Olina Resort by providing visitors, guests, and residents of the resort with recreational activities near the destination area.

Culture and Recreation

Objective D, Policy 2 Develop and maintain a system of regional parks and specialized recreation facilities.

Objective D, Policy 7 Provide for recreation programs which serve a broad spectrum of the population.

Objective D, Policy 9 Require all new developments to provide their residents with adequate recreation space.

Objective D, Policy 10 Encourage the private provision of recreation and leisure-time facilities and services.

The Tennis Center, designed as a specialized recreational facility, will accommodate the needs of a larger number of residents and visitors of the Resort. Development of this facility will provide additional recreational space for the Ko Olina Resort as well as for existing and planned residential developments in the Ewa area.

E. EWA DEVELOPMENT PLAN

Development plans guide the desired sequence, patterns, and characteristics of future development in further specification of the General Plan. As one of eight plans for Oahu, the Ewa Development Plan Area includes the area from Waipahu and Pearl Harbor to Nanaku'i, encompassing the southwestern corner of Oahu.

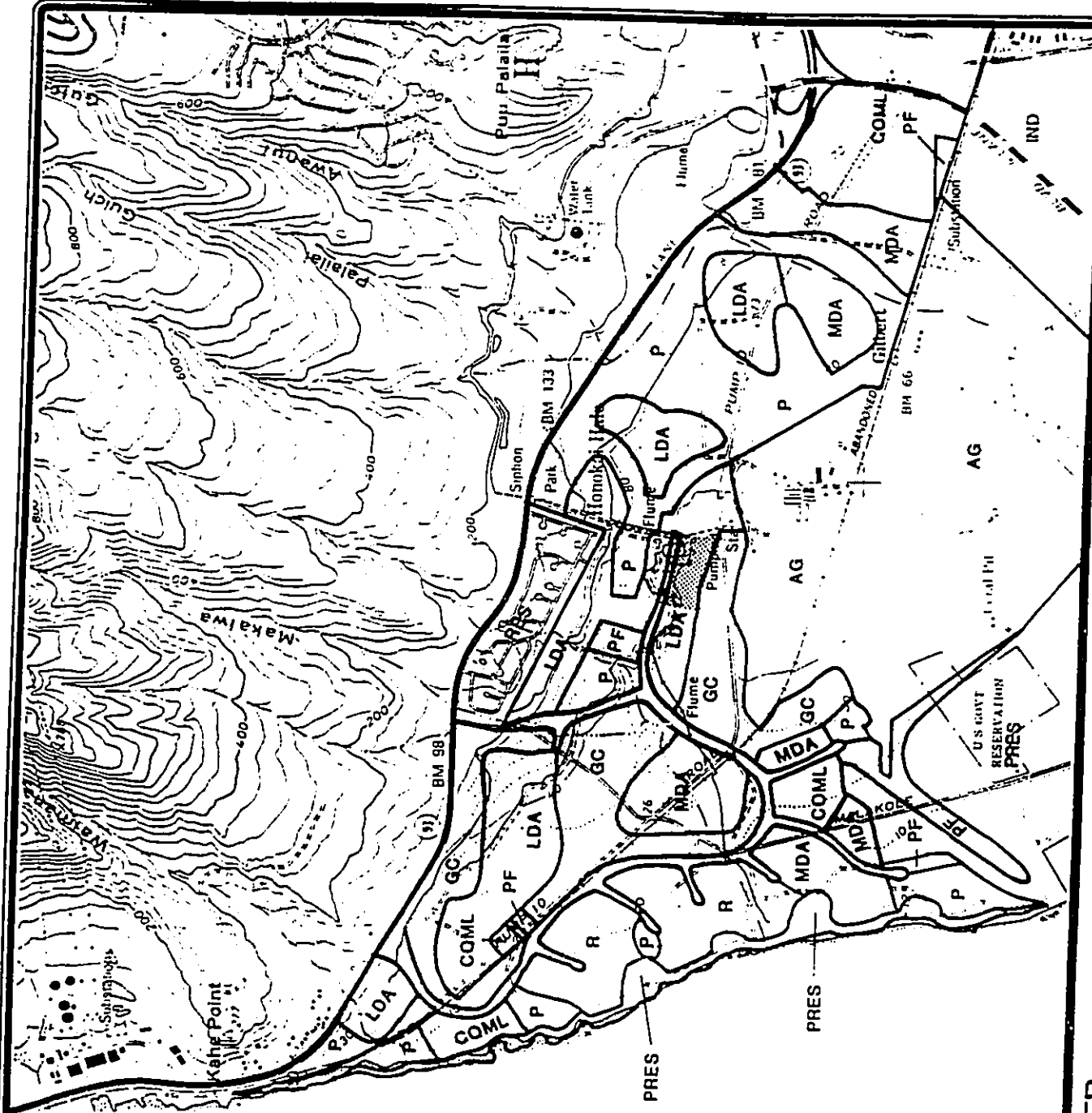
Special Provisions for Ewa. The Ewa Development Plan provides for the development of a new secondary urban center

in the area between West Beach and Makakilo to accommodate most of the expected influx of population into the area between now and the year 2005.

The Development Plan provides urban design principles and controls for open space, public views, heights and density. The Special Provisions also identify for selected areas the allowable uses, their location, setbacks, landscaping, and the provision of public facilities. Such Special Provisions have been developed for the Ko Olina Resort area which is referred to in the Ewa Development Plan as the "West Beach Special Area", and which is designated to be "a water-oriented residential and resort community containing a mixture of Low Density Apartment, Medium Density Apartment, Resort, Commercial (comprised of a major shopping complex and a smaller neighborhood shopping area), Public Facility, Park and Preservation uses".

Development Plan Maps for Ewa. The Development Plan Land Use Map depicts a land use pattern that is consistent with the objectives and policies of the general plan and is used as the basis for public facility planning. The Land Use Map for Ewa presently provides for Low Density Apartment use on the project site (See Figure 5). Low Density Apartment use provides areas for low-rise, low density multi-family residential structures.

The planned Tennis Center development will require an amendment to the Ewa Development Plan as it is not a permitted use in the Low Density Apartment designation. The 9.0-acre project site within the Low Density Apartment area will need to have its designation amended to Commercial to allow the Tennis Center development.



LEGEND

- RES- Residential
- R- Resort
- AG- Agriculture
- PRES- Preservation
- IND- Industrial
- GC- Golf Course
- P- Park
- LDA- Low Density Apt.
- MDA- Medium Density Apt.
- COML- Commercial
- PF- Public Facility
- Proposed LDA to Commercial



KO OLINA TENNIS CENTER
 Ko Olina Resort
 West Beach Estates

Fig. 5
 COUNTY DP LAND USE

Prepared by:
 WILSON OKAMOTO & ASSOCIATES, INC.

The existing and proposed acreages involved in the DP land use amendment for the 9.0-acre site are presented below.

	<u>Existing DP</u>	<u>Proposed DP</u>
Low Density Apartment	19.6	10.6
Commercial	0	9.0

The change from Low Density Apartment to Commercial for the 9.0-acre site to allow for the development of the Tennis Center will result in the reduction of approximately 130 low-density residential units from the designated land use based on the Development Plan allocations.

The reduction in low-density residential units will not severely affect the Resort's housing supply and is considered to be more than offset by the benefits of the Tennis Center in terms of improved recreational opportunities for the Resort's visitors and residents.

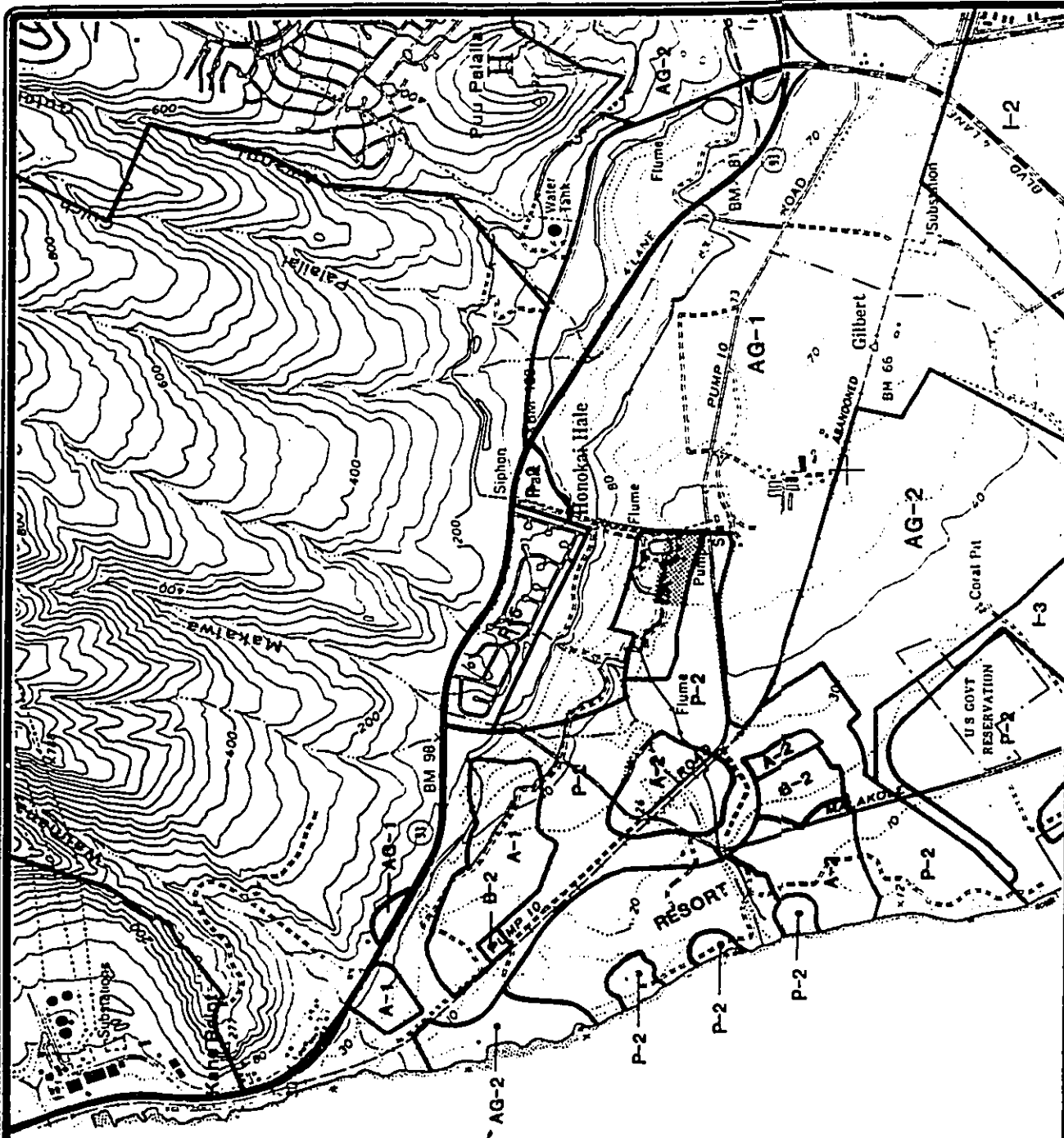
The Public Facilities Map for the Ewa Development Plan Area identifies public and private proposals for parks, streets and highways, major public buildings, utilities, terminals, and drainage. Within the immediate project area, a public school facility is indicated north of the site on the existing Facilities Map (See Figure 6). Privately-developed sewer and potable and non-potable water lines within the area are also indicated as planned on the existing Facilities Map.

E. EWA ZONING

The City and County of Honolulu Land Use Ordinance and accompanying maps define the allowable uses of land zoned for residential, apartment, business, resort, industrial, agricultural, preservation, and mixed uses. The current zoning for the project area is A-1 Low Density Apartment District (See Figure 7). The predominant permitted use in the A-1 Low Density Apartment District is low-density, multi-family dwellings, with other permitted uses which include uses and activities that complement apartment use, such as limited social services.

The Tennis Center is classified as an "outdoor recreational facility" and is not a permitted use in the A-1 district. Eating and drinking establishments as would be provided by the clubhouse facility are also prohibited by the present zoning. Upon amendment of the Development Plan, a zoning change would be required from A-1 Low Density Apartment District to B-2 Community Business District to enable the Tennis Center development. Requests for zoning changes are evaluated with respect to conformance with the Development Plan land use designations.

The project site is not located within the Special Management Area (SMA) boundaries established pursuant to Honolulu's SMA Ordinance and the State Coastal Zone Management Law.



LEGEND

- P - Preservation
- R - Residential
- A - Apartment
- B - Business
- I - Industrial
- AG - Agricultural
- Proposed A-1 to B-2



KO OLINA TENNIS CENTER
 Ko Olina Resort
 West Beach Estates

Fig. 7
 COUNTY ZONING

Prepared by:
 WILSON OKAMOTO & ASSOCIATES, INC.

V. EXISTING ENVIRONMENTAL AND ANTICIPATED IMPACTS

A. CLIMATE

The Ewa Plain receives high insolation year-round and modest amounts of rainfall, with an average annual precipitation of about 20 inches. Much of the total annual rainfall accumulates from several storms during the winter rainy season from October to April. The summer months are particularly hot and dry. The prevailing winds are tradewinds blowing from a northeasterly direction. Winds from a southeasterly direction (Kona winds) may be expected 5-8 percent of the time. The average annual temperature is 77 degrees Fahrenheit, ranging from 72 degrees in February to 79 degrees in July, August, and September.

B. GEOLOGY AND TOPOGRAPHY

The Ewa Plain is an emerged ancient coral-algae calcareous reef formed during the Pleistocene Period when the ocean level was at a higher elevation. The Plain is basically flat with a few isolated bluffs eroded by Honouliuli Stream. It is composed of calcareous material which has been modified, consolidated, and cemented by dissolution, rain, air and other chemical factors to form a hard but extremely permeable surface. Beneath the surface at approximately the 100-foot ground elevation, caprock comprised of terrestrial and marine sedimentary deposits forms a wedge that retards the seaward movement of fresh groundwater from the inland basaltic aquifer. At lower elevations the ground surface is made of alluvium, sedimentary deposits washed downslope over millennia.

The project site is within a region located at the foot of the Waianae Range, with slopes ranging from 1 percent to 3 percent.

C. SOILS

Soils in the project area generally belong to the Lualualei-Fill land-Ewa association, described as "deep", nearly level to moderately sloping, well-drained soils that have fine textured or moderately fine textured subsoil or underlying material, and areas of fill land on coastal plains." The association's soil series which is predominant at the project site is the Ewa (EmA) series, which is characterized by a surface layer of dark reddish-brown silty clay loam, subsoil of dark reddish-brown and dark red silty clay loam, and substratum of coral limestone, sand, or gravelly alluvium. It is moderately shallow and level to moderately sloping. Permeability is moderate, runoff is very slow, and the erosion hazard is no more than slight.

D. FLORA AND FAUNA

Flora. A botanical survey was undertaken for the Ko Olina area by Winona P. Char, botanical consultant, in June 1979. The vegetation in the general vicinity of the project area was found to be dominated by sugar cane and the exotic species identified as *Leucaena* (koa haole). Remnants of original native flora were found scattered throughout the area. The sparse species of vegetation in the area is attributed to the area's low rainfall, with degradation of the native flora resulting primarily from the culminated effects of the activities of man, including agriculture, ranching, and military activities. The mass grading of the land for the development of the Ko Olina Resort has resulted

in displacement of these vegetations. No endemic or rare and endangered species were found in the project area and no native ecosystems will be affected by the proposed project.

Fauna. The fauna in the general vicinity of the project area previously identified include feral dog, feral cat, house mice, brown rat, black rat, mongoose, commonly found bird species such as doves and finches, and two species of migratory shorebirds identified as the Golden Plover and the Wandering Tattler. The mass grading of the land for the Ko Olina Resort has extensively modified or displaced these wildlife. There are no rare or endangered species of wildlife currently inhabiting the site.

E. SCENIC AND VISUAL RESOURCES

Travelling along the H-1 freeway, Waianae bound, the open expanse of the Ewa Plain is predominant. Major view objects within the coastal viewplane include the Campbell Industrial Park, sugar cane fields, the Barbers Point Deep-Draft Harbor, and the Pacific Ocean. The proposed Tennis Center is planned to be located approximately a half mile makai of Farrington Highway. With a low profile design and heavy landscaping, the Tennis Center will not be readily visible from the highway.

F. HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Prior to mass grading of the entire Ko Olina Resort, an intensive archaeological survey and test excavations were conducted by Paul H. Rosendahl, Ph. D., Inc.. The project site has been extensively modified in recent times, primarily by sugar cane cultivation which involved extensive clearing and the grading operations for Ko Olina Resort.

No significant archaeological sites were encountered within the immediate project site during the survey. With the completion of this survey, no additional archaeological work is required.

G. NOISE

The proposed Tennis Center development is not expected to generate any long term noise impacts to nearby residential developments. Tennis courts compatibly exist in many residential communities and the sport does not involve or generate any significant levels of noise. Extensive landscaping within and along the perimeter of the site will help to buffer any noise, while only four of the standard courts will have lighting which should minimize any noise generated from evening play.

Major tennis tournaments staged at the 1,000-seat stadium court are expected to occur infrequently, perhaps one or two times a year. As a result, noise generated by the events will have short durations of noise impact on the surrounding planned residential developments.

The more heavily attended tournaments are most likely to be held during the daytime hours and on weekends. The future school site is approximately 1,000 feet from the stadium court and should not be affected by noise during the more sparsely attended times of weekday tournament play.

Noise generated by accompanying traffic in association with the events will occur for relatively short periods prior to and after the events and will not adversely affect the adjacent residential areas.

During construction, noise levels in the immediate vicinity of the project site will increase as a result of operating heavy vehicles and other power equipment. Short term construction impacts will be appropriately mitigated in compliance with the Department of Health Administration Rules covering noise impacts.

H. ACCESS AND TRAFFIC

Primary access to the Ko Olina Resort site is via the H-1 Freeway and Farrington Highway. West and east bound access to and from the project area is via the newly constructed Ko Olina Interchange and another at-grade crossing to Farrington Highway. The H-1 Freeway merges with Farrington Highway just west of the Palailai Interchange. From the access points, circulation through the project site will be provided by Road A, a loop road system consisting of a four-lane collector road within a 100-foot right-of-way. The collector road will branch off into a series of cul-de-sac roads, providing access to the development's resort, residential, commercial and recreation facilities.

The traffic generated by the Tennis Center will not adversely affect existing and planned roadways within the Ko Olina Resort development. A shuttle bus is planned to transport resort visitors and guests from the hotel and residential areas to the Tennis Center, and will assist in alleviating traffic in the area.

Based on a traffic study undertaken by Wilbur Smith Associates in December 1989, the proposed Tennis Center would generate 41 vehicle trips during the morning peak hour, and 76 trips during the evening peak hour (See Appendix).

At these levels, typical one day peak hour traffic to and from the Tennis Center would be relatively light, and traffic impacts would be virtually insignificant.

The peak hour analyses of the Tennis Center driveway and the main collector road indicate that the intersection would operate under capacity in both 1992 and 2005. However, traffic turning left from the driveway would experience very long delays unless there are signals at nearby intersections to platoon traffic and provide more gaps.

The Tennis Center driveway will provide for separate left and right turn lanes for exiting traffic. A stop sign should be used to control turns from the driveway. A left turn bay into the Tennis Center will also be provided for westbound traffic on the main collector road.

A major tennis tournament at the Tennis Center would generate a peak parking demand greater than could be accommodated in the Tennis Center parking lot. However, the design of the main collector road would allow adequate on-street parking without interfering with roadway operation. The planned school west of the Tennis Center could provide additional parking during non-school hours. Attendants will be made available to direct and control traffic into and out of the Tennis Center parking lot.

I. AIR QUALITY

The major contributors to air pollution currently are agricultural activities (dust and cane burning) and emissions from the Campbell Industrial Park refineries and plants. The recently completed H-POWER plant will contribute to further emissions. The anticipated decreases in cultivated sugar cane acreage resulting from the proposed future urban development of the Ewa area will offset the increased emissions expected from the resource recovery operations. The predominant wind pattern in the Ewa area carries emissions from these facilities offshore and away from the site, but occasional impacts are possible. Current emissions from the Campbell Industrial Park refineries and plants are in compliance with existing federal and state air quality standards (Root and Neal, 1989).

The other major contributor to the degradation of air quality is automotive vehicles which are the major source of carbon monoxide. It should be noted, however, that far more traffic would be generated by the 130 units of low density apartment which the proposed project replaces. Compared with the traffic which would have been generated by these residential units allowed under present zoning, operations of the Tennis Center will result in far less vehicular traffic and thus there should be far less air quality impacts.

J. SOCIO-ECONOMIC CONDITIONS

1. Population. Demographic characteristics of the Ewa district were extracted from the 1980 Census of Population. The Ewa Development Plan Area's population increased from 24,087 in 1970 to 36,234 in

1980 based on Census data. Growth within the planning region over this decade represented a 50 percent increase corresponding to an annual growth rate of 4.17 percent, well above the Oahu annual rate of 1.96 percent. Population within the Ewa region is expected to more than double to about 83,000 by the year 2005, with Ewa's share of Oahu's population growing from 4.5 percent to 8.7 percent. This represents a 125 percent increase over 1985 population levels, which corresponds to an annual 4.15 percent increase, versus a projected islandwide growth rate of 0.79 percent annually for the same period.

According to the 1980 Census, demographic characteristics of the present Ewa population indicate a relatively younger, possibly more transient group, with more high school but less college level graduates as compared with the islandwide population. The ethnic composition differs from the general population with more Caucasians, Filipinos, and Hawaiians and fewer Japanese and Chinese.

2. Employment. Labor force characteristics show a relatively high proportion of the labor force is employed in armed forces occupations. Pearl Harbor and Barbers Point employ 18 percent of the Ewa labor force compared with only 10 percent of the islandwide population. Unemployment levels in 1980 were almost double that of the general population (8.0 percent versus 4.6 percent). The Ewa labor force contains a higher proportion of blue collar workers (service, farm, precision, craft, repair, laborers) and less white-collar occupations (managerial/professional, technical, sales, and administrative) than the rest of

Oahu. Agricultural jobs are three times as high as the general population.

The Tennis Center is expected to generate long term employment of approximately 20 employees involved in maintaining and operating the clubhouse, restaurant, Pro-Shop, and tennis grounds.

3. Housing. According to 1984 estimates by the Department of General Planning, the Ewa Development Plan Area contained 9,300 housing units, or 3.5 percent of the total Oahu housing stock of 265,000 units. Existing residential communities in the Ewa area include: Makakilo (2,700 units), Ewa Beach (3,465 units), Ewa Villages (900 units), Honokai Hale/Nanakai Gardens (286 units), and Naval Air Station Barbers Point (850 military housing units).

Planned developments which would substantially increase the housing stock over the next 10 to 15 years include: Ko Olina Resort (5,200 units), the Makakilo area (2,500 units), the Ewa Villages area, also known as Ewa Gentry (7,150 units), Ewa Marina (4,850 units), Kapolei Village (4,871 units), and West Loch Estates (1,500 units).

The development of the Tennis Center on the site will result in the loss of developable low density residential apartment land. An estimated 130 units will be foregone by the developer because of the land area required for the Tennis Center. The implications of this development cost reallocation are deemed to be justified by the benefits received by providing the Tennis Center.

K. PUBLIC SERVICES AND FACILITIES

1. Water System. The "Ewa Water Master Plan" identifies the necessary source, transmission, and storage systems for potable and non-potable water supplies necessary to accommodate planned developments. As a conservation measure, the water master plan promotes the use of dual water systems wherever possible, using non-potable water for irrigation use. Mauka of the project site and Farrington Highway, construction is underway for water transmission mains, reservoirs, and non-potable wells for Ko Olina Resort. New potable water wells have been identified for development as part of the Water Master Plan at the 440-foot elevation of upper Honouliuli, north of H-1 Freeway and west of Kunia Road.

The proposed Tennis Center development will not create any additional demand on the water system. Compared with the water usage which would have been generated by the residential units allowed under present zoning, operations and activities of the Tennis Center will result in less water demand.

2. Wastewater System. On the mauka side of the railroad right-of-way, 33- and 36-inch trunk sewers connect to the municipal Makakilo Interceptor Sewer which conveys and discharges wastewater to the Honouliuli Wastewater Treatment Plant. Once treated, the effluent is discharged by deep outfall off of the Ewa Coast. The existing lines are adequate to accommodate the wastewater generated by the planned Tennis Center.

3. Solid Waste Disposal. The project area will be serviced by the City and County of Honolulu Division of Refuse and by private refuse collection companies. Collected solid waste will then be transported to the H-POWER facility or to a public landfill site.

The proposed Tennis Center development will not create any additional impact on the solid waste disposal.

4. Drainage System. The project area is designated as Zone D or "area of undetermined by possible flood hazard" according to maps prepared by the Federal Insurance Administration for Oahu. Runoff discharges onto the Ewa Plain but is readily absorbed by the porous coral substrate so that much of the discharge never reaches the ocean. The Ko Olina Resort development is located below several well-defined drainage basins with stormwater carried seaward in lined and unlined channels and culverts.

The proposed Tennis Center development will not create any additional impact on the drainage system.

5. Electrical and Telephone System. The Hawaiian Electric Company (HECO) generates electric power from its Kahe and Waiiau generating stations for the general Ko Olina Resort area. An electrical substation is planned within the Ko Olina Resort to service the area.

The Hawaiian Telephone Company provides local residential and business telecommunication services to existing communities. The American Satellite Company has recently constructed a satellite communications

station at the base of Puu Palailai. AT&T maintains an underground optical cable which runs along Farrington Highway. A telecommunication switching station planned for installation within the resort will provide telephone service to the area.

The proposed Tennis Center development will not create any additional demands on the electrical and telephone systems.

6. Police and Fire Protection. Police service to the Ewa area is provided by the Pearl City station, which jurisdiction includes three districts: the Waianae Coast, Waipahu/Ewa Beach, and Aiea/Pearl City.

Fire service to the proposed development site is presently provided from the Makakilo station, which houses an engine company and five firefighters. Additional City Fire Department units are available from the Waipahu and Nanakuli stations. The Ewa Development Plan Public Facilities Map designates a fire station to be included within the Ko Olina Resort.

The proposed Tennis Center development will not create any additional demand for police and fire protection.

References

- City and County of Honolulu, Department of General Planning. Development Plan Common Provisions.
- _____. Development Plan Special Provisions for Ewa.
- _____. General Plan, Objectives and Policies. 1988.
- Environmental Communications, Inc. Final Supplemental Environmental Impact Statement for West Beach, Honouliuli, Ewa District, Island of Oahu, Hawaii. June, 1985.
- Helber, Hastert and Kimura, Planners. Ewa Long Range Master Plan. Prepared for the Estate of James Campbell. May, 1988.
- _____. Final Environmental Impact Statement for the Kapolei Town Center. Prepared for The Estate of James Campbell. August, 1988.
- Paul H. Rosendahl, Ph.D., Inc. Interim Report: Phase 2 - Intensive Survey and Test Excavations West Beach Data Recovery Program. Prepared for KG Hawaii Construction. July 1987.
- Root & Neal Air Pollution Consulting. Air Quality Study for the Proposed Ko Olina Phase II, Ewa, Oahu, Hawaii. Prepared for West Beach Estates. January, 1989.
- State of Hawaii, Department of Land and Natural Resources. State Recreational Functional Plan. June, 1984.
- State of Hawaii, Department of Planning and Economic Development. State Tourism Functional Plan. June, 1984.
- _____. The Hawaii State Plan Revised. 1988.
- Wilson Okamoto and Associates, Inc. Application for Development Plan Amendment and Environmental Assessment, Ko Olina Resort Phase II. Prepared for West Beach Estates. November, 1988.
- _____. Final Environmental Impact Statement for Ko Olina Phase II. Prepared for West Beach Estates. April 1989.

APPENDIX

Traffic Impact Study

WILBUR
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ENGINEERS • PLANNERS

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December 21, 1989

Mr. Gary Okamoto
Vice-President
Wilson Okamoto & Associates
1150 South King Street, Suite 800
Honolulu, HI 96814

Dear Mr. Okamoto:

Wilbur Smith Associates (WSA) is pleased to submit this traffic impact study for the proposed Ko Olina Resort Tennis Center. This report covers the following topics:

- o a brief description of proposed development,
- o tennis center trip generation characteristics,
- o tennis center traffic impacts for a typical weekday,
- o tournament traffic impacts, and
- o conclusions and recommendations.

Ko Olina Resort Tennis Center - The proposed development will be located makai of Ko Olina Parkway between Kalaeloa Boulevard and the Ko Olina Connector Road. The tennis center will include approximately ten tennis courts in 1992 and twenty by 2005. One or more of these courts will be located in a 1,000 seat stadium. The tennis center will also include a club house containing the following facilities:

- o pro shop (2,000 square feet),
- o lockers, showers and restrooms (2,000 square feet),
- o restaurant (2,000 square feet).

Tennis Center memberships will be sold to resort residents and non-residents for tennis and/or social activities. The tennis center will have a parking lot with 50 spaces available.

Tennis Center Trip Generation Characteristics - On a typical weekday, there would be three types of vehicle trips to and from the tennis center: tennis court users, club house

users and employees. Several assumptions were made regarding the trip generation characteristics associated with these types of trips:

- o The tennis courts were assumed to be fully used during the morning and afternoon peak hours. Fifty percent of the courts would have two players each and the other fifty percent would have four players each. The vehicle occupancy rate for tennis court users was assumed to be 1.5 person per vehicle since tennis games are group activities.
- o The restaurant and pro shop would also be visited by members who are not at the tennis center to use the courts. It was assumed that during the morning peak hour, ten percent of the restaurant seating would be occupied by such users. During the afternoon peak hour (4:00-5:00 pm) only thirty percent of the restaurant/bar seating is assumed to be used. Of this percentage, only thirty percent would not be at the tennis center already.
- o Since the majority of the employees would need to be on the premises before the tennis center opens, a conservative twenty-five percent was assumed to arrive during the AM peak hour. Due to uncertainty regarding the planned shift changes, twenty-five percent were also assumed to arrive and depart during the PM peak hour. The assumed number of employees arriving during the AM peak hour in 1992 and 2005 is one for the tennis courts, one for the restaurant, one for the pro shop, and one for the club house. The assumed number of employees arriving during the PM peak hour in 1992 and 2005 is one for the tennis courts, two for the restaurant, and three for the club house. The vehicle occupancy rate for employees was conservatively assumed to be one person per vehicle.

Table 1 and 2 summarizes the tennis center vehicle trips that would result from these AM and PM peak hour trip generation assumptions for 1992 and 2005, respectively.

Table 1
Ko Olina Resort Tennis Center
1992 Vehicle Trips

	AM Peak Hour		PM Peak Hour	
	<u>IN</u>	<u>OUT</u>	<u>IN</u>	<u>OUT</u>
Tennis Players	20	6	20	20
Tennis Center Visitors	9	2	15	10
Tennis Center Employees	4	0	6	5
Total Tennis Center	33	8	41	35

Table 2
Ko Olina Resort Tennis Center
2005 Vehicle Trips

	AM Peak Hour		PM Peak Hour	
	IN	OUT	IN	OUT
Tennis Players	40	12	40	40
Tennis Center Visitors	12	2	22	14
Tennis Center Employees	4	0	6	5
Total Tennis Center	56	14	68	59

Project Traffic - The distribution of the vehicle trips to the tennis center was assumed to be sixty percent from the west (the Ko Olina resort area) and forty percent from the east (from Kalaeloa Boulevard and Ko Olina Parkway intersection). Most of the vehicles would be coming from the west since most of the memberships would be resort residents.

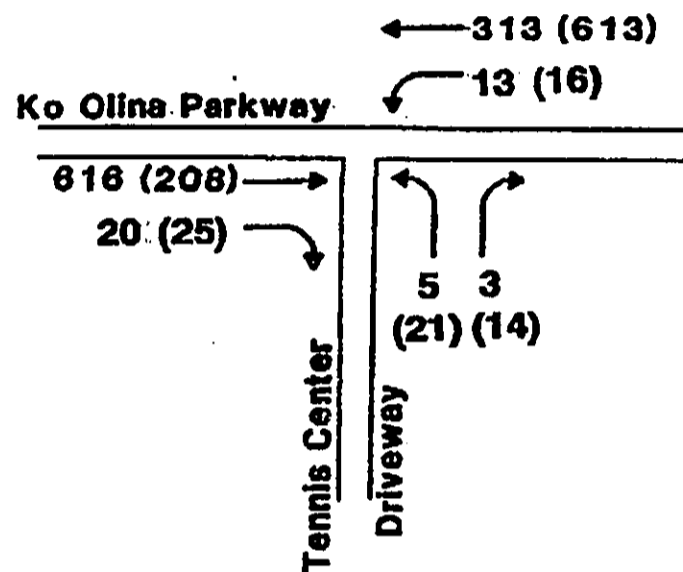
Figure 1 and 2 show AM and PM peak hour project traffic for the proposed Ko Olina Resort Tennis Center for 1992 and 2005, respectively. The project traffic changes some between 1992 and 2005 because by the year 2005 ten more tennis court would be added.

In 1992, as depicted in Figure 1, 33 total vehicles would enter the tennis center and 8 would leave the center during the AM peak hour. Twenty vehicles arrive from the west (Ko Olina Resort area) and thirteen arrive from the east (from Kalaeloa Boulevard and Ko Olina Parkway intersection). The same percentages (sixty to the west and forty to the east) are reflected for the 8 vehicles leaving the center during the AM peak hour in 1992.

During the PM peak hour, 41 vehicles would enter the tennis center, and 35 would leave. Again, sixty percent of the 41 vehicles (25) enter from the west (Ko Olina Resort area) and forty percent (16 vehicles) enter from the east (from Kalaeloa Boulevard and Ko Olina Parkway intersection). The same percentages (sixty to the west and forty to the east) are assumed for the 35 vehicles leaving the center in the PM peak hour.

In 2005, as depicted in Figures 2, 56 total vehicles would enter the tennis center and 14 would leave the center during the AM peak hour. Thirty-four vehicles arrive from the west (Ko Olina Resort area) and twenty-two arrive from the east (from Kalaeloa Boulevard and Ko Olina Parkway intersection). The same percentages (sixty to the west and forty to the east) are reflected for the 14 vehicles leaving the center during the AM peak hour in 2005.

Ko Olina Resort Tennis Center 1992 Traffic Volumes



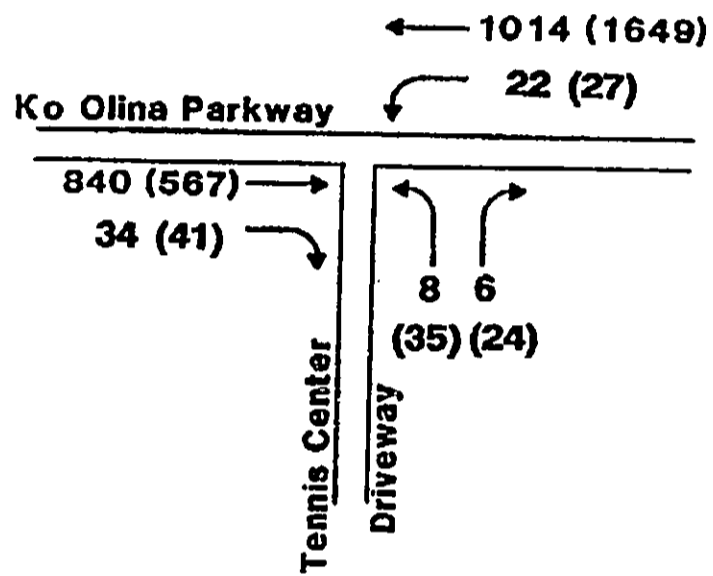
Legend:

313 AM Peak Hour Traffic Volume
(613) PM Peak Hour Traffic Volume

Wilbur Smith Associates

Figure 1

Ko Olina Resort Tennis Center 2005 Traffic Volumes



Legend:

313 AM Peak Hour Traffic Volume
(613) PM Peak Hour Traffic Volume

Wilbur Smith Associates

Figure 2

During the PM peak hour, 68 vehicles would enter the tennis center, and 59 would leave. Again, sixty percent of the 68 vehicles (41) enter from the west (Ko Olina Resort area) and forty percent (27 vehicles) enter from the east (from Kalaeloa Boulevard and Ko Olina Parkway intersection). The same percentages (sixty to the west and forty to the east) are assumed for the 59 vehicles leaving the center in the PM peak hour.

Figure 1 also shows 1992 through (non-project related) traffic on Ko Olina Parkway, while Figure 2 shows 2005 through (non-project related) traffic on Ko Olina Parkway. The through peak hour traffic ranges from approximately 900 vehicles in 1992 to about 2,000 vehicles in 2005. The through traffic volumes on Ko Olina Parkway at the tennis center entrance were developed by Wilbur Smith Associates for earlier studies of the Ko Olina II area. The 2005 background traffic forecast was based, in part, on the regional Hali 2005 traffic forecast.

The Highway Capacity Manual (HCM) methodology for unsignalized intersection capacity analysis was used to assess operating conditions at the Ko Olina Resort Tennis Center Driveway and Ko Olina Parkway intersection. The tennis center driveway and Ko Olina Parkway intersection would have stop sign control on the tennis center driveway. This forces drivers on the tennis center driveway to judgmentally select gaps in the major street (Ko Olina Parkway) flow through which to execute crossing or turning maneuvers. The capacity of the intersection movements is based on two factors: (1) the distribution of gaps in the major street traffic stream, and (2) driver judgment in selecting gaps through which to execute their desired maneuvers. It is important to remember that the wide median on Ko Olina Parkway would improve gap selection and timing for these movements.

In analyzing intersection capacity, the tennis center exit was assumed to have a right-turn lane and a left-turn lane. Ko Olina Parkway is planned as a four-lane divided roadway. A left-turn lane from westbound Ko Olina Parkway to the tennis center driveway was assumed.

Appendices A and B present the detailed capacity calculations for 1992 and 2005, respectively. Table 2 summarizes the results of the unsignalized capacity analyses at the tennis center driveway intersection for years 1992 and 2005:

- o In 1992, all movements except the left turn from the tennis center driveway to Ko Olina Parkway would operate at level of service A (no delays) during the AM and PM peak hours.
- o The left turn from the tennis center driveway to Ko Olina Parkway would operate at level of service D during the AM peak hour and C during the PM peak hour, indicating noticeable but acceptable delays. The actual operating conditions would

probably be better than D because HCM methodology does not take into account the very wide median planned for Ko Olina Parkway.

- o In 2005, the left turn from the tennis center driveway to Ko Olina Parkway would operate at level of service E indicating long delays for the left turn traffic. The lower level of service would be due to increased through traffic on Ko Olina Parkway and the resulting reduction in the number of gaps through which left turn traffic could pass.

Table 3
Unsignalized Capacity Analysis
Tennis Center Driveway and Ko Olina Parkway

	1992		2005	
	Level of Service		Level of Service	
	<u>AM</u>	<u>PM</u>	<u>AM</u>	<u>PM</u>
Tennis Center Driveway				
Northbound Left	D	C	E	E
Northbound Right	A	A	A	A
Ko Olina Parkway				
Westbound Left	A	A	B	A

Tournament Traffic - The primary issue associated with a tennis tournament at the Ko Olina Resort Tennis Center is parking. For a tennis tournament, it was assumed that ninety percent of the 1,000 seat stadium would be occupied. Two additional assumptions were made about the way spectators would arrive: (1) twenty percent of the spectators would walk or use a resort shuttle bus; and (2) eighty percent of the spectators would arrive in cars having an average vehicle occupancy of 2.5 persons. To be conservative, an additional 100 vehicle trips were added to cover the employees and others involved in the tournament management activities. These assumptions indicate a maximum need for approximately 420 parking spaces.

Preliminary plans for the proposed Ko Olina Resort Tennis Center show about 50 parking spaces in the tennis center parking lot. Consequently, 390 vehicles would park on streets adjacent to the tennis center. Ko Olina Parkway will be a four-lane private road. It has been designed using the Typical Public Road A standard. This standard calls for thirty two feet of pavement on each side of a 16 feet median. Stripped for two lanes in each direction, the planned roadway width is sufficient to permit parking along the outside curbs. The street would still function as a four-lane roadway even with vehicles parked along the outside curbs. A planned school on Ko Olina Parkway, west of the tennis center, could provide additional tournament parking during non-schools hours.

The on-street parking on Ko Olina Parkway would, however, create a demand for U-turns and would generate some pedestrian activity. Both of these factors should be considered in designing the median for Ko Olina Parkway. In addition, it would probably be necessary to have someone directing and controlling traffic into and out of the tennis center parking lot.

Conclusions and Recommendations - Typical day peak hour traffic to and from the Ko Olina Resort Tennis Center would be relatively light, and the traffic impacts would be virtually insignificant:

- o The tennis center driveway should have separate left and right turn lanes for exiting traffic. A stop sign should be used to control turns from the driveway. A left turn bay into the tennis center should be provided for westbound Ko Olina Parkway traffic.
- o The peak hour analyses of the Ko Olina Resort Tennis Center Driveway and Ko Olina Parkway intersection indicate the intersection would operate under capacity in both 1992 and 2005. However, traffic turning left from the driveway would experience very long delays unless there are signals at nearby intersections to platoon traffic and provide more gaps.

A major tennis tournament at the Ko Olina Resort Tennis Center would generate a peak parking demand greater than could be accommodated in the tennis center parking lot. However, the design of Ko Olina Parkway would allow adequate on-street parking without interfering with roadway operation. The planned school west of the tennis center could provide additional parking during non-school hours. It would probably be necessary to have someone directing and controlling traffic into and out of the tennis center parking lot.

Please telephone me at 949-7334 if you require any additional information.

Sincerely yours,
Wilbur Smith Associates

Bryant T. Brothers

Bryant T. Brothers
Associate