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Solid Waste Division
BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

December 8, 1993

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

Gentlemen:

SUBJECT: Road "F"/Kamaole Heights (TMK:3-9-18:por. 17, 3-9-19:por. 6, and 3-9-20:por., 20, por. 27)

In accordance with the requirements of Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, a Final Environmental Assessment (EA) has been prepared for the subject project.

Notice of availability of the Draft EA for the project was published in the November 8, 1993 OEQC Bulletin. One comment letter was received and our response has been included in the Final EA.

We would like to note that the tax map parcels for the project were inadvertently listed incorrectly in the Draft EA documentation. However, the written description and figures were correct in depicting the project. In the publication of the Final EA, we would like to request that a notation be made that the correct tax map parcels are as noted above.

As the proposing agency, we are forwarding herewith one copy of the OEQC Bulletin Publication Form, and four copies of the Final EA. We have determined that there will be no significant impacts as a result of the project and, therefore, are filing the Final EA as a negative declaration. We respectfully request that the notice of Final EA be published in the OEQC Bulletin.

Very truly yours

for GEORGE N. KAYA
Director of Public Works

CY/JK:jc(ED93-1273)
FEARDF.KAM

210

1993-12-23-MA-FEA-Kamaole Heights/Road "F"

Final Environmental Assessment

Road "F"/Kamaole Heights

Prepared for:

KOAHE Limited Partnership

December 1993

Michael T. Munekiyo Consulting, Inc.

Final
Environmental Assessment

Road "F"/Kamaole Heights

Prepared for:

KOAHE Limited Partnership

December 1993

Michael T. Munekiyo Consulting, Inc.

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dowling.fea.oc11

Preface

KOAHE Limited Partnership proposes to construct Road "F" in conjunction with a 62-lot residential subdivision, and a 24 stall parking lot in Kihei, Maui, Hawaii (TMK 3-9-18:por. 17, 3-9-19:por. 6, and 3-9-20:por. 20, por. 27). Because the new Road "F" will affect State and County rights-of-way, an Environmental Assessment is being prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, Environmental Impact Statement Rules. The Environmental Assessment documents the project's technical characteristics and environmental impacts, and advances findings and conclusions relative to the significance of the project.

Summary

Applicant and Landowner

The Applicant for the project is KOAHE Limited Partnership. Landowners involved in the project are the State of Hawaii, County of Maui, and KOAHE Limited Partnership.

Contact Person

For further information, contact Everett Dowling, Dowling Company, Inc., 1997 East Main Street, Wailuku, Hawaii 96793.

Property Location and Description

The subject project involves construction of a new Road "F" extending from South Kihei Road to Piilani Highway, a 62-lot residential subdivision, a segment of the North-South Collector Road adjacent to the project area and a public parking lot in Kihei, Maui, Hawaii. The project site is located in the Kamaole area of the district lying mauka of Kamaole Beach Park I. The property is currently undeveloped and is predominantly vegetated with buffel grass and kiawe trees.

KOAHE Limited Partnership proposes to construct Kamaole Heights, a zero lot line residential subdivision in Kihei, Maui, Hawaii (TMK 3-9-19:por. 6). The subdivision site is 11.256 acres in size and would contain 62 lots. To provide vehicular access to the project site, the project will also entail construction of Road "F", extending from South Kihei Road to Piilani Highway. Other project elements include an adjacent segment of the North-South Collector Road as well as a 24 stall parking lot intended to supplement beach parking for Kamaole Beach Park I. The parking lot is in excess of County park assessment requirements.

The proposed Road "F" will abut the north boundary of the Kamaole Heights Subdivision. A 40 foot right-of-way with 2 travel lanes, one in each direction, is proposed for the area abutting the subdivision.

An 80 foot right-of-way is provided for Road "F" in the vicinity of its intersections with Kanakanui Road and Piilani Highway. The intersection of Road "F" and Kanakanui Road forms the northeast boundary of the proposed second Kihei Elementary School. On the Road "F" approach to Kanakanui Road travelling mauka, there are two travel lanes in each direction and a separate left turn lane. On Kanakanui Road, the project also involves the construction of a left turn storage lane on the southbound as well as the northbound approach. On Road "F", between Kanakanui Road and Piilani Highway, there are a left turn lane and a right turn lane on the mauka approach. The right turn lane then becomes a southbound merge lane on Piilani Highway. On the makai approach, there is a right/through lane, a through lane, and a left turn lane. The project also involves the construction of a deceleration lane which is proposed on Piilani Highway on its southbound approach to the intersection.

Makai of the Kamaole Heights Subdivision, Road "F" would be comprised of two travel lanes within a 40 foot right-of-way, one lane in each direction. The project entails the construction of two lanes for Road "F" which would extend approximately 800 feet in a makai direction from the residential subdivision. The intent, however, is to dedicate an ultimate 80 foot right-of-way to the County of Maui to allow provision of a four lane typical section if warranted by future traffic demand.

A 24 stall beach parking lot is proposed abutting Road "F" approximately 300 feet mauka of South Kihei Road. This parking lot is intended to provide additional beach parking for the Kamaole Beach Park I.

From the parking lot to South Kihei Road, the project entails the construction of Road "F" within an 80 foot right-of-way. There is a left turn lane into the parking lot. At the makai approach to the intersection of Road "F" and South Kihei Road, there are separate left and right turn lanes. There is also a through lane which connects with the existing parking lot at Kamaole Beach Park I. Travelling mauka from the South Kihei Road intersection, there are two lanes which merge into one mauka bound travel lane.

On South Kihei Road, there is a right turn deceleration lane onto Road "F". From Road "F", there is a right turn merge lane to South Kihei Road. Finally the project entails left turn storage lanes from South Kihei Road to Road "F" and the Kamaole Beach Park I parking lot.

The Road "F" improvements are proposed in connection with the new Kamaole Heights Subdivision. Kamaole Heights is proposed to occupy the makai portion of lands designated as TMK 3-9-19:por. 6. The mauka portion of this parcel totalling 12 acres is proposed as the second Kihei Elementary School site.

Kamaole Heights contains lots ranging in area from 5,500 square feet to 7,444 square feet. It is anticipated that dwellings would be constructed under the R-0 zero lot line overlay provisions noted in Chapter 19.84 of the Maui County Code. This allows housing which has the attributes of detached single family dwellings but which allows placement of dwellings against one of the property lines, permitting the outdoor space to be grouped and utilized to its maximum benefit.

Depending on market conditions, the project may entail the sale of improved lots to individual owner-builders or the sale of house and lot packages. Projected sales prices for the lots are approximately $120,000.00. Should the project involve the sale of improved lots, it is anticipated that covenants would guide the construction of zero lot line homes within the subdivision.

Typical zero lot line homes for the house and lot package include two-bedroom two-bath models as well as three-bedroom two-bath models. Interior living area could range from approximately 970 square feet to 1,450 square feet. Should house and lot packages be sold, sales prices are anticipated to be in the range of $225,000.00 to $260,000.00.

Depending on market conditions, the project may involve the construction of a recreation center intended for residents of the Subdivision which could include a deck, swimming pool and restroom facilities. Should a recreation center be included in the project, it would occupy one of the lots in the 62 lot subdivision.

The project also involves the construction and dedication of one-half of the right-of-way for the future North-South Collector Road for the area makai of the Kamaole Heights Subdivision. A 30 foot wide right-of-way would be dedicated to the County for the Kamaole Heights Subdivision parcel (TMK 3-9-19:por. 6).

Construction of Road "F" will affect State and County rights-of-way. These are the circumstances which prompt the environmental review process. In addition, all improvements described above fall within the County's Special Management Area. A major permit application is required to be filed with the County Planning Department for consideration by the Maui Planning Commission.

Assuming all applicable permits are obtained, construction of the project may begin in September 1994 and be completed in August 1995. Estimated costs of Road "F", the North-South Collector Road segment and other off-site improvements are $3.75 million. The costs of the Kamaole Heights Subdivision into improved lots are $2.25 million. Should the project involve the sale of house and lot packages, costs for the homes and recreational center would be approximately $6.8 million.

Findings

The proposed project will involve earthwork and building construction activities. In the short term, these activities may create temporary nuisances normally associated with construction activities. However, dust control measures, such as regular watering and sprinkling, will be implemented to minimize wind-blown emissions. All construction activities are anticipated to be limited to normal daylight working hours. A solid waste management plan will be formulated for the disposal of clearing and grubbing material

from the site during construction. Impacts generated from construction activities are not considered adverse.

From a long term perspective, the proposed project is not anticipated to result in adverse environmental impacts. A botanical survey for the project found two (2) 'ohai plants on property adjacent to the proposed project. These are considered a Category 1 candidate endangered species which means that there is enough information on biological vulnerability and threats to support a proposal to list it as an endangered or threatened species. Seeds from the 'ohai have been collected and will be distributed to various botanic gardens and arboreta. The use of 'ohai as part of the landscaping plan within the Kamaole Heights Subdivision will also be considered. There are no known significant habitats of rare, endangered or threatened species of fauna or avifauna located on the project site.

The project will also involve the preservation in place of a small fishing shrine. Applicable requirements will be coordinated with the Historic Preservation Division of the Department of Land and Natural Resources. Medical, police, and fire protection services are not expected to be adversely impacted by the project. The project will provide a 24 stall public parking lot approximately 300 feet mauka of South Kihei Road. This is intended to be supplemental parking for beach goers at Kamaole Beach Park I. These improvements will significantly exceed the County's park assessment provisions resulting in park assessment credits. The landowner for the project, KOAHE Limited Partnership, is currently negotiating with the State of Hawaii on the State's possible purchase of an abutting 12 acre property for a second elementary school in Kihei. This should have significant beneficial impacts upon elementary school education in the region.

Regarding traffic, the implementation of Road "F" should be beneficial on a project specific basis as well as from a regional perspective. However, further detailed study is required during the design stage of development to address specific roadway

geometric requirements. Abutting segments of the North-South Collector Road are being proposed for dedication to the County of Maui. An 8-inch waterline is being extended approximately 2,500 feet from Alaku Road to provide water service to the project. A new 8-inch sewer line is also proposed to link up with the existing County line along South Kihei Road. The proposed drainage plan will consist of an underground drainage collection system, swales and retention/detention basins. Erosion control measures will be incorporated during construction to minimize soil loss. Grading and drainage plans are designed to produce no adverse effects by storm runoff to adjacent properties.

In light of the foregoing findings, it is concluded that the proposed action will not result in any significant impacts.

Chapter I

Project Overview

I. PROJECT OVERVIEW

A. PROPERTY LOCATION AND LAND OWNERSHIP

The subject project involves construction of a new Road "F" extending from South Kihei Road to Piilani Highway, a 62-lot residential subdivision, a segment of the North South Collector Road adjacent to the project area, and a public parking lot in Kihei, Maui, Hawaii. See Figure 1. The project site is located in the Kamaole area of the district lying mauka of Kamaole Beach Park I. The property is currently undeveloped and is predominantly vegetated with buffel grass and kiawe trees.

The applicant is KOAHE Limited Partnership. The lands involved in the project are owned by the State of Hawaii, County of Maui, and KOAHE Limited Partnership.

B. PROPOSED ACTION

KOAHE Limited Partnership proposes to construct Kamaole Heights, a zero lot line residential subdivision in Kihei, Maui, Hawaii (TMK 3-9-19:por. 6). See Figure 2. The site is 11.256 acres in size and would contain 62 lots. To provide for vehicular access to the project site, the project will also entail construction of Road "F", extending from South Kihei Road to Piilani Highway. Other project elements include an adjacent segment of the North-South Collector Road as well as a 24 stall parking lot intended as supplemental beach parking for the Kamaole Beach Park I. The parking lot is in excess of County park assessment requirements.

The proposed Road "F" will abut the north boundary of the Kamaole Heights Subdivision. An initial 40 foot right-of-way with 2 travel lanes, one in each direction, is proposed for the area abutting the subdivision.

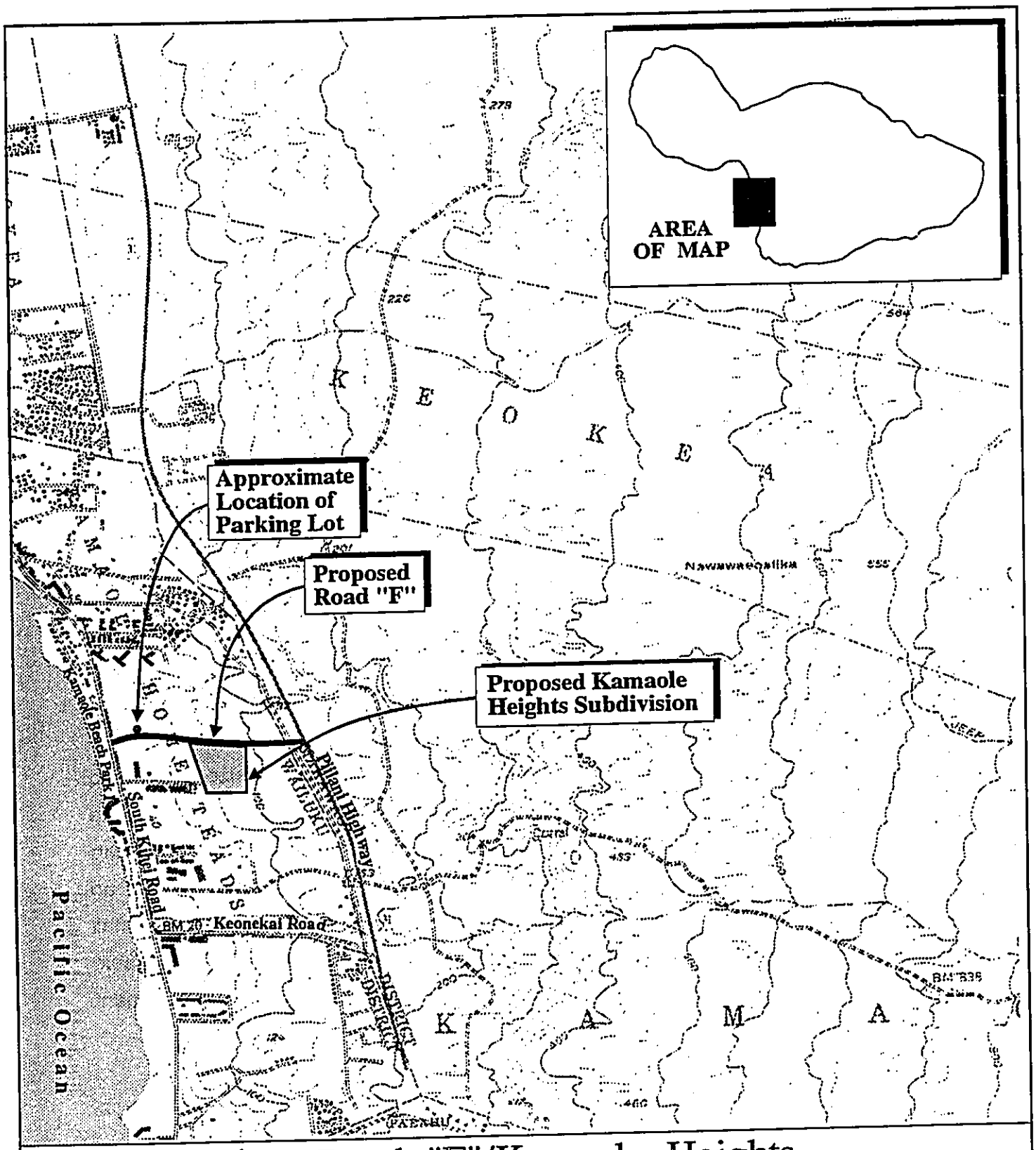
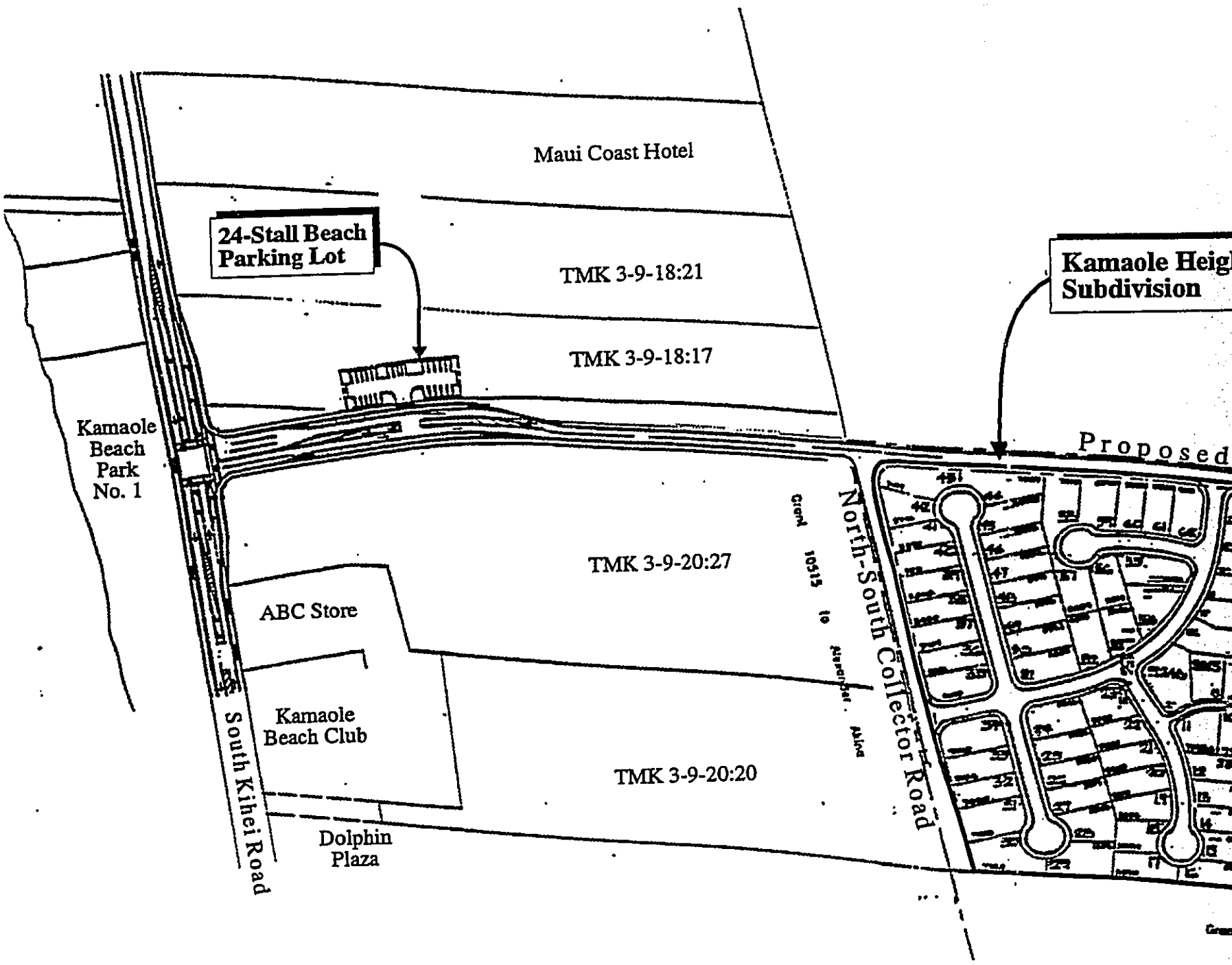


Figure 1 Road "F"/Kamaole Heights
Regional Location Map

0 1000 2000 4000 Feet

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

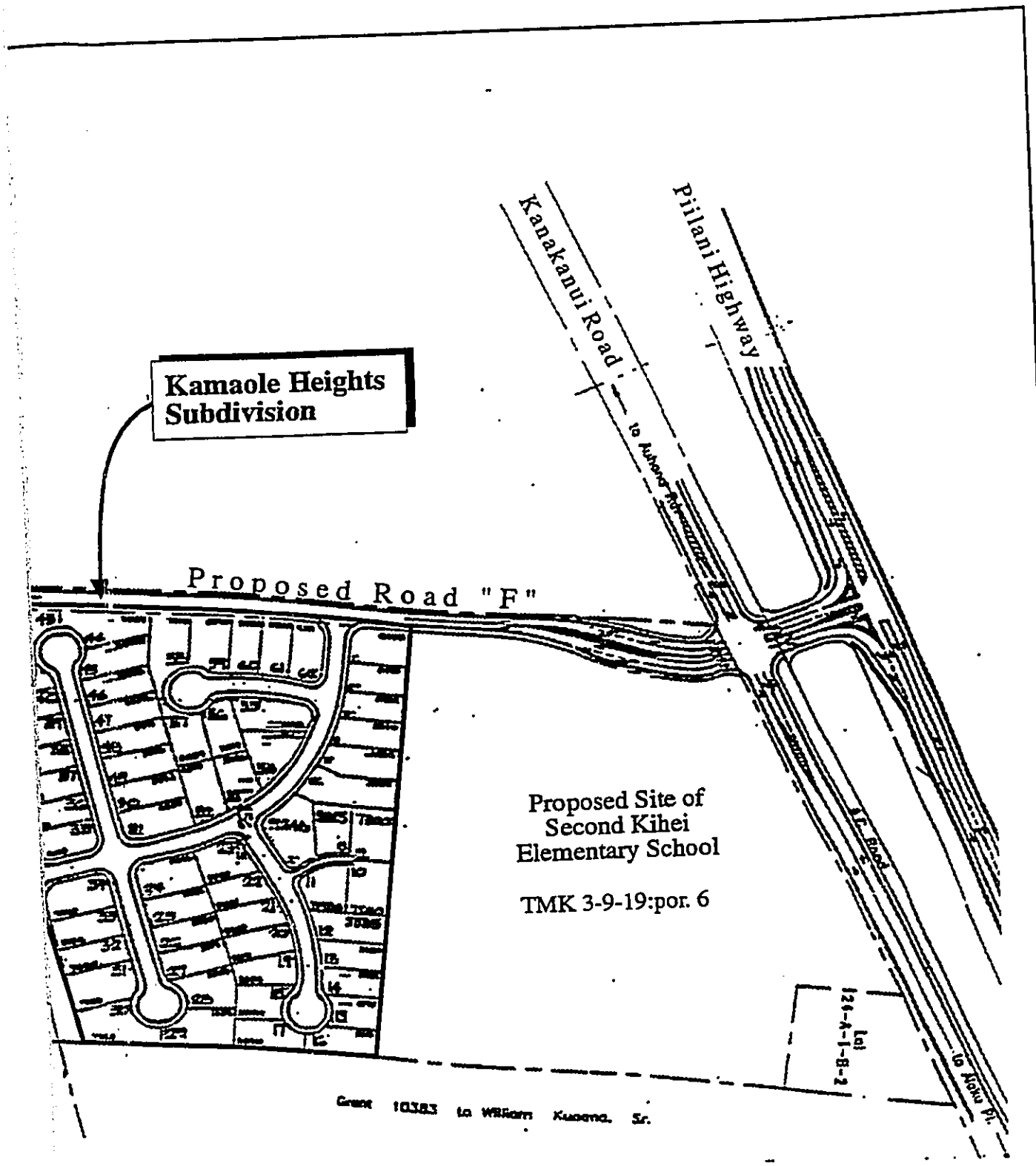


Source: Austin, Tsutsumi & Associates, Inc.

Figure 2

Road "F"/ Kamaole Heights
Project Location Map

NOT TO SCALE



umaole Heights
ocation Map

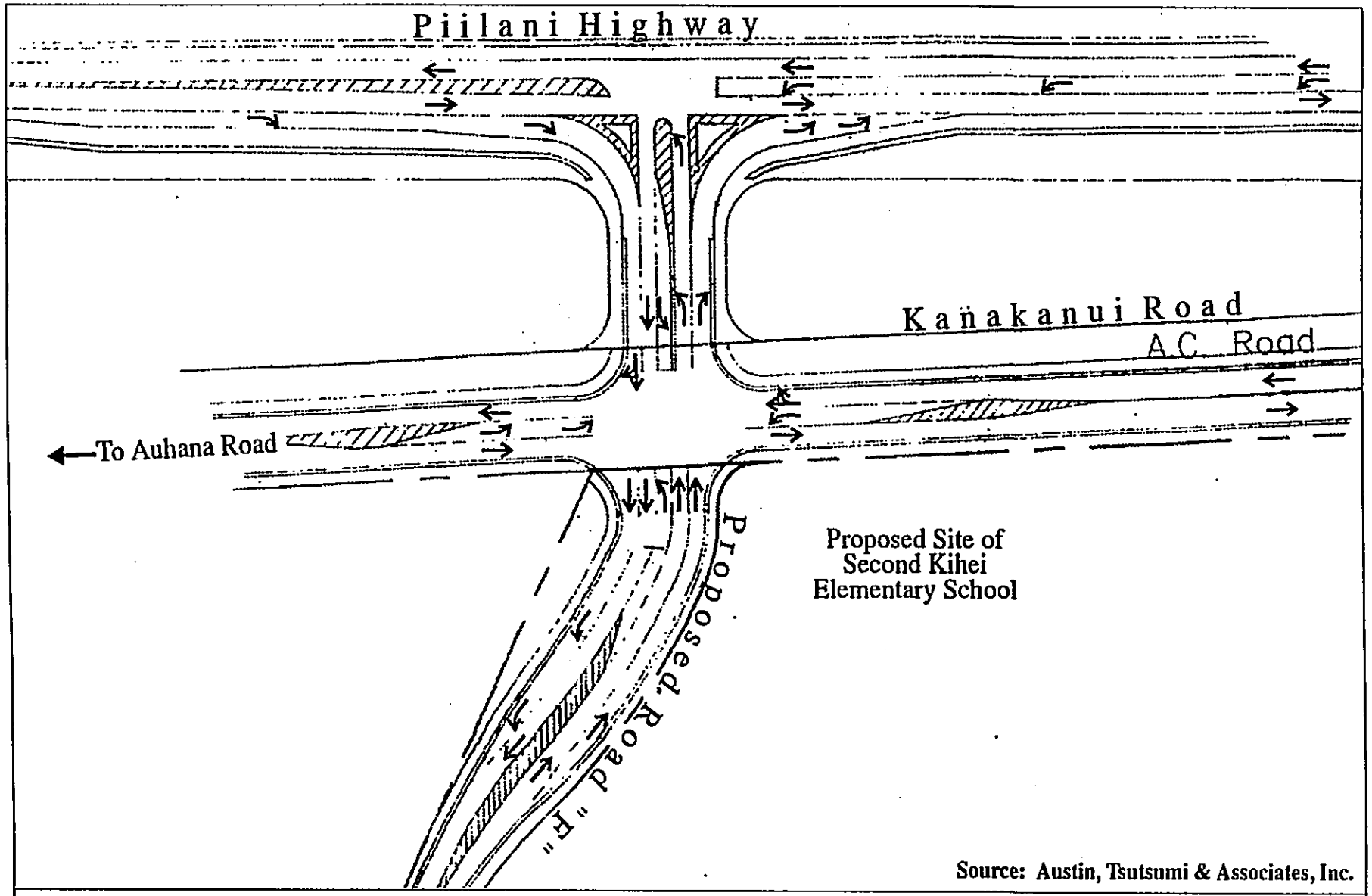
Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

To anticipate the future construction of the second Kihei Elementary School, an 80 foot right-of-way is provided for Road "F" in the vicinity of its intersection with Kanakanui Road and Piilani Highway. See Figure 3. On the Road "F" approach to Kanakanui Road travelling mauka, there are two travel lanes in each direction and a separate left turn lane. On Kanakanui Road, the project also involves the construction of a left turn storage lane on the southbound as well as the northbound approach. On Road "F", between Kanakanui Road and Piilani Highway, there are a left turn lane and a right turn lane on the mauka approach. The right turn lane then becomes a southbound merge lane on Piilani Highway. On the makai approach, there is a right/through lane, a through lane, and a left turn lane. The project also involves the construction of a deceleration lane which is proposed on Piilani Highway on its southbound approach to the intersection.

Makai of the Kamaole Heights Subdivision, Road "F" would be comprised of two travel lanes within a 40 foot right-of-way, one lane in each direction. The project entails the construction of two lanes for Road "F" which would extend approximately 800 feet in a makai direction from the residential subdivision. The intent, however, is to dedicate an ultimate 80 foot right-of-way to the County of Maui to allow provision of a four lane typical section if warranted by future traffic demand.

A 24 stall beach parking lot is proposed abutting Road "F" approximately 300 feet mauka of South Kihei Road. This parking lot is intended as additional beach parking for the Kamaole Beach Park I. See Figure 4.

From the parking lot to South Kihei Road, the project entails the construction of Road "F" within an 80 foot right-of-way. There is a left turn lane into the parking lot. At the makai approach to the intersection



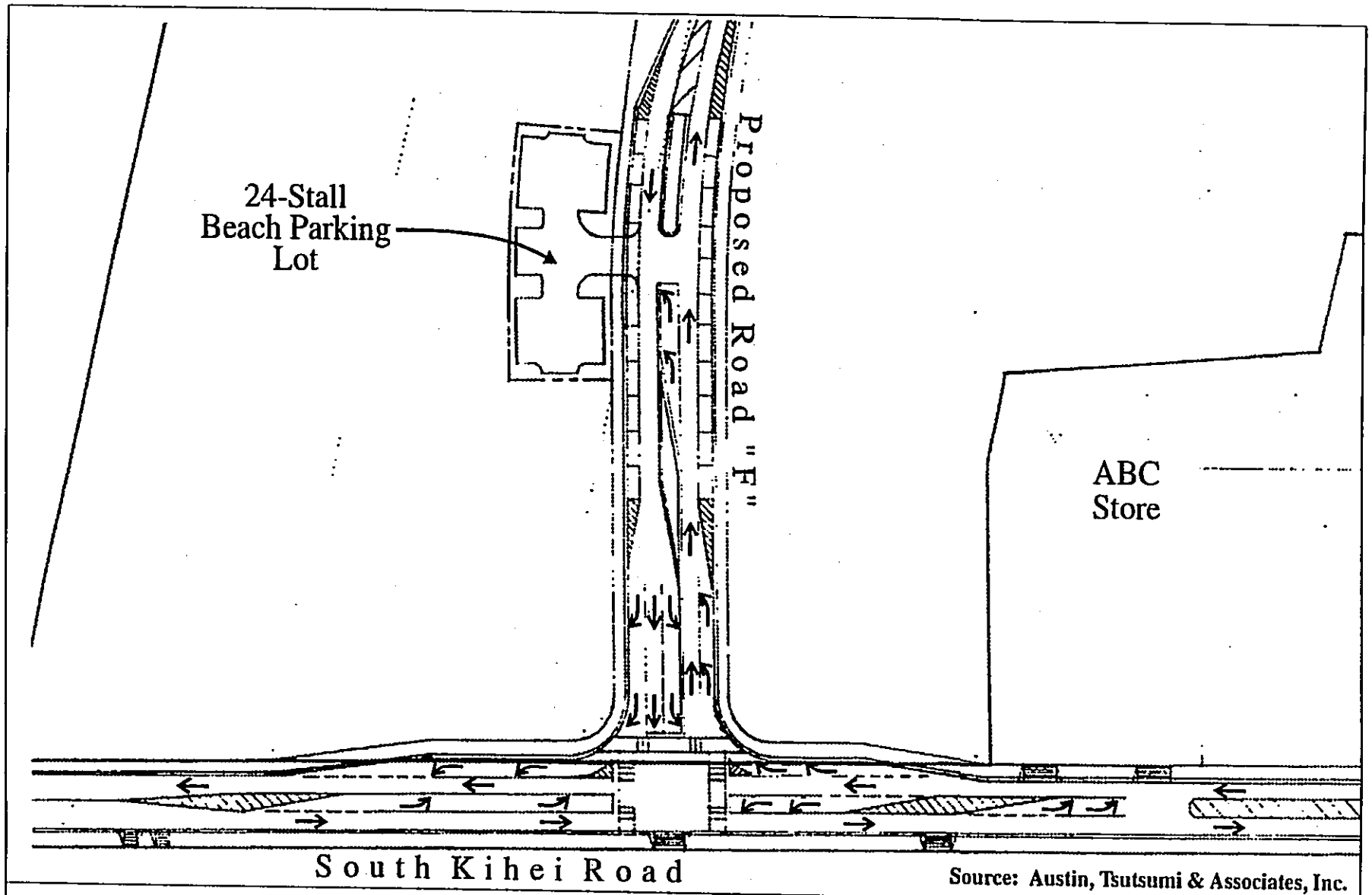
Source: Austin, Tsutsumi & Associates, Inc.

Figure 3 Road "F"/Kamaole Heights

Intersection Detail Plan at Kanakanui Road and Piilani Highway

50 200
0 Feet
100

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership



Source: Austin, Tsutsumi & Associates, Inc.

Figure 4

Road "F"/Kamaole Heights

Intersection Detail Plan at South Kihei Road

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

of Road "F" and South Kihei Road, there are separate left and right turn lanes. There is also a through lane which connects with the existing parking lot at Kamaole Beach Park I. Travelling mauka from the South Kihei Road intersection, there are two lanes which merge into one mauka bound travel lane.

On South Kihei Road, there is a right turn deceleration lane onto Road "F". From Road "F", there is a right turn merge lane to South Kihei Road. Finally, the project entails left turn storage lanes from South Kihei Road to Road "F" and the Kamaole Beach Park I parking lot.

The Road "F" improvements are proposed in connection with the new Kamaole Heights Subdivision. Kamaole Heights is proposed to occupy the makai portion of lands designated as TMK 3-9-19:por. 6. The mauka portion of this parcel totalling 12 acres is proposed as the second Kihei Elementary School site.

Kamaole Heights contains lots ranging in area from 5,500 square feet to 7,444 square feet. It is anticipated that dwellings would be constructed under the R-0 zero lot line overlay provisions noted in Chapter 19.84 of the Maui County Code. This allows housing which has the attributes of detached single family dwellings but which allows placement of dwellings against one of the property lines, permitting the outdoor space to be grouped and utilized to its maximum benefit.

Depending on market conditions, the project may entail the sale of improved lots to individual owner-builders or the sale of house and lot packages. Projected sales prices for the lots are approximately $120,000.00. Should the project involve the sale of improved lots, it is

anticipated that covenants would guide the construction of zero lot line homes within the subdivision.

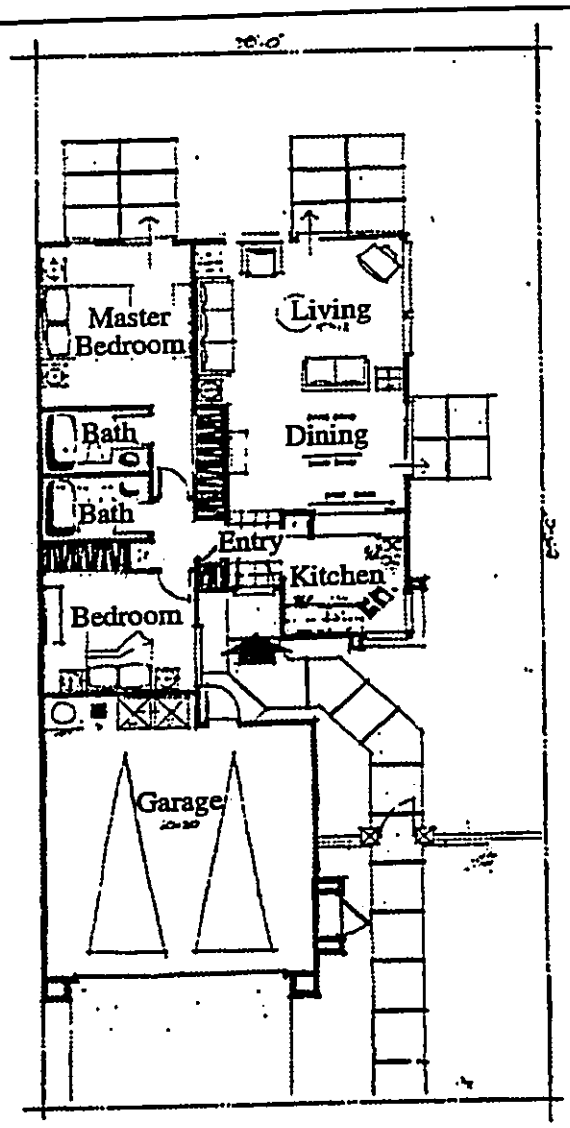
Typical zero lot line homes for the house and lot package are shown in Figure 5 and Figure 6. Two-bedroom, two-bath homes as well as three-bedroom, two-bath homes are contemplated. Interior living area for each home could range from approximately 970 to 1450 square feet in size. Should house and lot packages be sold to interested purchasers, sales prices are anticipated to be in the range of $225,000.00 to $260,000.00.

Depending on market conditions the project may involve the construction of a recreation center intended for residents of the subdivision which could include a deck, swimming pool, and restroom facilities. Should a recreation center be included in the project, it would occupy one of the lots in the 62 lot subdivision. See Figure 7.

The project also involves the construction and dedication of one-half of the right-of-way for the future North-South Collector Road for the area makai of the Kamaole Heights Subdivision. A 30 foot wide right-of-way would be dedicated to the County of Maui for the Kamaole Heights Subdivision parcel (TMK 3-9-19:por. 6).

Construction of Road "F" will affect State and County rights-of-way. These are the circumstances which prompt the environmental review process. In addition, all improvements described above fall within the County's Special Management Area. A major permit application is required to be filed with the County Planning Department for consideration by the Maui Planning Commission.

Typical 2-Bedroom
2-Bath Floor Plan



Front
Elevation

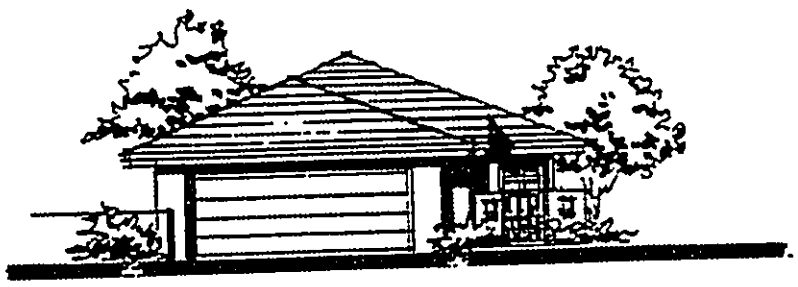
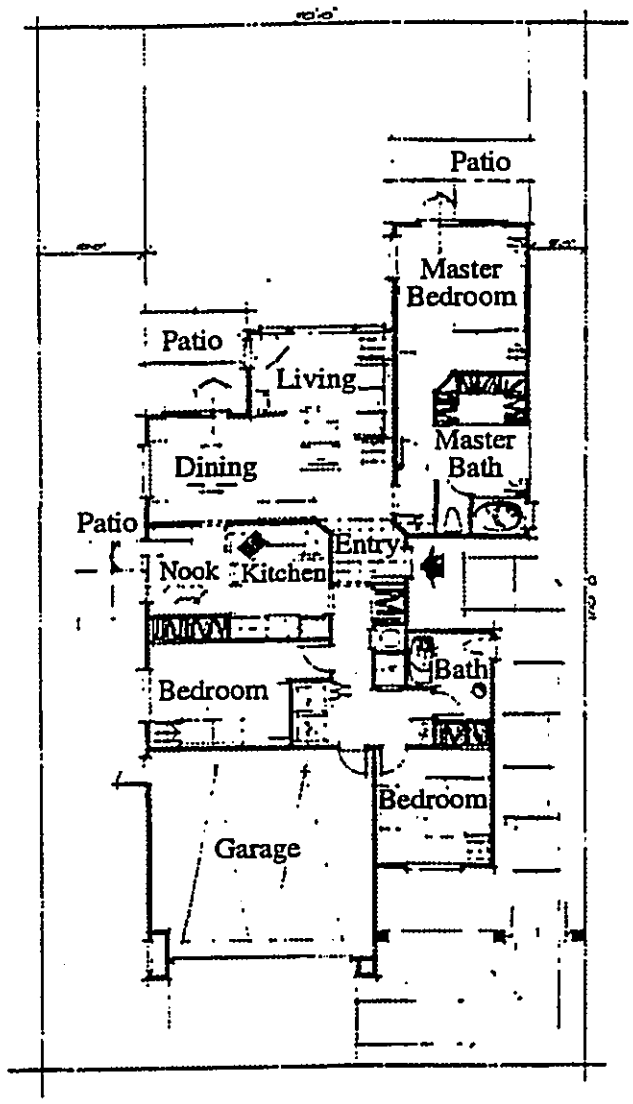


Figure 5 Road "F"/Kamaole Heights
Typical 2-Bedroom 2-Bath Floor
Plan and Front Elevation

NOT TO SCALE

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

Typical 3-Bedroom
2-Bath Floor Plan



Front Elevation

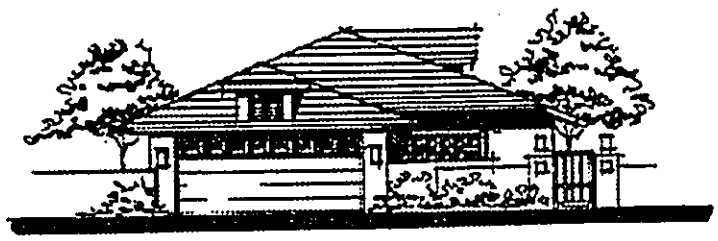


Figure 6 Road "F"/Kamaole Heights

Typical 3-Bedroom 2-Bath Floor Plan and Front Elevation

NOT TO SCALE

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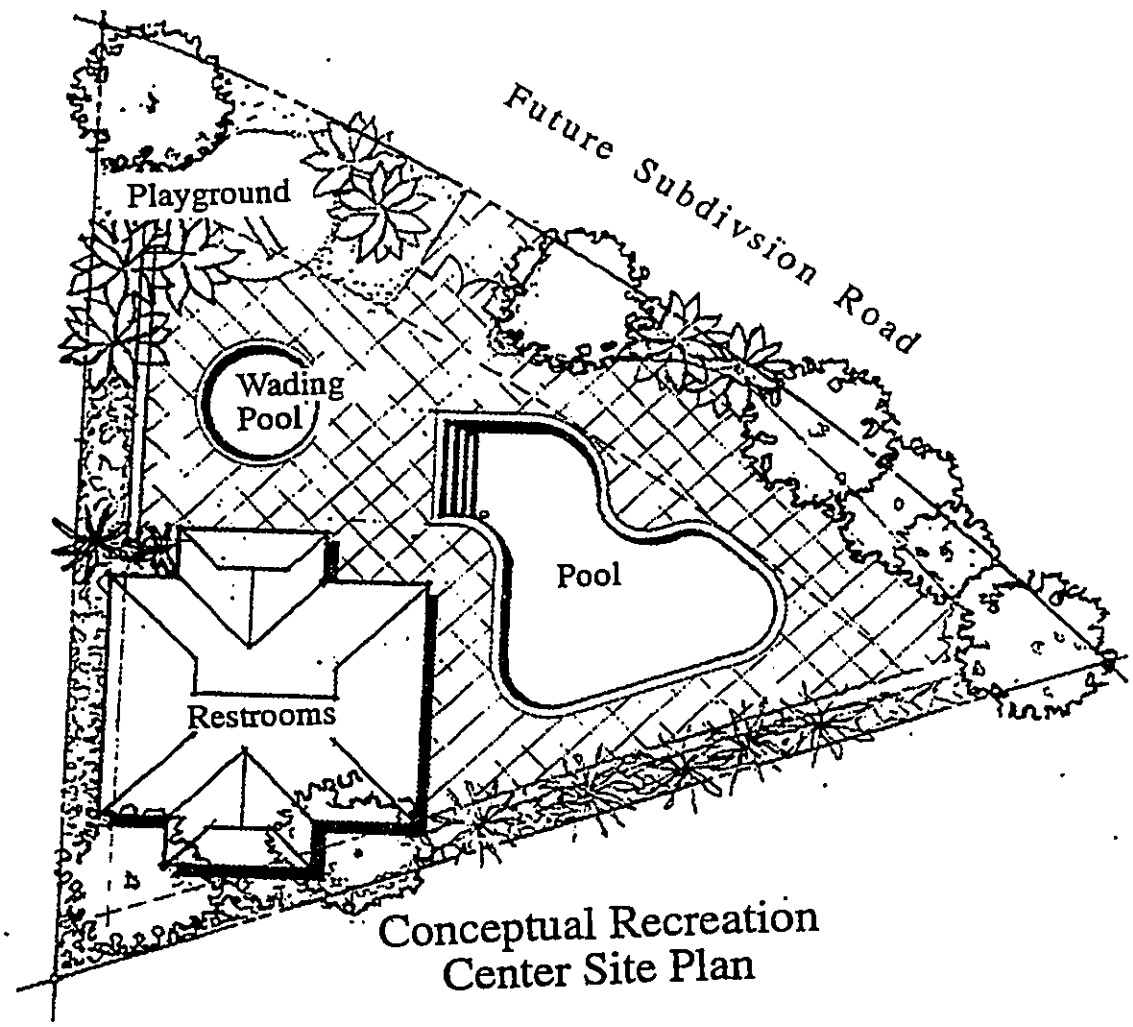
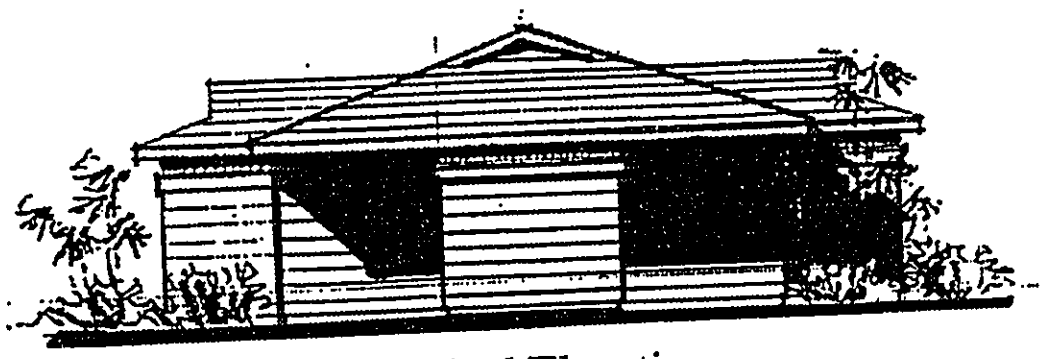
Prepared for: KOAHE Limited Partnership



Conceptual Recreation Center Site Plan



Typical Elevation of Restroom Facility

Figure 7 Road "F"/Kamaole Heights
Conceptual Recreation Center
Site Plan and Elevation

NOT TO SCALE

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

Assuming all applicable permits are obtained, construction of the project may begin in September 1994 and be completed in August 1995. Estimated costs of Road "F", the North-South Collector Road segment and other off-site improvements are $3.75 million. The costs of the Kamaole Heights Subdivision into improved lots are $2.25 million. Should the project involve the sale of house and lot packages, costs for the homes and recreational center would be approximately $6.8 million.

Chapter II

Description of the Existing Environment

II. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. Surrounding Environment

The project site is located in Kamaole, Maui, within the southern portion of the Kihei District. The residential subdivision comprises 11.256 acres with Road "F" extending in an east-west direction. At its eastern or mauka terminus, Road "F" links with Kanakanui Road and Piilani Highway. At its western or makai terminus, Road "F" links with South Kihei Road.

Vacant and undeveloped lands lie to the north of the proposed residential subdivision and Road "F". Further north of the proposed residential subdivision lies the single family residential area around Auhana and Kanani Roads. Closer to South Kihei Road, the Road "F" alignment is bounded on the north by vacant lands, the Maui Coast Hotel, and the Pacific Shores residential condominium.

To the west of the project across South Kihei Road lies Kamaole Beach Park I. There are vacant and undeveloped lands on the south side of the project. Further south abutting the South Kihei Road frontage are the ABC Shopping Center, Kamaole Beach Club, and Dolphin Plaza. On the Kanakanui Road frontage, there is a 28.57 acre vacant parcel and the Keonekai Heights Subdivision to the south of the project site.

To the immediate east of the Kamaole Heights Subdivision site is a 12-acre vacant parcel which is intended to be the site of the proposed second Kihei elementary school. Piilani Highway lies further east and generally is parallel to Kanakanui Road.

2. ***Climate***

The Kihei Coast, which encompasses the site is generally sunny, warm and dry the entire year. In Kihei Town, the average annual high temperature is 86 degrees Fahrenheit with the average low temperature being 63 degrees Fahrenheit (Environment Impact Study Corporation, 1982). June through August are historically the warmer months of the year, while the cooler months are January to March.

Average rainfall distribution in the Kihei-Makena region varies from under 10 inches per year to 20 inches per year in the higher elevations. Rainfall in the Kihei-Makena region is highly seasonal, with most of the precipitation occurring in the winter months.

Northeast tradewinds prevail approximately 80 to 85 percent of the time. Winds average 10 to 15 miles per hour during afternoons, with slightly lighter winds during mornings and nights.

3. ***Topography and Soil Characteristics***

The topography of the site ranges from relatively flat to gently sloping. The average slope from the Road "F"-Kanakanui Road intersection to the Road "F"-South Kihei Road intersection is approximately 4 percent. Slopes within the Kamaole Heights Subdivision and the 24 stall proposed parking lot site exhibit similar characteristics. Elevations range from approximately 10 feet above sea level in the area of the Road "F" intersection with South Kihei Road to approximately 120 feet above sea level in the area of the Road "F" intersection with Piilani Highway.

Underlying the project site is the Pulehu-Ewa-Jaucas soil association which is characterized by deep, nearly level to moderately sloping, well-drained and excessively drained soils. The underlying material is moderately fine-textured to coarse-textured subsoil. This soils occurs on alluvial fans and in basins. See Figure 8.

The soil types at the project site are Puuone sand, 7 to 30 percent slopes (PZUE) and Jaucas sand, 0 to 15 percent slopes (JaC). See Figure 9.

Puuone sand, 7 to 30 percent slopes, is located on sandhills near the ocean. In a representative profile, the surface layer is grayish brown, calcareous sand approximately 20 inches thick. This is underlain by grayish-brown cemented sand. Permeability is rapid above the cemented layer. Runoff is slow , and the hazard of wind erosion is moderate to severe.

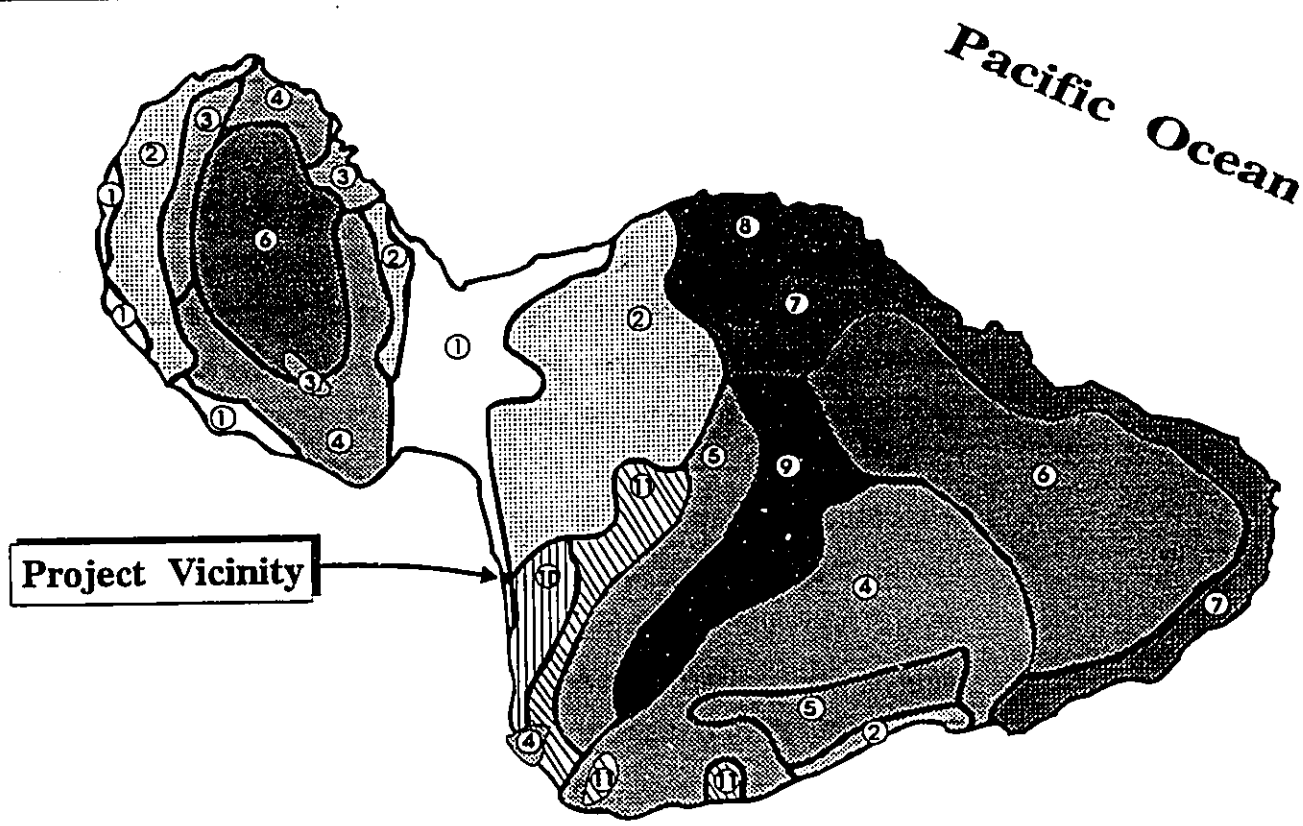
A representative profile for Jaucas sand, 0 to 15 percent slopes, can be described as single grain, pale brown to very pale brown, sandy, and more than 60 inches deep. In many places the surface layer is dark brown as a result of accumulation of organic matter and alluvium. Permeability is rapid, and runoff is very slow to slow.

4. ***Flood and Tsunami Hazard***

According to the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency, the entire project site is designated as Zone C, areas of minimal flooding. See Figure 10.

LEGEND

- ① Pulehu-Ewa-Jaucas association
- ② Waiakoa-Keahua-Molokai association
- ③ Honolua-Olelo association
- ④ Rock land-Rough mountainous land association
- ⑤ Puu Pa-Kula-Pane association
- ⑥ Hydrandepts-Tropaquods association
- ⑦ Hana-Makaalae-Kailua association
- ⑧ Pauwela-Haiku association
- ⑨ Laumaia-Kaipoipoi-Olinda association
- ⑩ Keawakapu-Makena association
- ⑪ Kamaole-Oanapuka association



Map Source: USDA Soil Conservation Service

Figure 8 Road "F"/Kamaole Heights
Soil Association Map

NOT TO SCALE

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

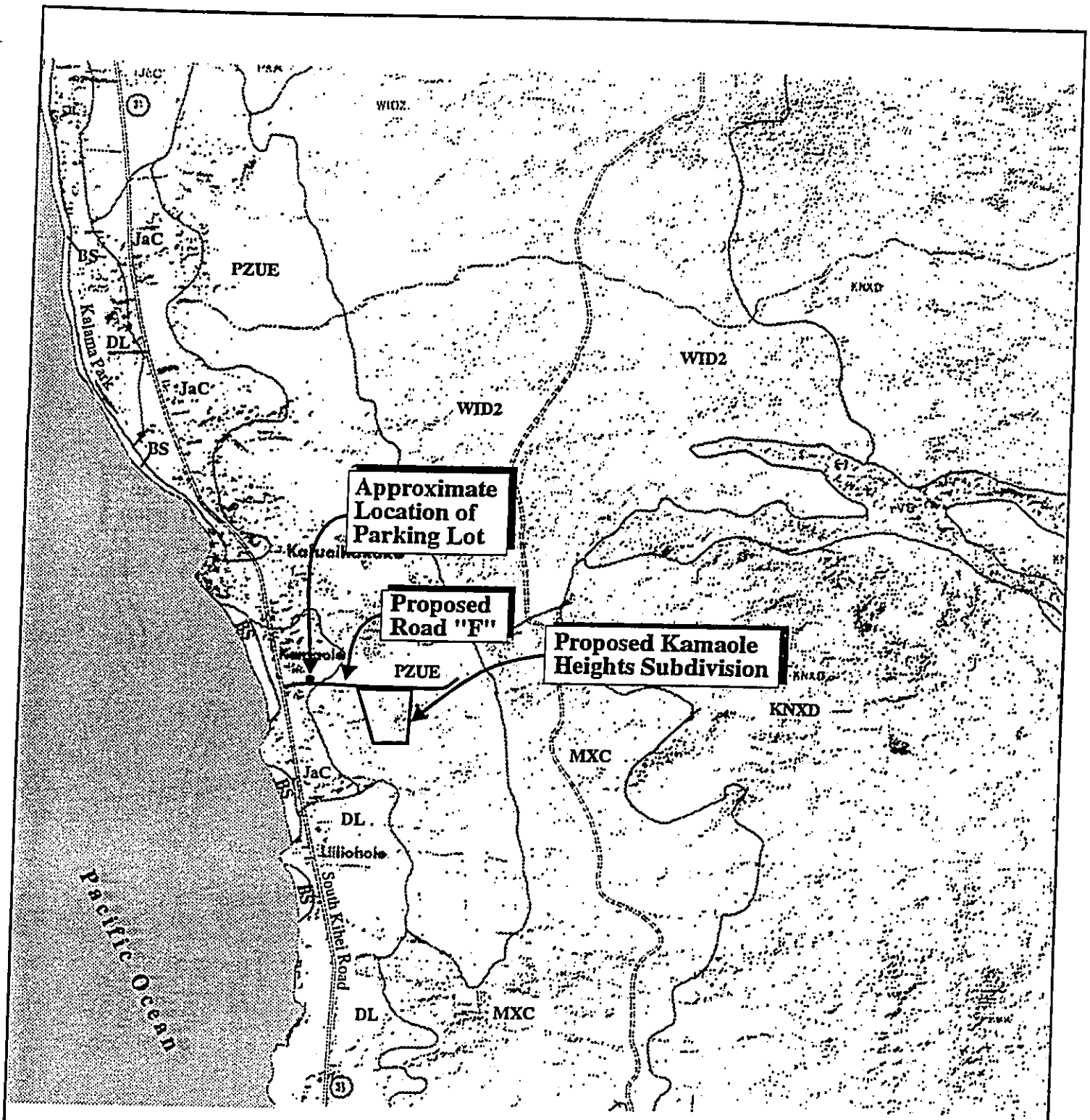


Figure 9 Road "F"/Kamaole Heights
Soil Classification Map

1000 0 2000 4000 Feet

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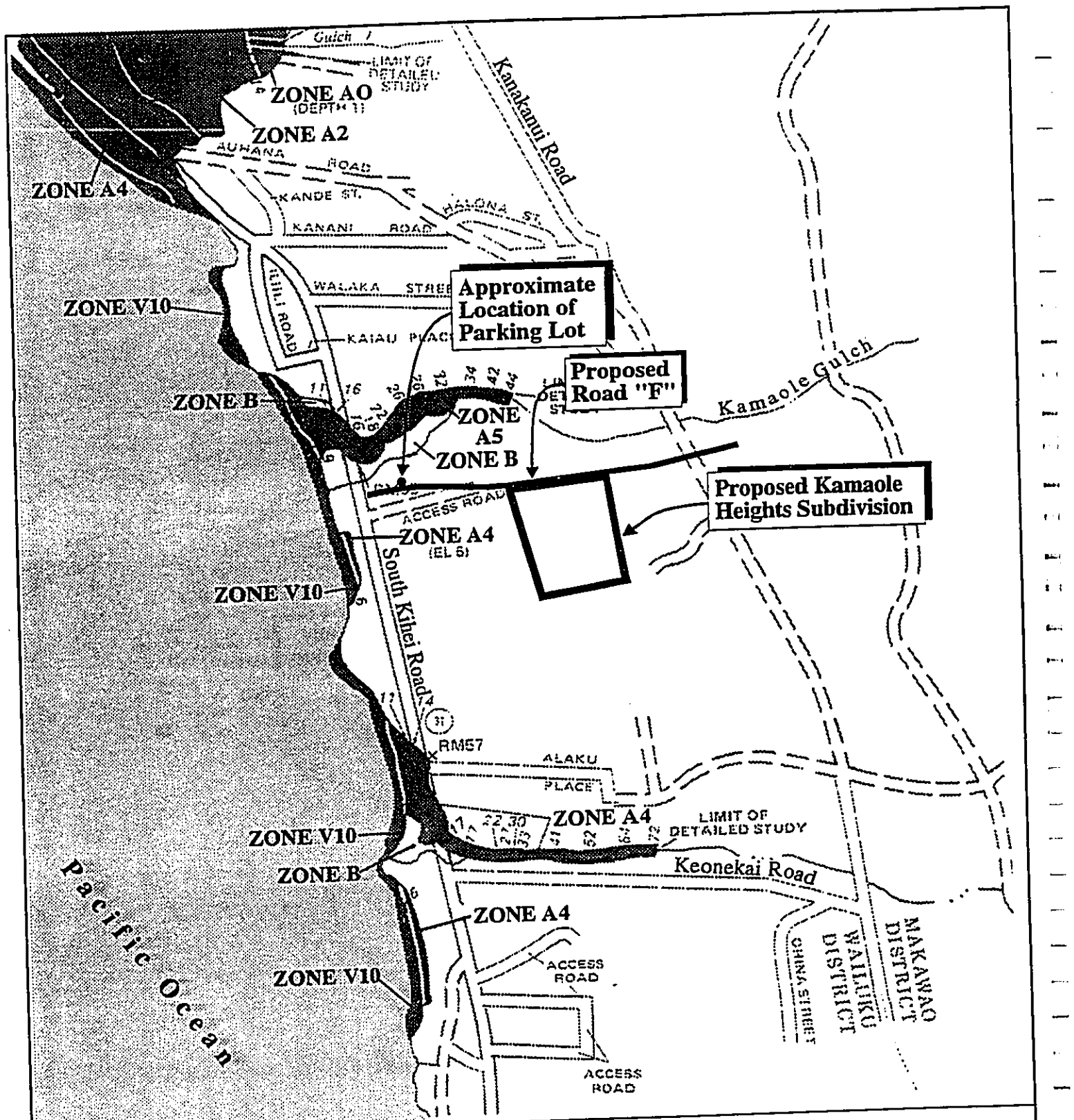

Figure 10 Road "F"/Kamaole Heights

Flood Insurance Rate Map

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5. ***Flora and Fauna***

A botanical survey was done for five (5) tax map parcels (TMK 3-9-18:17 and 21; 3-9-20:20 and 27; and 3-9-19:4). See Appendix A. The proposed project involves portions of the parcels analyzed within the botanical survey.

Vegetation in this area consists primarily of buffel grass with scattered kiawe trees. Evidence of former house sites along with remnant landscape plantings can be found on the makai half of the property.

The buffel grass/kiawe association is more or less uniform throughout the five parcels. It consists of low tussocky mats of buffel grass, from 1 to 2 feet tall, with scattered trees of kiawe. The tree cover is about 3 to 5 percent. Scattered throughout this vegetation type are shrubs of koa-haole, from 3 to 6 feet tall. In low-lying areas, the koa haole shrubs may form small thickets. Other species found occasionally are 'uhaloa and 'ilima. Rocky knolls and out croppings support a few plants of Natal redtop grass, hairy spurge and hairy merremia.

Along the northern boundary adjacent to the Maui Coast Hotel is a narrow band of greener vegetation and a drainage channel located between the 2 properties. Runoff from the hotel's sprinkler system supports a large and varied assemblage of mostly weedy plants. These include buffel grass, 'uhaloa, golden crownbeard, hairy horseweed, spiny amaranth, Eragrostis pilosa, tree tobacco, lion's ear, Asiatic butterfly bush and blue haze.

Former house sites and other structures can be found on the makai quarter of the parcels. There are concrete foundations, piles of lumber and other construction materials, and remnant landscape plantings among the buffel grass. These include a white-flowered Bougainvillea, oleander, vitex hedges, monkeypod, milo, and kou trees, coconut and horseradish tree. A large orchard of mango trees is found near the ABC Store. There are also two plants of the tree 'ohai found near one of the house sites.

Regarding fauna and avifauna, the site is characteristic of urban areas in the general vicinity. Fauna typically found in the vicinity include mongoose, mice, rats, dogs, and cats. Avifauna typically include Northern Cardinal, House Finch, and Gray and Black Francolin.

6. ***Wetlands***

The subject site is not depicted as wetlands on the National Wetlands Inventory maps done by the U. S. Department of the Interior. Further, there is no evidence of free standing water on the site or evidence of plant species which could indicate wetlands on the site.

7. ***Air Quality***

There are no point sources of airborne emissions in the immediate vicinity of the project site. The air quality of the Kihei area is considered good with existing airborne pollutants attributed primarily to automobile exhaust from the region's roadways. Another source of airborne emissions may include smoke from sugarcane burning which occurs in the Central Maui isthmus. This

source is intermittent, however, and prevailing tradewinds quickly disperse particulates which are generated.

8. ***Noise Characteristics***

Background noise in this locale can be attributed to traffic travelling along South Kihei Road, Kanakanui Road and Piilani Highway. Closer to South Kihei Road, ocean surf is also a source of background noise.

9. ***Scenic and Open Space Resources***

The site of the residential subdivision is located approximately 1,600 feet from the shoreline and is located mauka of South Kihei Road. Road "F", which extends from Piilani Highway to South Kihei Road, provides an important connector roadway. The site is not a part of or in proximity to scenic corridors.

10. ***Archaeological Resources***

An archaeological survey and testing done by Cultural Surveys Hawaii included lands within the subject project (Hammatt and Shideler, 1992). The Cultural Surveys study included approximately 54 acres of land in Kamaole (TMK 3-9-18:17 and 21; 3-9-20:20 and 27; and 3-9-19:6).

There are three (3) sites identified in the Cultural Surveys Hawaii study which are within the land area of the subject project. These are Sites 2633, 2634 and 2636. See Figure 11.

Site 2633 features a paving of coral pebbles and cobbles in an area 1.5 meters by 1.8 meters. In this immediate area, there are a small coral boulder, several pieces of branch coral and a small

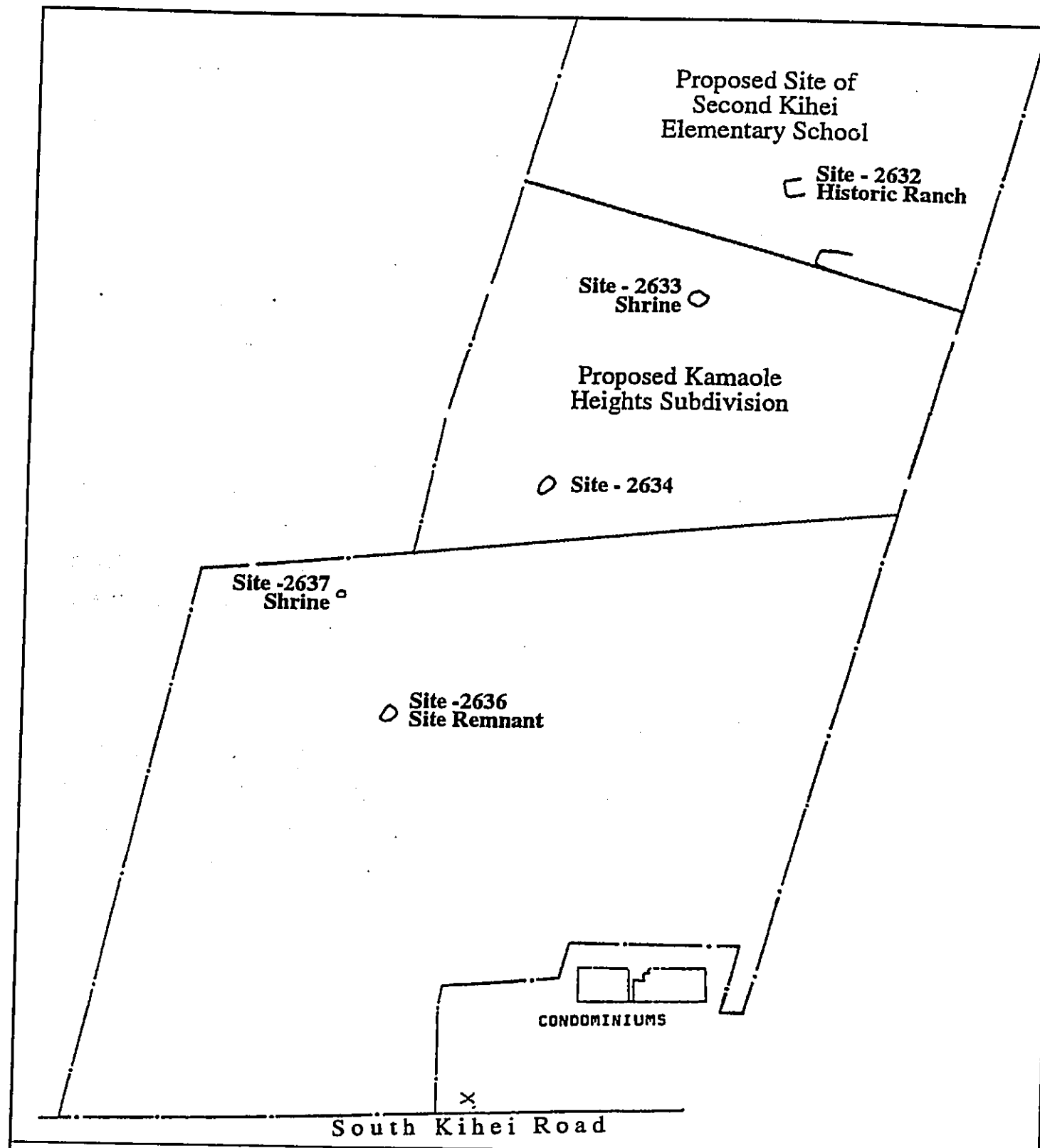

Figure 11 Road "F"/Kamaole Heights
Location of Archaeological Sites

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water-rounded basalt boulder. There were many cobbles and boulders of subangular basalt on the knoll but no obvious construction. A test excavation was done at this site. The top stratum between 0 to 10 centimeters contained no artifacts but considerable midden such as common marine molluska, sea urchin, and fish bone. The second stratum, from 10-15 centimeters to 50 centimeters, was essentially sterile.

A total of approximately 4 gallons of coral and water-rounded basalt was observed in the top 15 centimeters of the excavation unit. Below the surface, the human transported coral and basalt was limited to pebble-sized fragments and waterworn pebbles. No human bones were found. This site is thought to be a small fishing shrine.

Site 2634 features the piling of small boulders on the top and west southwest side of a low ridge ranging from .6 to .9 meters in height. There is a small waterworn basalt boulder on the top of this ridge and a scatter of pebble-sized coral fragments along a low ledge makai of the water-rounded basalt. The water-rounded basalt may have been supported by a pile of small subangular basalt boulders as a shrine.

Site 2636 appears to be a site remnant. It may have been a traditional Hawaiian site which was reworked during the construction of a foundation for a 3 meter diameter wooden water tank which has subsequently burned down. The presence of many metal artifacts, including metal bands, charred processed wood, bottle glass, an iron file, and cans attest to the historic utilization of the site. However, the presence of old coral, waterworn basalt

cobbles, plentiful midden, and sea urchin spines suggests that the water tank construction and /or bulldozing demolished a traditional Hawaiian site. Research potential was considered to be low and no testing was undertaken at this site.

Two (2) other archaeological sites discussed in the Cultural Surveys Hawaii study are of interest to the subject project. These are summarized below.

Site 2632 is located on the mauka boundary of the Kamaole Heights Subdivision. The Hammatt study interpreted this to be an older ranch site. The most prominent features of this site are a large platform and associated dump. The rectangular platform is 29 meters long extending in the north south direction and 7.6 meters wide. There is a large trash dump 30 meters southwest of this platform. The study notes that trash in the immediate area including a kerosene stove, water tank, water pipes, pipe railing, a child's wagon wheels, a welded barbecue, and roofing iron suggest that the site may have been a ranch field station or cattle loading area.

A recent site inspection with several interested members of the community as well as a staff member of the State Historic Preservation Office suggests that Site 2632 may have been an old house site rather than a ranch site. This preliminary conclusion was based on an informant's recollection that his relations lived at the site.

Site 2637 is located outside of the project area at approximately the 70 foot elevation. This site, interpreted to be a shrine, featured

approximately 100 coral fragments, cobbles and pebbles in a roughly oval shaped area 1.8 meters by 1.2 meters. The coral pieces are localized off the northwest portion of a bedrock ledge between .6 meters to .9 meters high. A few water-rounded basalt pebbles and cobbles were also noted here. A triton shell fragment was noted in the immediate area.

Three test trenches were dug in the area. Two of the trenches uncovered varieties of marine shells, crustacean remains, and fish bone. The third trench was dug on top of the bedrock outcrop to verify that the soil was shallow. Bedrock was found at average depth of 20 centimeters.

B. COMMUNITY SETTING

1. Land Use and Community Character

The Kihei-Makena Community Plan region includes a diverse range of physical and socio-economic environments. With its dry and mild climate and proximity to recreation-oriented shoreline resources, the visitor-based economy has grown steadily over the past few years. The town of Kihei serves as the commercial and residential center of the region with the master-planned communities of Wailea and Makena serving as the focal point for visitor activities.

The project site is located within Kihei, mauka of Kamaole Beach Park I.

2. Population

The population of the County of Maui has exhibited relatively strong growth over the past decade, with the 1990 population estimated

at 100,374, a 41.7 percent increase over the 1980 population of 70,847. Growth in the County is expected to continue, with resident population projections to the years 2000 and 2010 estimated to be 123,900 and 145,200, respectively (DBED, 1990).

Just as the County's population has grown, the resident population of the region has increased dramatically in the last two decades. Population gains were especially pronounced in the 1970's as the rapidly developing visitor industry attracted many new residents. The current resident population of the Kihei-Makena region is estimated at 15,365. A projection of the resident population for the years 2000 and 2010 are 19,885 and 22,830, respectively (Community Resources, Inc., 1992).

3. ***Economy***

The economy of Maui is heavily dependent upon the visitor industry. In 1991, for example, total visitor expenditures equalled $2.4 billion (First Hawaiian Bank Research Department, 1992). The dependency on the visitor industry is especially evident in Kihei-Makena, which is one of the State's major resort destination areas. The openings of the Four Seasons Hotel, the Grand Wailea and Kea Lani Hotel have boosted the region's significance as a resort destination.

Support for the visitor industry is found in Kihei, where numerous retail commercial centers are found. New commercial centers in Kihei, such as Azeka's and the Longs Drugs complexes, will lend further support to the regional economy.

4. ***Housing***

The existing islandwide housing need has been estimated at 7,500 units. Estimates suggest that the islandwide shortfall is occurring at the rate of 800 to 900 housing units per year (Locations, Inc., November 1989).

5. ***Police and Fire Protection***

The County of Maui's Police Department is headquartered at its Wailuku Station. The Department consists of several patrol, investigative and administrative divisions. The Department's Kihei Patrol covers the Kihei-Makena region.

Fire prevention, suppression and protection services are offered by the County's Department of Fire Control. The Kihei Station, which services the Kihei-Makena region, is located on South Kihei Road near Kalama Park and is located approximately one (1) mile from the proposed Kamaole Heights Subdivision.

6. ***Medical Facilities***

Maui Memorial Hospital, the only major medical facility on the Island, services the Kihei-Makena region. Acute, general and emergency care services are provided by the 145-bed facility which is located in Wailuku. Medical/dental offices are located in the Kihei area to serve the region's residents.

7. ***Recreational Facilities***

Diverse recreational opportunities are available in the Kihei-Makena region. Recreational facilities in close proximity to the project site include the Kalepolepo Park, Silversword Golf Course, Kalama Park, Kamaole Beach Parks I, II and III, and numerous other beach

parks along the Kihei coastline. Shoreline recreation includes swimming, fishing, picnicking and snorkeling.

The proposed project includes Road "F" which would intersect South Kihei Road in the vicinity of Kamaole Beach Park I. The beach park is 2.983 acres in size and also contains a 20 stall all-weather surface parking lot.

The Wailea-Makena resort areas to the south of the project site offer additional opportunities for golf, tennis and ocean-related activities.

8. Schools

The State Department of Education operates two schools in the Kihei area. Kihei Elementary School covers Grades K to 6, while Lokelani Intermediate School includes Grades 7 and 8. Public school students in Grades 9 through 12 attend H.P. Baldwin High School in Wailuku.

9. Solid Waste

Single-family residential solid waste collection service is provided by the County of Maui on a once-a-week basis. Residential solid waste collected by County crews are disposed at the County's 55-acre Central Maui Landfill located four miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill accepts commercial waste from private collection companies.

C. INFRASTRUCTURE

1. Roadway System

Access to the Kihei region is provided by North Kihei Road from West Maui and the Wailuku area, and Mokulele Highway and Piilani Highway from the Kahului area and from "Up Country". These roadways are two-lane, two-way roadways. North Kihei Road becomes South Kihei Road, near its junction with Mokulele Highway and continues southward through Kihei Town.

South Kihei Road is a two-lane, two-way roadway that is generally oriented in the north-south direction. The roadway generally follows the coastline through Kihei Town with lane widths of 11 feet in each direction. The posted speed limit on South Kihei Road, in the project vicinity, is 30 miles per hour (mph).

Piilani Highway is a high-quality, two-lane highway. Its alignment is generally parallel to and mauka of South Kihei Road. Piilani Highway has paved shoulders with left and right-turn deceleration lanes at major intersections. Piilani Highway begins at North Kihei Road and terminates at Wailea Ike Drive in the Wailea Resort.

Kanakanui Road is a two-lane, two-way roadway which is oriented in a north-south direction. Kanakanui extends from the Kanani Street area to Keonekai Road. For most of its alignment, Kanakanui Road is parallel to Piilani Highway. In the vicinity of the proposed Road "F" alignment, the distance between Piilani Highway and Kanakanui Road is slightly more than 100 feet.

Access between Piilani Highway and South Kihei Road in the project vicinity is provided by two roadways. Kanani Road is a

mauka-makai collector roadway between Piilani Highway and South Kihei Road, located to the north of the project site. Located to the south of the project site, Keonekai Road also is a mauka-makai collector roadway between Piilani Highway and South Kihei Road.

2. ***Water***

The Kihei-Makena region is served by the Central Maui Water System. Source wells located in upper Waiehu provide water for the region. There are presently four (4) existing County waterlines within the vicinity of the project site. A 6-inch cast iron waterline exists along South Kihei Road. There is a 16-inch waterline along the future alignment of the North-South Collector Road. There is a 30-inch transmission line along Kanakanui Road. There is a 12-inch waterline along the southern boundary of TMK 3-9-20:20.

3. ***Drainage***

The project site is primarily located within the Kamaole Gulch Drainage Basin. See Appendix D. Three (3) culvert crossings mauka of the project site intercept storm runoff from the mauka areas of the drainage basin. There are three (3) 36-inch diameter corrugated metal pipes located at Piilani Highway just mauka of the Kamaole Heights Subdivision. A second culvert crossing at Kamaole Gulch and Piilani Highway consists of two (2) 96-inch diameter corrugated metal pipes. A third culvert crossing located just makai at Kanakanui Road, consists of a 48-inch diameter corrugated metal pipe.

Storm runoff for the Kamaole Drainage Basin converges at two (2) 72- inch diameter culverts near the Maui Coast Hotel. This leads

to an 8.5 feet by 7 feet metal culvert which crosses South Kihei Road. An underground drainage collection system makai of the project site along South Kihei Road connects to the outlet of the 8.5 feet by 7 feet culvert. The runoff from the culvert and the underground collection system discharges to the ocean through an existing concrete lined channel.

4. ***Wastewater System***

The service area for the County's Kihei Wastewater Reclamation System extends from North Kihei to Makena. The system consists of a number of pump stations and force mains which convey wastewater through the County's transmission lines. Pump Station Nos. 2-5 conveys flows from North Kihei to Pump Station No. 6 which is located adjacent to the Kihei Fire Station within Kalama Park. Pump Stations 6-10 and 16 convey flows from Makena, Wailea and South Kihei to Pump Station No. 6. The combined flows are transported to the Kihei Wastewater Reclamation Facility, which is located adjacent to the Silversword Golf Course. The existing design capacity of the Kihei Wastewater Reclamation Facility is 6.0 million gallons per day (MGD).

There is an existing 15-inch gravity sewer line and a 16-inch force main located along South Kihei Road in the vicinity of the project. Wastewater Pump Station No. 7 is located just south of the project site within the Kamaole Beach Park I.

5. ***Electrical and Telephone System***

Electrical and telephone service to the site will be provided by Maui Electric Company and GTE Hawaiian Tel, respectively.

Chapter III

Potential Impacts and Mitigation Measures

III. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. IMPACTS TO THE PHYSICAL ENVIRONMENT

1. Surrounding Uses

The proposed Road "F", Kamaole Heights Subdivision and 24-stall parking lot are located in the Kamaole area of the Kihei-Makena region. The proposed Road "F" will implement the Kihei Traffic Master Plan and provide an additional east-west connection between South Kihei Road and Piilani Highway. Lands surrounding the proposed roadway and parking lot are vacant and undeveloped. The proposed land uses for the vacant lands, as reflected by the current Kihei-Makena Community Plan are single-family and hotel.

The subdivision is in keeping with the largely single family residential nature of areas abutting the makai boundary of Piilani Highway. The property on the mauka side of the Kamaole Heights Subdivision is projected as the second Kihei Elementary School. This also complements the proposed project. Further makai along South Kihei Road, the land use emphasis shifts to commercial, hotel and park uses. The proposed project is in keeping with surrounding developments.

2. Flora and Fauna

The buffel grass/kiawe association which covers the majority of the property is the characteristic vegetation type found on the dry, lowland, leeward slopes of Haleakala. There were a total of 63 plants inventoried in the botanical survey done for the project. It should be noted that although the botanical survey covered lands designated as TMK 3-9-18: 17 and 21; 3-9-20:20 and 27; and 3-9-19:6, the proposed project involves only portions of these parcels.

The survey found 57 (91 percent) introduced or alien plants, two (2) (3 percent) plants of Polynesian introduction, and four (4) (6 percent) native plants. Of the native plants, only the tree 'ohai is endemic (i.e., native only to the Hawaiian Islands). The other three (3) native species are indigenous (i.e., native throughout the Pacific including Hawaii). None of the plants are listed or proposed as endangered or threatened species. See Appendix A.

However, the tree 'ohai is considered a Category 1 candidate endangered species which means that there is enough information on biological vulnerability and threats to support a proposal to list it as an endangered or threatened species. The two (2) plants, each about 10 feet tall, are found on lands designated as TMK 3-9-20:20. These plants are located outside of construction areas involved as part of the subject project. It is approximately 600 feet south of proposed Road "F" construction and approximately 500 feet west northwest of the proposed North-South Collector Road segment and Kamaole Heights. See Figure 12.

The 'ohai are of the same age and size with no smaller plants or seedlings present. It appears that the plants are located in an area around which were formerly two large homes. Thus, it appears that the two (2) plants are not a natural population.

The proposed development of the site is not expected to have a significant negative impact on botanical resources since the site is dominated primarily by introduced plants such as buffel grass and kiawe. Seeds from the 'ohai have been collected and will be distributed to various botanic gardens and arboreta. The use of 'ohai as part of the landscaping plan within the Kamaole Heights

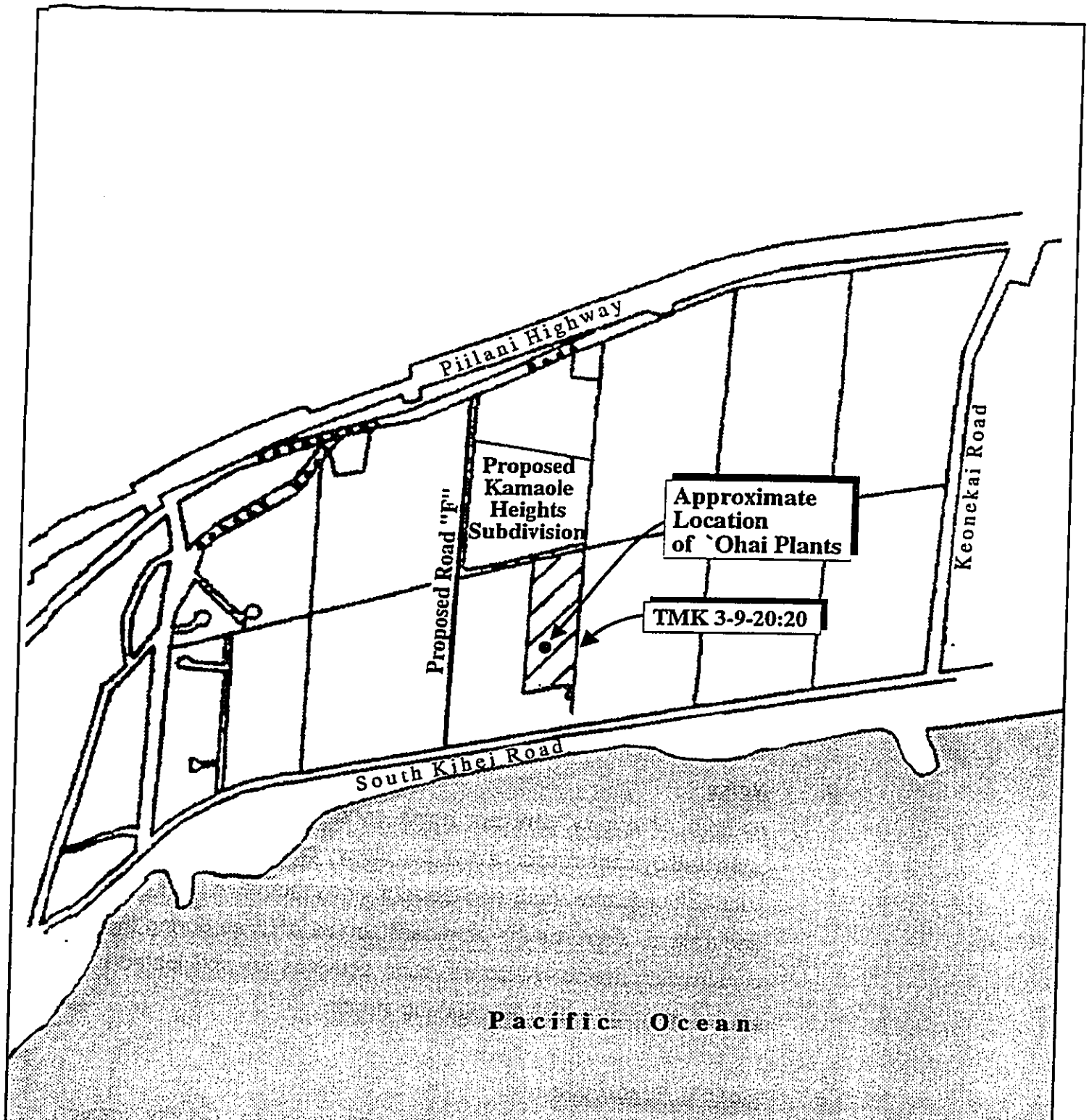

Figure 12 Road "F"/Kamaole Heights
Approximate Location of `Ohai

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Subdivision will also be considered.

There are no known significant habitats of rare, endangered or threatened species of fauna or avifauna located on the project site.

3. ***Air Quality***

Air quality impacts attributed to the project will include dust generated by short-term, construction-related activities. Site work such as clearing, grubbing and grading, utilities and roadway construction for example, will generate airborne particulates. Dust control measures, such as regular watering and sprinkling, will be implemented to minimize wind-blown emissions.

Once the project is completed, subdivision-related and through vehicular traffic along Road "F" will generate automotive emissions. However, project-related emissions are not expected to adversely impact local and regional ambient air quality conditions.

4. ***Noise***

As with air quality, ambient noise conditions will be temporarily impacted by construction activities. Heavy construction equipment, such as bulldozers, front-end loaders, and materials-carrying trucks and trailers, would be the dominant source of noise during the site construction period. All construction activities are anticipated to be limited to normal daylight working hours.

5. ***Scenic Resources***

Road "F" will be landscaped according to County design requirements. The Kamaole Heights Project will also be fully landscaped to create a site visually integrated with the surrounding

properties. The proposed 24 stall parking lot is also proposed to provide landscaping and shade trees in accordance with Maui County Code provisions. The project will not encroach into view corridors along the coastline.

6. ***Archaeological Resources***

The project would involve the preservation of Site 2633 in place. It is interpreted to be a small fishing shrine which is determined to be of significant cultural value. Any applicable requirements regarding its preservation will be coordinated with the Historic Preservation Division of the Department of Land and Natural Resources.

Although Site 2637 is located outside of the boundaries of the project, it is also a fishing shrine which is significant for its cultural value. This site is located on lands owned by KOAHE Limited Partnership. The intent is to preserve this site at the time that particular parcel is developed.

Sites 2632 and 2634 have been evaluated as no longer significant to the interests of historic preservation. See Appendix B. However, recent analysis has suggested that Site 2632 may have been a family residence rather than a historic ranch site. This is based on preliminary data presented by an informant. Since most of Site 2632 is located within the parcel proposed for the second Kihei Elementary School, any applicable requirements regarding further research and/or documentation should be coordinated with the Department of Accounting and General Services. The proposed project will not affect portions of Site 2632 within the

project area without first contacting the State Historic Preservation Division.

Site 2636 is a site remnant. According to the Hammatt Study, research potential was considered to be low and no testing was undertaken.

B. IMPACTS TO COMMUNITY SETTING

1. Local Economy

On a short-term basis, the project will support construction and construction-related employment. Over the long term, the project will provide limited support for roadway maintenance and services for subdivision residents.

2. Housing

The proposed project consists of a total of 62 lots, or house and lot packages which are anticipated to be completed around August 1995. The islandwide housing need has been estimated at 7,500 units based on a 1989 estimate. By the year 1995, an additional 3,912 housing units are required to meet housing demand on the island of Maui (Community Resources, Inc., March 1992). Thus, there are significant numbers of new units needed to address existing housing unit shortfalls as well as the demands of an increasing population.

3. Agriculture

The project site is currently not in agricultural use. The proposed development will not have any negative impacts on agricultural endeavors.

4. ***Police, Fire and Medical Services***

Medical, police and fire protection services are not expected to be adversely impacted by the proposed project. The project is not anticipated to extend existing service area limits for emergency services.

5. ***Recreational and Educational Facilities***

The project is anticipated to comply with the County of Maui's park assessment provisions. The project is proposing to provide land and improvements for a 24 stall public parking lot approximately 300 feet mauka of South Kihei Road. This is intended to be parking for beach goers which helps alleviate the existing parking congestion at Kamaole Beach Park I. Parking lot improvements will cost an estimated $80,000 and involve the dedication of approximately 10,500 square feet of land to the County of Maui. The land and improvements for the 24 stall parking lot would significantly exceed the County's park assessment requirements and result in park assessment credits.

The proposed project is anticipated to generate approximately 20 children from grades K-5, five (5) children from grades 6-8, and six (6) children from grades 9-12 (telephone conversation with Tom Saka, Department of Education, August 30, 1993).

It should be noted that the State of Hawaii is currently negotiating with the land owner to purchase the 12 acre property mauka of the proposed Kamaole Heights Subdivision for the second Kihei Elementary School. Completion of construction is projected in 1996. The second elementary school will provide a much needed

facility to ease the burden at the existing elementary school facility on Lipoa Street.

6. *Solid Waste*

A solid waste management plan will be developed in coordination with the Solid Waste Division of the County Department of Public Works and Waste Management for the disposal of clearing and grubbing material from the site during construction.

Refuse collection for the proposed Kamaole Heights Subdivision will be provided by the County of Maui. Solid waste generated from the project will be disposed at the County's Central Maui Landfill.

C. *IMPACTS TO INFRASTRUCTURE*

1. *Roadways*

Although Piilani Highway is the primary arterial highway in the region, the existing development pattern and road network are oriented around South Kihei Road as the primary arterial. From an overall road network perspective, there are too few connector roads between Piilani Highway and South Kihei Road to collect and distribute traffic to and from Piilani Highway. Moreover, several of these roadways, such as Ohukai Street, Lipoa Street, Keonekai Road and Kilohana Drive, are adequate for local traffic, but lack the carrying capacity to function as part of the collector-distributor system between South Kihei Road and Piilani Highway.

The Kihei Traffic Master Plan identifies four roadways as major connector roads between Piilani Highway and South Kihei Road. These are: Kaonoulu Street; Road "C" which is proposed to be

located between Waipuilani Road and Lipoa Street; Welakahao Road which is proposed to be realigned near Piilani Highway; and Road "F" which is located between Kanani Road and Keonekai Road. These roadways would typically be four lane roads with provisions for additional lanes at major intersections and access driveways to larger developments. The Kihei Traffic Master Plan projects the minimum right-of-way to be 60 feet.

The Kihei Traffic Master Plan also calls for the establishment of a North-South Collector Road which would lie between and parallel to Piilani Highway and South Kihei Road. The North-South Collector Road serves several purposes. First, it provides access for properties without direct connections to east-west connector roads. Second, it would aid in diverting some traffic from South Kihei Road. Third, it provides linkage between major and minor east-west connector roads and local roads. Finally, the North-South Collector road would provide a bicycle route and school bus route, as well as pedestrian facilities, between the existing Kihei School and surrounding residential areas. A minimum 60-foot right-of-way is proposed for the North-South Collector Road.

The proposed project provides for construction of two-lane sections of Road "F" for the segment immediately fronting the Kamaole Heights Subdivision extending makai to the 24 stall parking lot. However, there are additional laneage and intersection improvements within an 80 foot right-of-way for the segment abutting the second elementary school site to Piilani Highway. Improvements within an 80 foot right-of-way are also proposed for the Road "F" segment between the 24 stall parking lot to South Kihei Road.

For the segment of Road "F" from the makai boundary of the Kamaole Heights Subdivision to the 24 stall parking lot, the intent is to dedicate an ultimate 80 foot right-of-way to the County of Maui to allow provision of a four lane typical section if warranted by future traffic demand. For the segment of Road "F" which abuts the Kamaole Heights Subdivision, the project provides for one-half of an ultimate 80 foot right-of-way. Any additional rights-of-way should be acquired from the adjacent property (TMK:3-9-18:1) not under the control of KOAHE Limited Partnership.

The proposed project would also provide for one-half of the 60 foot right-of-way for the North-South Collector Road, as it adjoins the Kamaole Heights Subdivision.

The proposed second Kihei Elementary School site is located immediately mauka of the Kamaole Heights Subdivision. The projected enrollment for the new elementary school is between 800 and 1,000 students. The school is expected to open in September 1996.

Road "F" is anticipated to reduce traffic demands on existing mauka-makai roadways. A portion of traffic demand, currently using Kanani Road and Keonekai Road for access between Piilani Highway and South Kihei Road, is expected to be diverted to Road "F".

The traffic generated by the Kamaole Heights Subdivision represents about 2.5 percent of the existing AM and PM peak hour traffic volumes on Piilani Highway and South Kihei Road. Road "F" is consistent with the County's Kihei Traffic Master Plan and the

draft Kihei-Makena Community Plan update. Road "F" would improve the overall traffic circulation by providing direct access between South Kihei Road and Piilani Highway in the Kamaole area.

The specific roadway geometric requirements at the South Kihei Road, Kanakanui Road, and Piilani Highway intersections along the proposed Road "F" would be determined, based upon the projected traffic demands. A traffic study, addressing these issues, should be prepared at the design stage of development.

2. ***Water***

Water will be furnished to the proposed Kamaole Heights Subdivision by the domestic system servicing the area. The average daily demand for the project is estimated to be about 37,200 gallons per day.

The project will involve the extension of an existing 8-inch waterline along Kanakanui Road, from Alaku Street to Road "F". Then the waterline is proposed to be extended makai within Road "F" to provide service to the Kamaole Heights Subdivision.

3. ***Wastewater***

The proposed Kamaole Heights Subdivision is estimated to generate an average flow of approximately 19,840 gallons per day of wastewater. This is based on an average per capita wastewater flow of 80 gallons per day and four persons per dwelling.

The project involves the construction of an 8-inch sewer line from the Kamaole Heights Subdivision within the Road "F" right-of-way

extending makai to South Kihei Road. At this point, it connects with the existing 15-inch County sewer line on South Kihei Road.

The design capacity of the Kihei Wastewater Reclamation Facility is 6.0 million gallons per day. The existing average flow to the Kihei Wastewater Reclamation Facility is approximately 4.0 mgd during peak tourist season. If an anticipated flow is calculated based on building permits which have been issued, the cumulative wastewater flow allocated is approximately 5.3 mgd.

Because of concern that the wastewater treatment system was reaching its design capacity, the Maui County Council passed Ordinance Nos. 1787, 1843, and 2022 which allocated remaining capacity to various uses. Although 207,500 gallons per day is allocated for long term residential uses, an allocation of capacity is not ensured at the present time. (As of August 1993, 117,000 gallons per day remained for long-term residential use.)

It is noted that proposed improvements to the Kihei Wastewater Reclamation Facility would increase design capacity to 8.0 mgd. The County also has a sewer impact fee ordinance in effect which covers plant expansion costs and collection system improvements.

An allocation of capacity to the Kihei Wastewater Reclamation Facility will be coordinated with the Department of Public Works and Waste Management as part of the building permit process.

4. ***Drainage***

The proposed drainage plan will consist of an underground drainage collection system, swales and retention/detention basins.

Runoff generated from the project site is proposed to be directed to the existing 8.5 feet by 7 feet culvert at South Kihei Road. Off-site storm runoff generated from the mauka areas of the Kamaole Drainage Basin will be directed through swales into Kamaole Gulch at Kanakanui Road. In addition, it should be noted that playing fields located at the second elementary school site also could serve as retention basins.

The existing storm runoff for the project is computed at approximately 58 cubic feet per second (cfs). The projected runoff for the improved site conditions is approximately 78 cfs for a 10-year recurrence interval and 97 cfs for a 50-year recurrence.

The proposed grading plan will require excavation and embankment for the construction of Road "F", the parking lot and roads for the Kamaole Heights Subdivision. The site will be graded to dispose of on-site storm runoff generated from the proposed improvements. Erosion control measures will be incorporated during the construction period to minimize soil loss.

The proposed grading and drainage plans for this project will be designed to produce no adverse effects by storm runoff to adjacent properties. Drainage improvements and retention basins will be coordinated with the State Historic Preservation Office to ensure preservation of significant archaeological sites. All drainage improvements will conform to County standards and will be coordinated with the County of Maui, Department of Public Works and Waste Management.

Chapter IV

Relationship to Land Use Plans, Policies and Controls

IV. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

A. STATE LAND USE DISTRICTS

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes the four major land use districts in which all lands in the State are placed. These districts are designated "Urban", "Rural", "Agricultural", and "Conservation". Lands involved in the subject project are within the "Urban" and "Agricultural" districts. See Figure 13. The proposed parking lot and most of the Road "F" alignment are located within the "Urban" district. The segment of Road "F" from Kanakanui Road to Piilani Highway is within the Agricultural district. The proposed parking lot and roadway are in keeping with State land use district provisions. The single family residential subdivision is compatible with the "Urban" designation.

B. MAUI COUNTY GENERAL PLAN

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help guide the long-range development of the County. As stated in the Maui County Charter, "The purpose of the General Plan is to recognize and state the major problems and opportunities concerning the needs and the development of the County and the social, economic and environmental effects of such development and set forth the desired sequence, patterns and characteristics of future development".

The proposed action is in keeping with the following General Plan objective and policy:

Objectives:

- To develop a program for anticipating and enlarging the local street and highway systems in a timely response to planned growth.

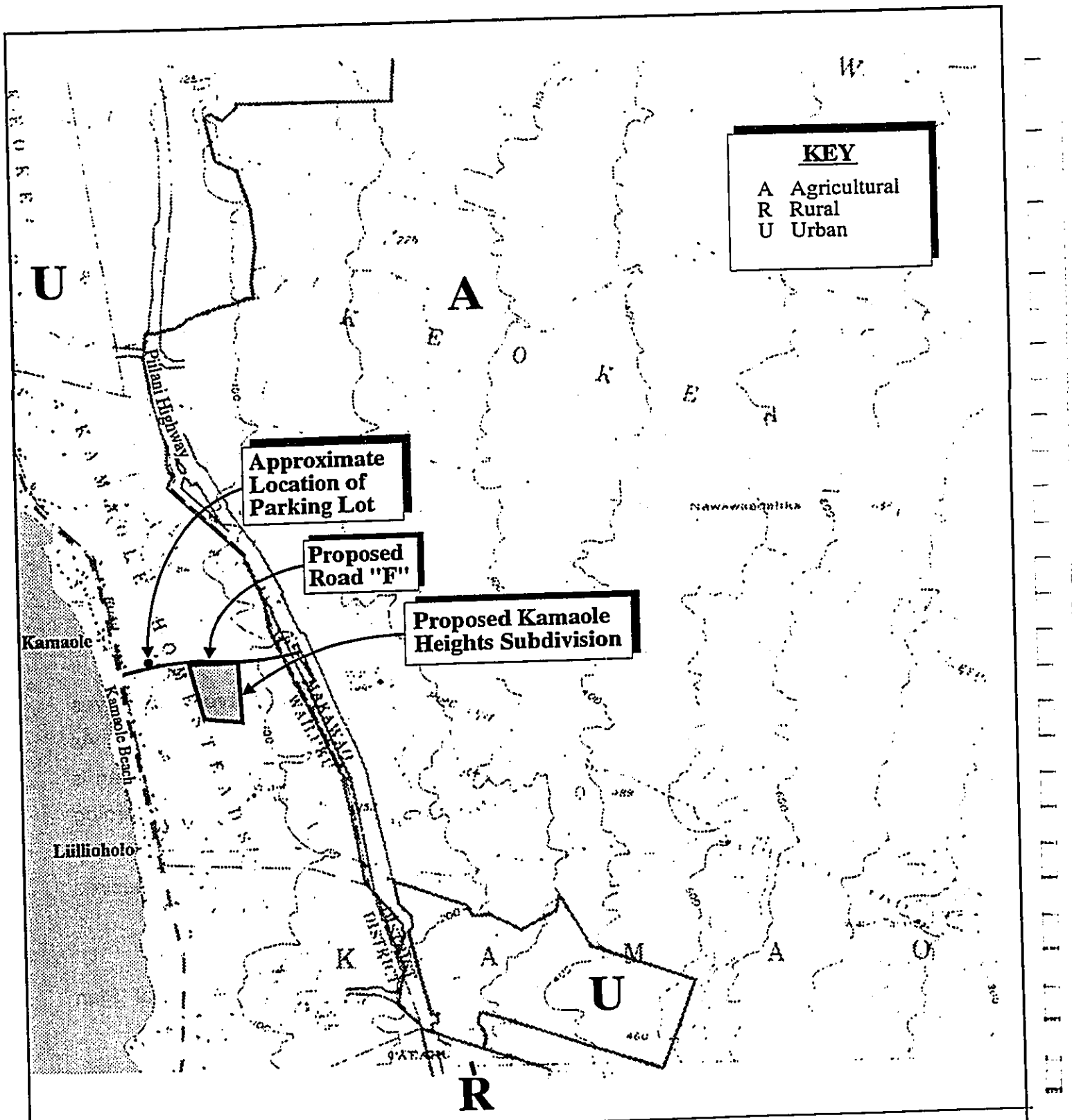

Figure 13 Road "F"/Kamaole Heights
State Land Use Classifications

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

- To provide a choice of attractive, sanitary and affordable homes for all our residents.

Policies:

- Ensure that transportation facilities are anticipated and programmed for construction in order to support planned growth.

- Encourage the construction of housing in a variety of price ranges and geographic locations.

C. *KIHEI-MAKENA COMMUNITY PLAN*

The subject parcel is located in the Kihei-Makena Community Plan region which is one of nine Community Plan regions established in the County of Maui. See Figure 14. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns and characteristics of future development in the region.

Most of the land area involved in the project is designated Single-Family and Hotel. However, the mauka segment of Road "F", from the area around Kanakanui Road to Piilani Highway, is designated Open Space. The proposed project is not contrary to Kihei-Makena Community Plan provisions.

D. *ZONING*

The zoning for the site of the Kamaole Heights Subdivision is R-2 Residential District. The residential subdivision is consistent with the provisions of the zoning. Portions of Road "F", from Kamaole Heights Subdivision to Kanakanui Road would also traverse R-2 Residential

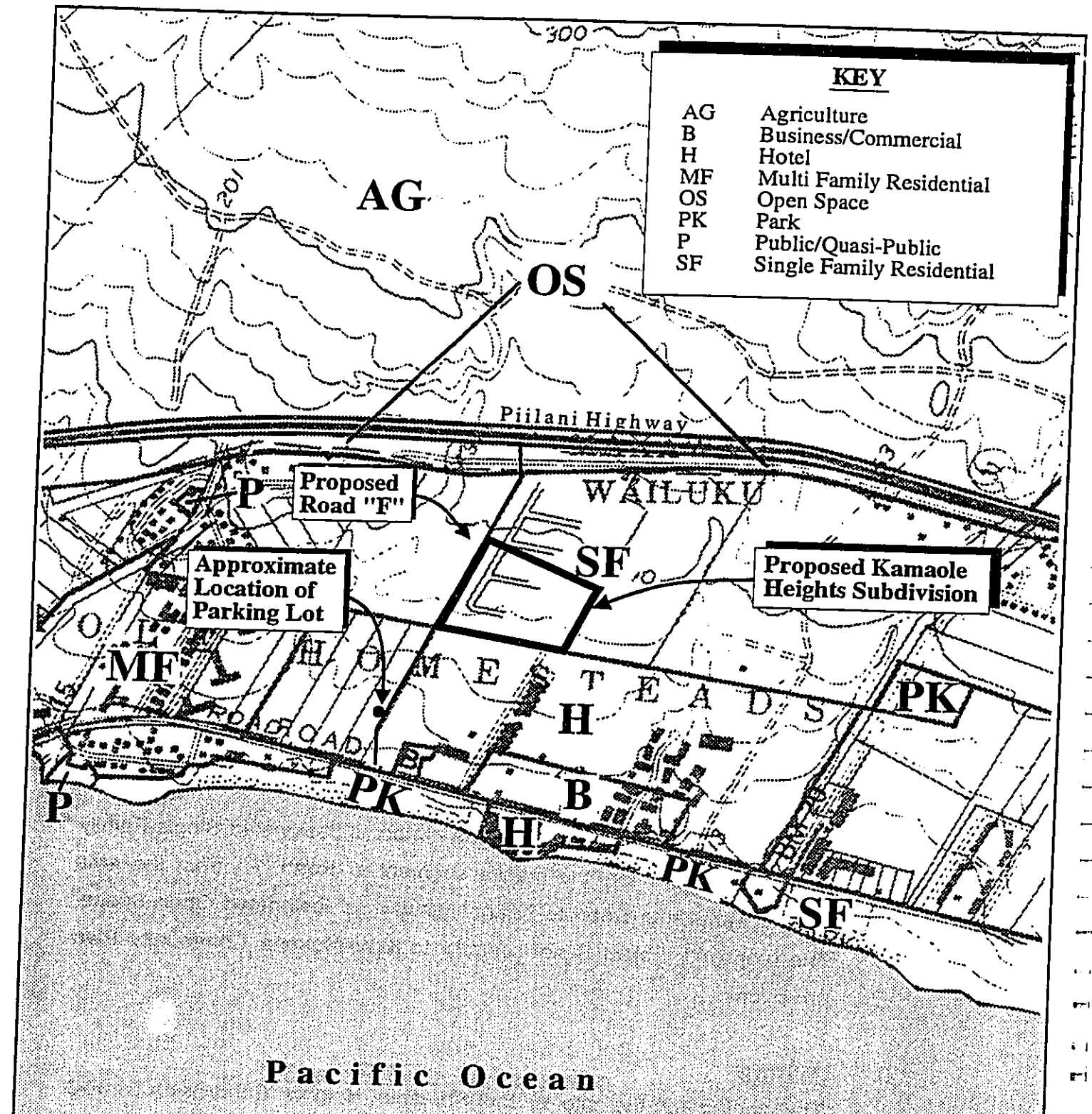

Figure 14 Road "F"/Kamaole Heights
Kihei-Makena Community
Plan Designations

0 500 1000 2000 Feet

Michael T. Munekiyo Consulting, Inc.
Prepared for: KOAHE Limited Partnership

District lands. The mauka portion of the North-South Collector Road is zoned R-2 Residential District while the makai portion is H-M Hotel District. Regarding the remainder of Road "F", the zoning is H-M, Hotel District in the area near the North-South Collector Road. Proceeding makai, the zoning then becomes H-2 Hotel District with H-1 Hotel District lands abutting South Kihei Road. The 24 stall parking lot is located in the H-2 Hotel District. The proposed roadways and parking lot are consistent with the provisions of the zoning.

E. ***KIHEI TRAFFIC MASTER PLAN***

The Kihei Traffic Master Plan, completed in October 1989, was done to provide for traffic management in keeping with projected development in the region. The study focused on major arterials as well as the collector road system in Kihei-Makena. Although only a small portion was formally adopted, the Kihei Traffic Master Plan provides an approach to regional traffic solutions.

Road "F" is a connector road proposed by the Kihei Traffic Master Plan. Major connector roads were envisioned to have a right-of-way between 56 feet to 60 feet.

The proposed project provides an 80 foot right-of-way for Road "F" near the intersections of Piilani Highway, Kanakanui Road and South Kihei Road. Between Kanakanui and South Kihei Roads, the proposed project would involve the construction of Road "F" within an initial 40 foot right-of-way. Should additional development occur on abutting parcels, a right-of-way totalling 80 feet in width could be required.

F. COUNTY OF MAUI SPECIAL MANAGEMENT AREA

The subject property is located within the County of Maui's Special Management Area. Pursuant to Chapter 205A, Hawaii Revised Statutes, and the Rules and Regulations of the Planning Commission of the County of Maui, projects located within the SMA are evaluated with respect to SMA objectives, policies and guidelines. This section addresses the project's relationship to applicable coastal zone management considerations, as set forth in Chapter 205A and the Rules and Regulations of the Maui Planning Commission.

1. Recreational Resources

Objective: Provide coastal recreational resources accessible to the public.

Policies:

a. Improve coordination and funding of coastal recreation planning and management; and

b. Provide adequate, accessible and diverse recreational opportunities in the coastal zone management area by:

(1) Protecting coastal resources uniquely suited for recreation activities that cannot be provided in other areas;

(2) Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites and sandy beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;

(3) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(4) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(5) Encouraging expanded public recreational use of County, State and federally owned or controlled shoreline lands and waters having recreational value;

(6) Adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters; and

(7) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits, and crediting such dedication against the requirements of Section 46-6 of the Hawaii Revised Statutes.

Response: The proposed project is not anticipated to significantly affect existing coastal or inland recreational resources. The construction of Road "F" should provide additional access to South Kihei Road and the shoreline. The proposed 24 stall parking lot on Road "F" is intended for use by beach goers and should ease beach parking congestion.

2. ***Historical/Cultural Resources***

Objective: Protect, preserve and where desirable, restore those natural and man-made historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

1. Identify and analyze significant archaeological resources;

2. Maximize information retention through preservation of remains and artifacts or salvage operations; and

3. Support State goals for protection, restoration, interpretation and display of historic resources.

Response:

The project would involve the preservation in place of a small fishing shrine (Site 2633) of significant cultural value which is located within the Kamaole Heights Subdivision. Another fishing shrine (Site 2637) of cultural value is located on lands outside of the proposed project but on lands owned by KOAHE Limited Partnership. This site is intended to be preserved during future development of that site. Other sites within the project area were considered no longer significant to the interests of historic preservation.

3. *Scenic and Open Space Resources*

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

Policies:

1. Identify valued scenic resources in the coastal zone management area;

2. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural land forms and existing public views to and along the shoreline;

3. Preserve, maintain and, where desirable, improve and restore shoreline open space and scenic resources; and

4. Encourage those developments which are not coastal dependent to locate in inland areas.

Response: The project should have an insignificant impact on coastal scenic and open space resources. The project will be designed and landscaped to assure compatibility with surrounding properties.

4. ***Coastal Ecosystems***

Objective: Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

1. Improve the technical basis for natural resource management;

2. Preserve valuable coastal ecosystems of significant biological or economic importance;

3. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

4. Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate State water quality standards.

Response: Improvements to the subject property are not expected to adversely impact coastal ecosystems. The project does not involve extensive grading. Applicable erosion control measures will be implemented during and after construction.

5. ***Economic Uses***

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

Policies:

1. Concentrate in appropriate areas the location of coastal dependent development necessary to the State's economy;

2. Ensure that coastal dependent development such as harbors and ports, visitor facilities, and energy-generating facilities are located, designed and constructed to minimize adverse social, visual and environmental impacts in the coastal zone management area; and

3. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

   a. Utilization of presently designated locations is not feasible;

   b. Adverse environmental effects are minimized; and

   c. Important to the State's economy.

Response: The project is in keeping with the land use patterns established by the Kihei-Makena Community Plan.

6. ***Coastal Hazards***

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

Policies:

1. Develop and communicate adequate information on storm wave, tsunami, flood, erosion and subsidence hazard;

2. Control development in areas subject to storm wave, tsunami, flood, erosion and subsidence hazard;

3. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

4. Prevent coastal flooding from inland projects.

Response: No significant adverse drainage impacts to downstream properties should result from the proposed project.

7. ***Managing Development***

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

1. Effectively utilize and implement existing law to the maximum extent possible in managing present and future coastal zone development;

2. Facilitate timely processing of application for development permits and resolve overlapping of conflicting permit requirements; and

3. Communicate the potential and short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the general public to facilitate public participation in the planning and review process.

Response: In compliance with the Special Management Area Rules and Regulations of the County of Maui, required documentation will be filed with the County Planning Department and will undergo public hearing and decision by the Maui Planning Commission. In addition, early consultation is provided through the process of preparing the Environmental Assessment. A Draft Environmental Assessment is prepared for public review in compliance with Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, Environmental Impact Statement Rules.

Applicable State and County requirements will be adhered to in the design and construction of the proposed project.

Chapter V

Findings and Conclusion

V. FINDINGS AND CONCLUSION

The proposed project will involve earthwork and building construction activities. In the short term, these activities may create temporary nuisances normally associated with construction activities. However, dust control measures, such as regular watering and sprinkling, will be implemented to minimize wind-blown emissions. All construction activities are anticipated to be limited to normal daylight working hours. A solid waste management plan will be formulated for the disposal of clearing and grubbing material from the site during construction. Impacts generated from construction activities are not considered adverse.

From a long term perspective, the proposed project is not anticipated to result in adverse environmental impacts. A botanical survey for the project found two (2) 'ohai plants on property adjacent to the proposed project. These are considered a Category 1 candidate endangered species which means that there is enough information on biological vulnerability and threats to support a proposal to list it as an endangered or threatened species. Seeds from the 'ohai have been collected and will be distributed to various botanic gardens and arboreta. The use of 'ohai as part of the landscaping plan within the Kamaole Heights Subdivision will also be considered. There are no known significant habitats of rare, endangered or threatened species of fauna or avifauna located on the project site.

The project will also involve the preservation in place of a small fishing shrine. Applicable requirements will be coordinated with the Historic Preservation Division of the Department of Land and Natural Resources. Medical, police, and fire protection services are not expected to be adversely impacted by the project. The project will provide a 24 stall public parking lot approximately 300 feet mauka of South Kihei Road. This is intended to be supplemental parking for beach goers at Kamaole Beach Park I. These improvements will significantly exceed the County's park assessment provisions resulting in park assessment

credits. The landowner for the project, KOAHE Limited Partnership, is currently negotiating with the State of Hawaii on the State's possible purchase of an abutting 12 acre property for a second elementary school in Kihei. This should have significant beneficial impacts upon elementary school education in the region.

Regarding traffic, the implementation of Road "F" should be beneficial on a project specific basis as well as from a regional perspective. However, further detailed study is required during the design stage of development to address specific roadway geometric requirements. Moreover, abutting segments of the North-South Collector Road are being proposed for dedication to the County of Maui. An 8-inch waterline is being extended approximately 2,500 feet from Alaku Road to provide water service to the project. A new 8-inch sewer line is also proposed to link up with the existing County transmission line along South Kihei Road. The proposed drainage plan will consist of an underground drainage collection system, swales and retention/detention basins. Erosion control measures will be incorporated during construction to minimize soil loss. Grading and drainage plans are designed to produce no adverse effects by storm runoff to adjacent properties.

In light of the foregoing findings, it is concluded that the proposed action will not result in any significant impacts.

Chapter VI

Agencies Consulted

VI. AGENCIES CONSULTED

The following agencies were consulted during the preparation of the environmental assessment.

1. State of Hawaii
   Department of Land and
   Natural Resources
   State Historic Preservation
   Division
   1151 Punchbowl Street
   Honolulu, Hawaii 96813

2. State of Hawaii
   Department of Transportation
   Highways Division
   650 Palapala Drive
   Kahului, Hawaii 96732

3. County of Maui
   Department of Public Works
   and Waste Management
   Engineering Division
   200 South High Street
   Wailuku, Hawaii 96793

4. County of Maui
   Department of Parks and
   Recreation
   200 South High Street
   Wailuku, Hawaii 96793

5. County of Maui
   Department of Planning
   250 South High Street
   Wailuku, Hawaii 96793

Chapter VII

Letter Received During Public Comment Period and Agency Response

OCT 2 9 1993

JOHN WAIHEE
GOVERNOR

BRIAN J. J. CHOY
Director

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

October 28, 1993

Mr. George N. Kaya
Director of Public Works & Waste Management
County of Maui
200 South High Street
Wailuku, Hawaii 96793

Dear Mr. Kaya:

Subject: Draft Environmental Assessment for Road "F"/Kamaole Heights, Kihei, Maui

Thank you for the opportunity to review and comment on the subject document. We have the following comment.

Please describe if the project may effect any wetlands or endangered fauna. The U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service may be able to help you in this matter.

If you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

for Brian J. J. Choy
Director

c: KOAHE
MTM

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

December 6, 1993

Brian J.J. Choy, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

SUBJECT: Draft Environmental Assessment for Road "F"/Kamaole Heights

Thank you for your comments of October 28, 1993 pertaining to the subject project. We would like to respond to your comments as follows:

1. Regarding your concern on wetlands, we note that the subject site is not depicted as wetlands on the National Wetlands Inventory Maps done by the U.S. Department of the Interior. Further, there is no evidence of free standing water on the site or existence of plant species which could indicate wetlands on the site.

2. Regarding the impact on fauna, we note that the site is characteristic of urban areas in the general vicinity. Fauna typically found in the vicinity include mongoose, mice, rats, dogs and cats. Avifauna typically include Northern Cardinal, House Finch, and Gray and Black Francolin. There are no rare or endangered species of fauna or avifauna found at the subject site.

We appreciate your input into the EA process. If you have any questions, please feel free to call me.

Very truly yours,

for GEORGE N. KAYA
Director of Public Works &

LL:jc(ED93-1266)
DEAROADF.KH

xc: Everett Dowling, Dowling Company Inc.

References

REFERENCES

Aotani and Associates, Inc., Kihei-Makena Technical Report, County of Maui, prepared for the County of Maui, November 1981.

Austin, Tsutsumi and Associates, Inc., Kihei Traffic Master Plan, October 1989.

Community Resources, Inc., Maui County Community Plan Update Program Socio-Economic Forecast Report, March 1992.

First Hawaiian Bank, Research Department, Supplement to Economic Indicators, July/August 1992.

Fukunaga and Associates, Inc., Final Environmental Impact Statement for the Site Selection for the New Kihei Public Library, June 1991.

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Appendices

Appendix A

Botanical Survey

BOTANICAL SURVEY
KAMA'OLE LAND VENTURES -- VARIOUS PARCELS
MAKAWAO DISTRICT, ISLAND OF MAUI

by

Winona P. Char

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: Michael T. Munekiyo Consulting, Inc.

August 1993

TABLE OF CONTENTS

BOTANICAL SURVEY
KAMA'OLE LAND VENTURES -- VARIOUS PARCELS
MAKAWAO DISTRICT, ISLAND OF MAUI

INTRODUCTION

Five parcels make up the Kama'ole property. They are TMK 3-9-18: 17 and 21; 3-9-20:20 and 27; and 3-9-19:04. The ±55-acre Kama'ole property is bounded by the Maui Coast Hotel and undeveloped lands to the north; Kanakanui Road to the east; the Kihei Ali'i Kai condominiums and undeveloped lands to the south; and on the west by the Kama'ole Beach Club-ABC Store complex and Kihei Road. Elevation ranges from roughly 13 ft. at its makai end (adjacent to Kihei Road) to about 120 ft. at its mauka end by Kanakanui Road. Loose, sandy substrate is found on the lower half of the property (TMK 3-9-18:17 and 21, and 3-9-20:20 and 27), while reddish-colored soil or a sand/soil mix and scattered rocky knolls are found largely on the upper half of the project site. Vegetation on much of the Kama'ole site and on the surrounding undeveloped lands consists of buffel grass with scattered kiawe trees. Evidence of former house sites along with occasional remnant landscape plantings can be found on the lower half of the property.

Field studies to assess the botanical resources found on the project site were made on 11 August 1993. The primary objectives of the survey were to: 1) describe the major vegetation types; 2) inventory the flora; and 3) search for endangered and threatened species protected by Federal and State laws as well as rare and vulnerable plants. A team of two botanists was used to gather the technical data contained in this report.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Tax maps and a blue-line copy of an aerial photograph (1" = 100') were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points. The five parcels which make up the Kama'ole property are all easily accessible from the paved road which runs along the Kihei Ali'i Kai property boundary.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, topography, exposure, drainage, past disturbances, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium (Botany Department, U.H. Manoa -- HAW) and for comparison with the most recent taxonomic literature.

The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual taxa.

DESCRIPTION OF THE VEGETATION

About three-quarters of the property is covered by a buffel grass and kiawe association which is very species poor. Overgrown, disturbed areas now covered by a weedy assortment of plants as well as some remnant cultivated specimens can be found on portions of TMK: 3-9-20:20 and 27, and 3-9-18:17. These overgrown areas once supported homes and other structures. Along the northern

boundary where it adjoins the Maui Coast Hotel, is a drainage area and also a recently bulldozed area which receives runoff from the hotel; the weedy vegetation is dense and forms a green belt along this side of the property.

A more detailed description of the vegetation types on the Kama-'ole property is presented below. A checklist of all the vascular plant species inventoried on the site is presented at the end of the report.

Buffel Grass/Kiawe Association

This vegetation type is common on the dry, lowland, leeward areas of most of the main Hawaiian Islands. On the leeward slopes of Haleakala, Maui, buffel grass and kiawe form the dominant plant cover from about Kealia to Makena (Char 1992a).

The buffel grass/kiawe association is more or less uniform throughout all five of the parcels which make up the project site. Its physiognomy is similar to that of a savanna, that is, it consists of low tussocky mats of buffel grass (*Cenchrus ciliaris*), from 1 to 2 ft. tall, with very scattered trees of kiawe (*Prosopis pallida*). The tree canopy cover is about 3 to 5 percent. Scattered through this vegetation type are shrubs of koa-haole (*Leucaena leucocephala*), 3 to 6 ft. tall. In low-lying areas, the koa-haole shrubs may form small thickets. Other species found occasionally in the buffel grass/kiawe association are 'uhaloa (*Waltheria indica*) and 'ilima (*Sida fallax*). Rocky knolls and outcroppings support a few plants of Natal redtop grass (*Rhynchelytrum repens*), hairy spurge (*Chamaesyce hirta*), and hairy merremia (*Merremia aegyptia*).

Evidence of past fires throughout all of the project site can be found here and there. A 1976 aerial photograph of the project

site shows the upper ±26-acre parcel (TMK 3-9-19:04) with a dense cover of kiawe trees, most of which are now blackened and dead.

Vegetation on Disturbed Areas

Along the northern boundary, adjacent to the Maui Coast Hotel, is a narrow band of greener vegetation on a recently bulldozed road and also in the drainage channel located between the two properties. Runoff from the hotel's sprinkler system supports a large and varied assemblage of mostly weedy plants. These include buffel grass, 'uhaloa, golden crownbeard (Verbesina encelioides), hairy horseweed (Conyza bonariensis), spiny amaranth (Amaranthus spinosus), Eragrostis pilosa, tree tobacco (Nicotiana glauca), lion's-ear (Leonotis nepetifolia), Asiatic butterfly bush (Buddleia asiatica), etc. Blue-haze (Convolvulus mauritanicus), a commonly used plant for ground cover, with fuzzy leaves and bright blue flowers, is also growing onto the project site from the hotel grounds.

Former house sites and other structures can be found on the lower one-quarter of the project site. These show up clearly on the 1976 aerial photograph. In the field, these sites can be identified by the presence of concrete foundations, piles of lumber and other construction materials, and remnant landscape plantings among the buffel grass. These plantings include a white-flowered Bougainvillea, oleander (Nerium oleander), vitex hedges (Vitex trifolia), monkeypod (Samanea saman), milo (Thespesia populnea) and kou (Cordia subcordata) trees, coconut (Cocos nucifera), and horseradish tree (Moringa oleifera). A large orchard of mango trees (Mangifera indica) is found near the ABC Store. Surprisingly, two plants of the tree 'ohai (Sesbania tomentosa forma arborea) are found near one of the house sites -- see "Endangered Plants" section below for discussion.

ENDANGERED PLANTS

Two individuals of the tree 'ohai (Sesbania tomentosa forma arborea), each about 10 ft. tall, are found near the vitex hedges and a golden shower tree (Cassia fistula) on parcel TMK 3-9-20:20 (Figure 1). The tree 'ohai is native only to the Hawaiian Islands, where the largest populations are found on the slopes above Kaunakakai, Moloka'i (Char 1983). Recently, a few plants have been recorded from the lower slopes of Lihau, West Maui, and at Kanaio on Pimoe cinder cone, East Maui. It is considered a Category 1 candidate endangered species, that is, there is enough information on biological vulnerablity and threats to support a proposal to list it as an endangered or threatened species (U.S. Fish and Wildlife Service 1990).

However, the location of the two plants on the project site would indicate that the plants may represent a former landscape planting or the like. From the 1976 aerial photograph, it appears that the plants are located in the area around two large homes. Besides the presence of nearby landscape plantings such as the vitex hedge and golden shower tree, there is also a white PVC waterline about 10 to 12 ft. from the 'ohai plants. The two plants are of the same age and size class with no smaller plants or seedlings present. In other words, it does not appear to be a natural population.

Voucher specimens were taken and the material will be deposited at the Bishop Museum for reference. Seeds collected from the two plants will be sent to the Hawai'i Plant Conservation Center/ National Tropical Botanical Garden for distribution to various botanic gardens and arboreta in the Hawaiian Islands, thus, preserving this population's gene pool. The two plants have been flagged with blue and pink flagging.

DISCUSSION AND RECOMMENDATIONS

With the exception of the two tree 'ohai plants, there is very little of botanical interest or concern on the project site. The buffel grass/kiawe association which covers the majority of the property is the characteristic vegetation type found on the dry, lowland, leeward slopes of Haleakala (Wagner et al. 1990; Char 1992a, 1992b). The plants found on the disturbed areas are largely weedy species or remnant landscape plantings marking former house sites. Of a total of 63 plants inventoried, 57 (91%) are introduced or alien; 2 (3%) are originally of Polynesian introduction; and 4 (6%) are native. Of the natives, only the tree 'ohai is endemic, that is, it is native only to the Hawaiian Islands. The other 3 species are indigenous, i.e. they are native throughout the Pacific including Hawai'i. None of the plants are listed or proposed endangered and threatened species (U.S. Fish and Wildlife Service 1989, 1990, 1992).

While the tree 'ohai is a high priority candidate endangered species, its presence on the site as a naturally occurring population is questionable. It is found in a disturbed area with remnant landscape plantings and former house sites. The various 'ohai taxa are popular native plants for landscaping and are available from several plant nurseries (Hawai'i Plant Conservation Center 1992).

The proposed development of the site is not expected to have a significant negative impact on the botanical resources as the site is dominated primarily by introduced plants such as buffel grass and kiawe. Seeds from the 'ohai have been collected and will be distributed to various botanic gardens and arboreta. If feasible, additional seeds should be collected and the plants started from these seeds could be used in landscaping the

elementary school site proposed for the ±26-acre parcel. The Honolulu office of the U.S. Fish and Wildlife Service has been informed of the location and status of the two 'ohai plants as well as the proposed mitigation measures.

PLANT SPECIES LIST -- Kama'ole Parcels

A checklist of all those vascular plant species inventoried on the five Kama'ole parcels during the field studies is presented below. The plants are arranged alphabetically by family within each of two groups: Monocots and Dicots. The taxonomy and nomenclature of the flowering plants, Monocots and Dicots, are in accordance with Wagner et al. (1990), for the most part. Where non-adventive, cultivated species are listed, the names follow St. John (1973).

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:
   E = endemic = native only to the Hawaiian Islands
   I = indigenous = native to the Hawaiian islands and also elsewhere to the Pacific
   P = Polynesian = plants originally of Polynesian introduction prior to Western contact (Cook's discovery of the islands in 1778); not native
   X = introduced or alien = all those plants brought by humans to the islands after Western contact; not native.
4. Presence(+) or absence (-) of a particular species within each of three vegetation types recognized on the subject parcels (see text for discussion):
   1 = Buffel Grass/Kiawe Association
   2a = Disturbed Vegetation -- North Boundary
   2b = Disturbed Vegetation -- Old House Sites

Scientific name	Common name	Status	Vegetation type 1	2a	2b
FLOWERING PLANTS					
MONOCOTS					
ARECACEAE (Palm Family)					
Cocos nucifera L.	coconut, niu	P	-	-	+
POACEAE (Grass Family)					
Cenchrus ciliaris L.	buffel grass	X	+	+	+
Chloris barbata (L.) Sw.	swollen finger grass, mau'ulei	X	-	+	-
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X	-	+	-
Echinochloa colona (L.) Link	jungle rice	X	-	+	-
Eleusine indica (L.) Gaertn.	wiregrass, goosegrass	X	+	-	-
Eragrostis pilosa (L.) P. Beauv.		X	-	+	-
Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult.	lovegrass	X	-	+	-
Panicum maximum Jacq.	Guinea grass	X	-	+	-
Panicum maximum var. trichoglume Eyles ex Robyns	green panicgrass	X	-	+	-
Rhynchelytrum repens (Willd.) Hubb.	Natal redtop	X	+	+	-
DICOTS					
AMARANTHACEAE (Amaranth Family)					
Amaranthus spinosus L.	spiny amaranth, pakai kuku	X	-	+	-
ANACARDIACEAE (Mango Family)					
Mangifera indica L.	mango, manako	X	-	-	+
Schinus terebinthifolius Raddi	Christmas berry	X	-	-	+
APOCYNACEAE (Periwinkle Family)					
Nerium oleander L.	oleander, 'oleana	X	-	-	+

Scientific name	Common name	Status	Vegetation type 1	2a	2b
ASCLEPIADACEAE (Milkweed Family)					
Asclepias curassavica L.	butterfly weed, laulele	X	-	-	+
Calotropis gigantea (L.) W.T. Aiton	crown flower, puakalaunu	X	-	-	+
ASTERACEAE (Sunflower Family)					
Bidens pilosa L.	Spanish needle, beggar's tick, ki	X	-	+	-
Conyza bonariensis (L.) Cronq.	hairy horseweed, 'ilioha	X	-	+	-
Crassocephalum crepidioides (Benth.) S. Moore	crassocephalum	X	-	+	-
Pluchea indica (L.) Less.	Indian pluchea	X	-	+	+
Tridax procumbens L.	coat buttons	X	-	-	+
Verbesina encelioides (Cav.) Benth. & Hook.	golden crown-beard	X	+	+	+
Youngia japonica (L.) DC.	oriental hawksbeard	X	-	+	-
BIGNONIACEAE (Bignonia Family)					
Spathodea campanulata P. Beauv.	African tulip tree	X	-	-	+
BORAGINACEAE (Borage Family)					
Cordia subcordata Lam.	kou	P	-	-	+
BUDDLEIACEAE (Butterfly Bush Family)					
Buddleia asiatica Lour.	Asiatic butterfly bush, huelo-'ilio	X	-	+	-
CAPPARACEAE (Caper Family)					
Cleome gynandra L.	wild spider flower, hohohina	X	-	+	+
CASUARINACEAE (Ironwood Family)					
Casuarina equisetifolia L.	ironwood, paina	X	-	-	+
CHENOPODIACEAE (Goosefoot Family)					
Chenopodium carinatum R. Br.	keeled goosefoot	X	+	+	-
Chenopodium murale L.	nettle-leaved goosefoot, 'aheahea	X	+	+	+

Scientific name	Common name	Status	Vegetation type 1	2a	2b
CONVOLVULACEAE (Morning-glory Family)					
Convolvulus mauritanicus Boiss.		X	-	+	-
Ipomoea triloba L.	little bell, pink bindweed	X	-	-	+
Merremia aegyptia (L.) Urb.	hairy merremia, koali kua hulu	X?	+	+	-
CUCURBITACEAE (Squash Family)					
Cucumis dipsaceus Ehrenb. ex Spach	spiny cucumber, hedgehog gourd, wild cucumber	X	-	+	-
EUPHORBIACEAE (Spurge Family)					
Chamaesyce hirta (L.) Millsp.	hairy spurge	X	+	+	-
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	X	-	+	-
Chamaesyce prostrata (Aiton) Small	prostrate spurge	X	-	+	-
Ricinus communis L.	castor bean, koli	X	-	+	-
FABACEAE (Pea Family)					
Cassia fistula L.	golden shower	X	-	-	+
Crotalaria incana L.	fuzzy rattlepod, kukaehoki	X	-	+	-
Crotalaria pallida Aiton	smooth rattlepod, pikakani	X	-	+	+
Desmanthus virgatus (L.) Willd.	slender mimosa	X	+	-	-
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	X	-	+	+
Leucaena leucocephala (Lam.) de Wit	koa-haole	X	+	+	+
Macroptilium lathyroides (L.) Urb.	cow pea, wild bushbean	X	-	+	-
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X	+	+	+
Samanea saman (Jacq.) Merr.	monkeypod	X	-	-	+
Sesbania tomentosa Hook. & Arnott	'ohai (arborea type)	E	-	-	+
LAMIACEAE (Mint Family)					
Leonotis nepetifolia (L.) R. Br.	lion's-ear	X	-	+	-
MALVACEAE (Hibiscus Family)					
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	X	-	+	-
Malvastrum coromandelianum (L.) Garcke	false mallow, hauuoi	X	-	+	+
Sida fallax Walp.	'ilima	I	+	+	+
Sida rhombifolia L.	Cuba jute	X	-	+	-

Scientific name	Common name	Status	Vegetation type 1	2a	2b
Thespesia populnea (L.) Sol. ex Correa	milo	I?	-	-	+
MORINGACEAE (Moringa Family)					
Moringa oleifera Lam.	horseradish tree, kalamungai	X	-	-	+
MYRTACEAE (Myrtle Family)					
Syzygium cumini (L.) Skeels	Java plum	X	-	-	+
NYCTAGINACEAE (Four-o'clock Family)					
Bougainvillea hybrid	white-flowered bougainvillea	X	-	-	+
PORTULACACEAE (Purslane Family)					
Portulaca oleracea L.	pigweed, common purslane	X	+	+	+
SOLANACEAE (Tomato Family)					
Datura stramonium L.	Jimson weed, la'au hano	X	-	+	-
Nicotiana glauca R.C. Graham	tree tobacco	X	-	+	-
STERCULIACEAE (Cacao Family)					
Waltheria indica L.	'uhaloa, hi'aloa, kanakaloa	I?	+	+	+
VERBENACEAE (Verbena Family)					
Vitex trifolia var. subtrisecta (Ktze.) Mold.	vitex, polinalina	X	-	-	+

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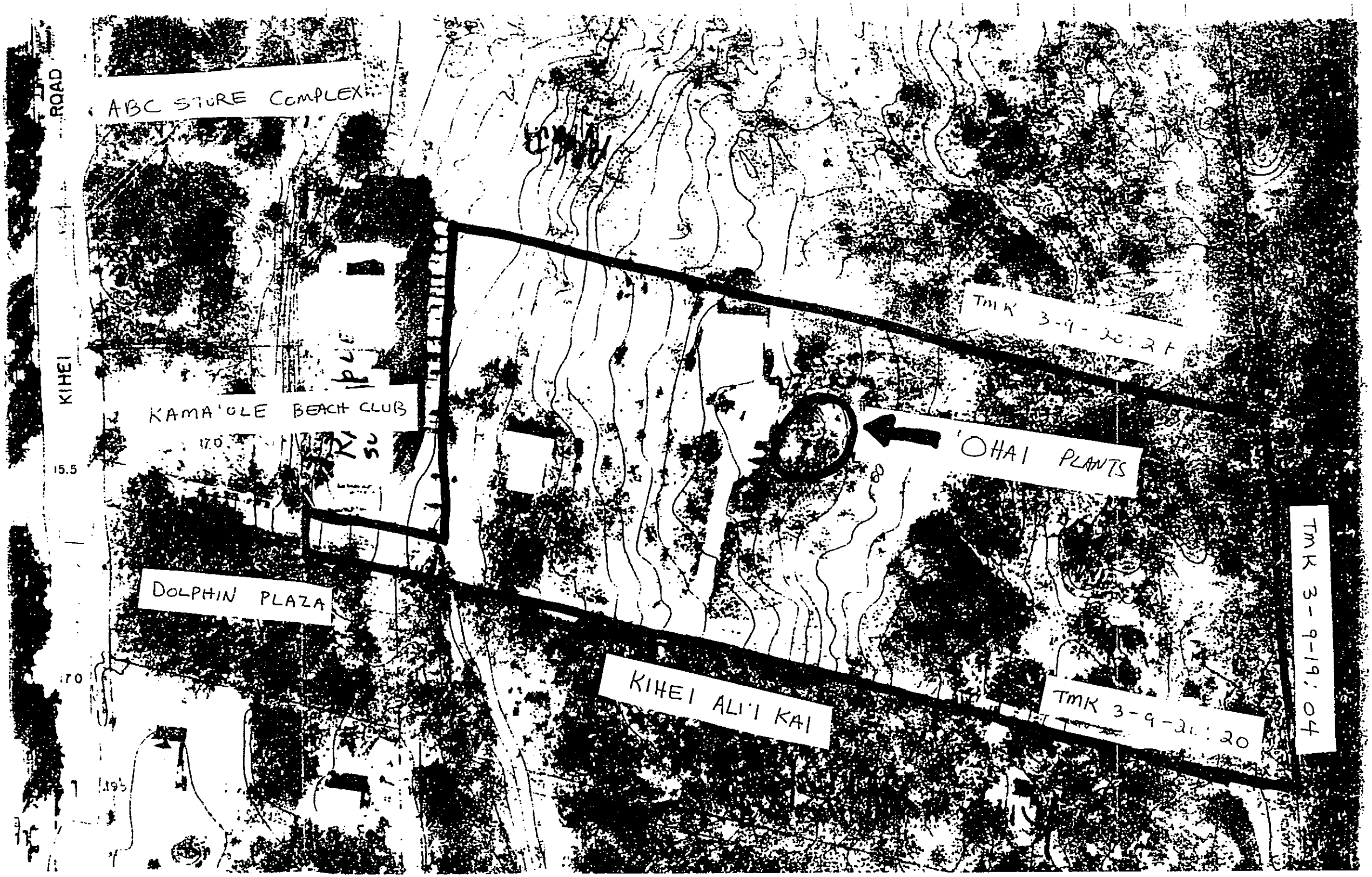
FIGURE 1. Approximate location of two tree 'ohai plants on the project site. 1976 aerial photo base; scale: 1"=100'. Note presence of house sites in photo.

DOCUMENT CAPTURED AS RECEIVED



Appendix B

Letter dated December 18, 1992 from SHPD to Cultural Surveys Hawaii

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

December 18, ~~1992~~ 1992

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCE

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
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CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

LOG NO.: 6683
DOC NO.: 9212AG33

Mr. David W. Shideler
Cultural Surveys Hawaii
733 North Kalaheo Avenue
Kailua, Hawaii 96734

Dear Shideler:

SUBJECT: Historic Preservation Review of an Archaeological Report
Kama'ole, Wailuku, Maui
TMK: 3-9-19:6; 3-9-20: 20, 27

Thank you for the opportunity to review and comment on your report entitled Archaeological Survey and Testing of a 54-Acre Parcel at Kama'ole, Wailuku district, Island of Maui (1992). We apologize for the delay of this response.

This report appears to have adequately presented the results of the background research, testing and data analyses. We have only two minor comments:

1) There is typographical error on page 44. Site 2737 should be changed to 2637.

2) Under SUMMARY AND RECOMMENDATIONS (page 46), we disagree that all five tested sites are no longer significant. We agree with this determination only for sites 2632, 2634 and 2635. Although no burials were found in sites 2633 and 2637, the religious function (fishing shrines) assigned to these sites means that they are still significant for their cultural value. Since the developer has agreed to preserve these sites, we concur that no additional archaeological research is necessary.

Please revise pages 44 and 46 and send them to our office for replacement of these pages of our review copy.

Please call Annie Griffin at 587-0013 if you have any questions about these comments.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

AG:aal

DEC 18 1992

Appendix C

Traffic Impact Assessment

THE TRAFFIC MANAGEMENT CONSULTANT
Randall S. Okaneku, P. E., Principal • 1188 Bishop Street • Suite 1907 • Honolulu, Hawaii 96813
Telephone: (808) 536-0223 • Facsimile: (808) 537-2985

August 27, 1993
Job. No. 9319

Dowling Company, Inc.
c/o Michael T. Munekiyo Consulting, Inc.
1823 Wells Street, Suite 3
Wailuku, Maui, Hawaii 96793
Attention: Mr. Milton Arakawa

Gentlemen:

Subject: Road "F" and Kamaole Heights Subdivision, TMK 3-9-91: Portion of 6

The Traffic Management Consultant is pleased to present this preliminary traffic assessment for the proposed Road "F" and Kamaole Heights Subdivision The purpose of this assessment is to determine the level significance of any traffic impacts resulting from the proposed project. The scope of this study includes: a description of the proposed project; an assessment of existing roadway and traffic conditions; and the development trip generation characteristics for the proposed project.

Project Description

The proposed project would consist of 62 single family residential subdivision in Kihei, Maui, Hawaii. The 11.256 acre site is identified as Tax Map Key 3-9-91: Portion of 6. The site is located mauka (east) of Kamaole Beach #1. However, road access to the proposed subdivision does not currently exist. The project site is located approximately 1,200 feet mauka of South Kihei Road, and about 650 feet makai of Piilani Highway.

A new roadway is proposed to be constructed between South Kihei Road and Piilani Highway to provide project access. The proposed roadway is identified as Road "F" in the County's Kihei Traffic Master Plan. Road "F" has also been included in the proposed Kihei-Makena Community Plan update. A 24 stall parking lot is also planned along Road "F" to provide additional off street parking for Kamaole Beach Park #1.

Half the ultimate 80 foot-wide right-of-way roadway would be constructed between the subdivision and the proposed parking lot. The 40 foot-wide right-of-way roadway would consist of 26 foot-wide travelway and 8 foot-wide sidewalk on the south side of the road and 6 foot-wide shoulder on the north side of the road. The 80 foot-wide

right-of-way Road "F" would be constructed between South Kihei Road and the proposed parking lot and between the subdivision and Piilani Highway. The full-width Road "F" would consist of two 26 foot-wide travelways, a 12 foot-wide raised median, and 8 foot-wide sidewalks on both sides of the roadway. Fully-channelized intersections would be constructed on Road "F" at Piilani Highway, Kanakanui Road, and South Kihei Road.

Existing Conditions

Roadways

Piilani Highway is a high quality, two lane, two way major arterial highway spanning the length of Kihei, from North Kihei Road to Wailea. Piilani Highway is situated on the east side of the Kihei region. The posted speed on Piilani Highway in the project vicinity is 55 miles per hour (mph).

South Kihei Road is a two way minor arterial roadway, also spanning the length of Kihei along the coastline. The posted speed on South Kihei Road in the project vicinity is 30 mph.

Access between Piilani Highway and South Kihei Road in the project vicinity is providing by two roadways. Kanani Road is a mauka-makai collector roadway between Piilani Highway and South Kihei Road, located to the north of the project site. Located to the south of the project site, Keonekai Road also is a mauka-makai collector roadway between Piilani Highway and South Kihei Road.

Kanakanui Road is a narrow two way roadway between Kanani Road and Keonekai Road, located just makai and parallel to Piilani Highway.

Traffic

Traffic count data were obtained from the State Department of Transportation, taken in May 1991. In the project vicinity, Piilani Highway carries about 15,800 vehicles per day. South Kihei Road carries between 14,000 and 17,000 vehicles per day. In the north-south directions, both roadways carry a total of about 2,200 vehicles per hour (vph) during the AM peak hour, and about 2,800 vph during the PM peak hour. In the mauka-makai directions, Kanani Road and Keonekai Road combine to carry about 9,100 vehicles per day; about 560 vph during the AM peak hour and 800 vph during the PM peak hour.

Trip Generation

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation", 5th Edition, 1991. ITE trip rates are developed by correlating the vehicle trip generation data with various land use characteristics, such as vehicle trips per dwelling unit.

The trip generation characteristics are based upon 62 single family residential dwelling units. The trip generation characteristics are shown in Table 1.

Table 1. Trip Generation Characteristics

Land Use = 62 Single Family Dwelling Units			Trip Rates	Vehicle Trips
Peak Hour of Adjacent Street Traffic	AM Peak Hour	Enter	0.22	14
		Exit	0.64	39
		Total	0.86	53
	PM Peak Hour	Enter	0.74	46
		Exit	0.40	25
		Total	1.13	71

During the AM peak hour, the proposed subdivision is expected to generate a total of 53 vph, 14 vph entering the site and 39 vph exiting the site. During the PM peak hour, the project is expected to generate a total of 71 vph, 46 vph entering the site and 25 vph exiting the site.

The off street parking lot is intended to provide additional parking for Kamaole Beach Park #1. Based upon trip generation rates developed by ITE for County parks and published in "Trip Generation", 4th Edition, 1987, the parking lot is expected to generate about 130 vehicles per day, 2 vph during the AM peak hour, and 5 vph during the PM peak hour.

Non-Site Traffic

Non-site traffic consists of future developments in the study area and through traffic utilizing Road "F". Other developments along the proposed Road "F" include what was formerly known as the Kamaole Land Venture Hotel and Residential Complex. The proposed subdivision is part of that 54 acre property. The master plan for the remainder of the property is being revised at this writing.

The Kamaole Homestead Subdivision is 24 acre parcel located immediately to the north of the proposed project. The full build-out and occupancy of the 98 lot residential subdivision have not been determined at this writing.

The proposed Kihei II Elementary School site is located immediately mauka of the subject subdivision. The school site is located on the south side of the proposed Road "F", between the proposed subdivision and Kanakanui Road. The projected enrollment for the new elementary school is between 800 and 1,000 students. The school is expected to open in September, 1996.

Road "F", as proposed in the Kihei Traffic Master Plan, is intended to improve the mauka-makai access between Piilani Highway and South Kihei Road. A portion of the traffic demand, currently using Kanani Road and Keonekai Road for access between Piilani Highway and South Kihei Road, is expected to be diverted to Road "F". Road "F" would reduce the traffic demands on the existing mauka-makai roadways.

Findings

The traffic generated by the proposed residential subdivision represents about 2.5% existing AM and PM peak hour traffic volumes on Piilani Highway and South Kihei Road. Road "F" is consistent with the County's Kihei Traffic Master Plan and the draft of the Kihei-Makena Community Plan update. Road "F" would improve the overall traffic circulation by providing direct access between South Kihei Road and Piilani Highway in the Kamaole area.

Further study is required to determine the cumulative impacts of traffic on Road "F". The specific traffic requirements at the South Kihei Road, Kanakanui Road, and Piilani Highway intersections along the proposed Road "F" would be determined, based upon the projected traffic demands. A traffic study, addressing these issues, should be prepared at the design stage of development.

If you require clarification on any of the above material or have any questions, please do not hesitate to call me.

Very Truly Yours,
The Traffic Management Consultant

By **Randall S. Okaneku, P. E.**
Principal

Appendix D

Drainage Report

PRELIMINARY ENGINEERING REPORT

FOR

ROAD "F" AND THE KAMA'OLE HEIGHTS SUBDIVISION

KAMA'OLE, WAILUKU (KIHEI), MAUI, HAWAII

TMK: 3-9-18:17 & 21
3-9-19:6
3-9-20:20 & 27

Prepared for

KOAHE LIMITED PARTNERSHIP

Prepared by

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
Engineers * Surveyors
Wailuku * Hilo * Honolulu, Hawaii

October 1993

TABLE OF CONTENTS

AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS • SURVEYORS
CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

TED S. KAWAHIGASHI, P.E.
GEORGE M. NEUFFER, P.E.
KENNETH K. KUROKAWA, P.E.
THOMAS S. OTAGURO
IVAN K. NAKATSUKA, P.E.

KEN K. KUROKAWA P.E
Vice President &
Maui Branch Office Manager

PRELIMINARY ENGINEERING REPORT

FOR

ROAD "F" AND THE KAMA'OLE HEIGHTS SUBDIVISION

I. INTRODUCTION

The purpose of this report is to summarize the proposed civil engineering design for Road "F" and Kama'ole Heights Subdivision. It evaluates the existing conditions and defines the drainage, water and sewerage requirements for the project.

II. PROPOSED PROJECT

A. LOCATION

The project site is located in Kihei on the island of Maui. It is located across of Kama'ole Beach Park No. I and is situated between South Kihei Road and Kanakanui Road. The site encompasses 53.90 acres and is designated by Tax Map Key Numbers 3-9-18: 17 and 21, 3-9-19:6, 3-9-20: 20 and 27. Refer to Exhibits 1 and 2 for the location of the project.

B. PROJECT

The proposed project consists of Road "F", a parking lot and a subdivision. Road "F" is a major mauka/makai connector road described in the "Kihei Traffic Master Plan" (dated October 1989) of the County of Maui. Improvements for Road "F" includes a 2 lane roadway with all appurtenant utilities, that connects South Kihei Road to Piilani Highway. A 24-stall beach parking lot is proposed for

REPLY TO:
1871 WILI PA LOOP, SUITE A
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WAILUKU, MAUI, HAWAII • HILO, HAWAII

providing additional public parking for Kama'ole Beach No. 1. The Kama'ole Heights Subdivision is a zero lot line residential subdivision consisting of 62 lots. Refer to Exhibit 3 for the proposed development.

III. EXISTING CONDITIONS

A. TOPOGRAPHY AND SOIL CONDITIONS

The project site generally slopes away from Kanakanui Road towards South Kihei Road. Onsite elevations range from 120 feet to 10 feet MSL (mean sea level). The project area is presently overgrown with grass and kiawe trees.

The soil classifications for this area are Puuone Sand (PZUE) and Jaucas Sand (JaC) as described by the USDA Soil Conservation Service ("Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai"). Puuone sand is characterized as having a rapid permeability above the cemented layer with slow runoff and a moderate to severe hazard of wind erosion. The Jaucas sand is characterized as having a rapid permeability with a very slow to slow runoff and wind erosion being a severe hazard.

B. DRAINAGE

The project site is primarily located within the Kama'ole Gulch Drainage Basin. The Kama'ole Gulch Drainage Basin encompasses approximately 660 acres of area mauka of Piilani Highway and 110 acres of area makai of Piilani Highway for a total of 770 acres. Approximately 48 acres of the project site is located within the makai area of the drainage basin. Refer to Exhibit 4.

Three culvert crossings above the project site intercept storm runoff from the mauka areas of the drainage basin. The first culvert crossing located at Piilani Highway just mauka of the project site consists of three 36-inch diameter corrugated metal pipes. The second culvert crossing (Kama'ole Gulch) located north of the project site at Piilani Highway consists of two 96-inch diameter corrugated metal pipes. A third culvert crossing, located at Kanakanui Road just below the 96-inch diameter culverts, consists of a 48-inch diameter corrugated metal pipe.

Storm runoff for the Kama'ole Drainage Basin converges at a two 72-inch diameter culvert system at the Maui Coast Hotel. It then discharges into a 8.5-foot X 7-foot metal culvert that crosses under South Kihei Road at the northwest corner of the project site. An underground drainage collection system fronting the project site along South Kihei Road connects to the outlet of the 8.5-foot X 7-foot culvert. The runoff from the culvert and the underground collection system discharges to the ocean via an existing concrete lined channel. Refer to Exhibit 5.

Design storm runoff flows for areas mauka of Piilani Highway were determined in the "Hydrology Report for Piilani Highway" prepared for the Department of Transportation by Trans-Meridian Engineers and Surveyors, Inc. The 50-year recurrence interval storm runoff flow for tributary areas 21, 22 and 22A, as shown on Exhibit 4 were computed at 389 cfs, 363 cfs and 91 cfs, respectively.

The existing 100-year recurrence interval storm runoff for the entire 770-acre drainage basin area is approximately 823 cfs.

C. FLOOD ZONE

The Flood Insurance Rate Map (FIRM) for the area indicates that most of the site lies within Zone C, which is an area of minimal flooding. A small portion of the northwestern corner of the site along Kama'ole Gulch lies within Zone A5 and B. The Flood Insurance Rate Map describes Zone A5 as areas of 100-year flood and Zone B as areas between limits of the 100-year flood and 500-year flood. Refer to Exhibit 6.

D. WATER

At present, there are four existing County waterlines within the vicinity of the project site. 1) A 6-inch cast iron waterline along South Kihei Road. 2) A 16-inch cast iron waterline across the mauka boundaries of TMK: 3-9-18: 17 and 21 and 3-9-20:27, which is along the alignment of this proposed North South Connector Road. 3) A 30-inch ductile iron transmission line along Kanakanui Road. 4) A 12-inch waterline along the southern boundary of TMK: 3-9-20:20. Standpipe number 69 is located on South Kihei Road, adjacent to Kama'ole Beach Park No. 1. Three fire hydrants are located along the southern boundary of TMK: 3-9-20:20. Refer to Exhibit 5.

E. SEWERAGE

Presently, an existing 15-inch gravity sewerline and a 16 inch force main is

located along South Kihei Road. Sewer Pump Station No. 7 is located just south of the project site. Refer to Exhibit 5.

IV. PROPOSED IMPROVEMENTS

A. GRADING PLAN

The proposed grading plan will require excavation and embankment for the construction of Road "F", the parking lot and roads for the Kama'ole Heights Subdivision. The site will be graded to dispose of the onsite storm runoff generated from the proposed improvements as shown on Exhibit 7 (Preliminary Grading and Drainage Plan). Erosion control measures will be incorporated during the construction period to minimize soil loss.

B. DRAINAGE PLAN

The proposed drainage plan will consist of underground drainage collection systems, swales, a retention basin on the school site and a temporary detention basin below the proposed parking lot. Runoff generated from the project site will be directed to the existing 8.5-foot X 7-foot culvert at Kihei Road. The offsite storm runoff generated from the mauka areas of the basin will be directed through swales into Kama'ole Gulch at Kanakanui Road.

C. HYDROLOGY

The Rational Method as described in the "Storm Drainage Standards", May 1988, by the City and County of Honolulu was used in calculating the onsite storm runoff. The Soil Conservation Service (SCS) method was used in calculating the

offsite storm runoff. Calculations for offsite runoff is based on a 100-year storm recurrence interval and calculations for onsite runoff is based on a 10-year and 50-year recurrence interval. The rainfall intensity was interpolated from the "Rainfall Frequency Atlas of the Hawaiian Islands", by the U.S. Department of Commerce, Weather Bureau.

The existing onsite storm runoff for the project is computed at approximately 58 cfs. The projected runoff for the improved site conditions is approximately 78 cfs for a 10-year recurrence interval and 97 cfs for a 50-year recurrence. See Appendix for site drainage calculations.

D. WATER PLAN

Water service for areas below the North-South Collector Road will be provided by the existing 16-inch waterline. Water service for Kama'ole Heights Subdivision will be provided by a proposed offsite waterline on Kanakanui Road which will connect from the existing County water system at Alaku Place. The project waterline will provide fire flow to meet the requirements set forth by the Department of Water Supply.

The design criteria for the system is based upon standards set forth by the Department of Water Supply as follows:

Domestic Consumption (Average Daily Demand)

Single Family	600 Gals/Unit

Fire Flow Requirements

Single Family 1,000 GPM for a 2-hour duration

Demand Factors

Maximum Daily Demand = 1.5 X Average Day

Peak Hour = 3.0 X Average Day

The water requirements for the Kama'ole Heights Subdivision are as follows:

Average Daily Demand = 600 Gals/Unit X 62 = 37,200 GPD

Maximum Daily Demand = 55,800 GPD

Peak Hour Flow = 111,600 GPD

Although there are no immediate plans for developing the areas adjacent to Road"F" and Kama'ole Heights Subdivision, it is estimated that the average daily demand based on the current zoning of hotel, and a future school will be approximately 479,400 GPD.

The design criteria are as follows:

Domestic Consumption

Hotel 17,000 Gals/Acre

School 60 Gals/Student

Fire Flow Requirements

Hotel 2,000 GPM for a 2-hour duration

The water requirements are:

Average Daily Demand

Hotel (25.2 Acres)	428,400 GPD
School (850 Students)	51,000 GPD

Construction plans and calculations for the proposed development will be submitted to the Department of Water, County of Maui, for approval.

E. SEWERAGE PLAN

The proposed project site will be serviced by the 15-inch County sewerline on South Kihei Road. A proposed sewerline will be constructed and located on Road "F" to service Kama'ole Heights Subdivision.

The design criteria for the proposed system is based upon "Design Standards of the Department of Wastewater Management". The average wastewater flow for Kama'ole Heights Subdivision is 19,840 GPD and is based upon an average per capita wastewater flow of 80 GPD and four persons per home (lot).

Although there are no immediate plans for developing the areas adjacent to Road "F" and the Kama'ole Heights Subdivision, it is estimated that the average wastewater flow, based on the current zoning of hotel and a future school, will be approximately 165,800 GPD. The design criteria is as follows:

Design Criteria

Hotel (900 rooms)	80 GPCD (2 Persons per Room)
School (850 Students)	25 GPCD

Construction plans and calculations for the proposed development will be submitted to the Department of Public Works and Waste Management, County of Maui, for approval.

V. CONCLUSION

The proposed grading and drainage plans for this project will be designed to produce no adverse effects by storm runoff to adjacent properties. All drainage improvements will conform to the County Standards and will be coordinated with the Department of Public Works and Waste Management, County of Maui.

Water and sewer systems will be designed in accordance to the requirements of the Department of Water Supply, State Department of Health, Department of Public Works and Waste Management.

SCS-ENG-319
Rev. 1-70
File Code ENG-13-14

HYDROGRAPH COMPUTATION

DATE 10/93
COMPUTED BY AW
CHECKED BY

WATERSHED OR PROJECT Kamaole Gulch

STATE Kihei, Maui, HI

STRUCTURE SITE OR SUBAREA

DR. AREA 1.20 SQ. MI. STRUCTURE CLASS B

T_c 2.5 HR. STORM DURATION 6 HR.

POINT RAINFALL 6 IN.

ADJUSTED RAINFALL:

AREAL: FACTOR 1 IN. 6

DURATION: FACTOR 1 IN. 6

RUNOFF CURVE NO. 80

Q 3.8 IN.

HYDROGRAPH FAMILY NO. 2

COMPUTED T_p 1.75 HR.

T_o 4.95 HR.

(T_o / T_p):

COMPUTED 2.83 ; USED 3

REVISED T_p 1.65

$q_p = \frac{484A}{\text{REV. } T_p}$ = 352 CFS.

$(Q)(q_p)$ = 1338 CFS.

t(COLUMN) = (t / T_p) REV. T_p q(COLUMN) = $(q_c / q_p)(Q)(q_p)$

Q(COLUMN) = $(Q_t / Q)Q$

	$t=(t/T_p)$Rev. T_p	$q=(q_c/q_p)(Q)(q_p)$	$Q_t=(Q_t/Q)Q$
	t HOURS	q CFS	Q INCHES
1	0	0	0
2	.53	4	0
3	1.06	23	.01
4	1.58	124	.06
5	2.11	416	.24
6	2.64	709	.62
7	3.17	823	1.13
8	3.70	769	1.67
9	4.22	652	2.15
10	4.75	547	2.55
11	5.28	460	2.89
12	5.81	373	3.17
13	6.34	276	3.39
14	6.86	181	3.54
15	7.39	116	3.64
16	7.92	72	3.70
17	8.45	43	3.74
18	8.98	25	3.76
19	9.50	16	3.78
20	10.03	11	3.79
21	10.56	7	3.79
22	11.09	4	3.80
23	11.62	3	3.80
24	12.14	1	3.80
25	12.67	0	3.80
26			
27			
28			
29			
30			
31			
32			
33			
34			

Existing Offsite
50-yr., 6-hr
Class B Structure

Total Drainage Area = 770 ac = $\frac{33,541,200}{5280^2}$ = 1.20 sq mi.
Length of Reach = 15,900'
Total Elev. Difference = 920 − 10 = 910' Avg. Slope = 5.7%
Curve Number

① Soil Type	Hydrologic Soil Gp	Curve No.
KNXD	B	79
KGKC	B	79
mxc	B	79
PZUE	C	86
JaC	A-1	95, 68
WIDZ	C	86
rVS	A	68

Pasture
$C_{N_{Avg}} = \frac{498}{770}(79) + \frac{76}{770}(86) + \frac{3}{770}(95) + \frac{13}{770}(86) + \frac{100}{770}(68) + \frac{80}{770}$
$= 51.09 + 10.77 + .37 + 1.15 + 11.17 + 5.30 = 79.59$
$\cong 80$

Assume T_c = 2.5 hr. → time of concentration
$T_p = 0.7\,T_c = 1.75$ hr

Existing Onsite — 10-yr. recurrence interval (1 hr.)

A = 53.9 ac.

L = 3100'

S = (120-10)/3100

C = .3 — $K = \sqrt{\frac{(3100)^3}{120-10}} = 16,457$

I = 1.8 — $T_c = .0078K^{.77} = 14$ min.

C_p = 2.0

$Q_{10} = .3(1.8)(2.0)(53.9) = 58$ cfs

PROPOSED ONSITE

* 10-yr. recurrence interval (1-hr.)

Runoff Coefficient → Paved Areas = .80 (5.56) = 4.45

Roof Areas = .80 (3.5) = 2.80

Landscaped Areas = .45 (7.33) = 3.30

Remaining Undeveloped = .30 (37.51) = 11.25

C = 21.80

$C_{avg} = \frac{21.80}{53.90} = 0.40$

$Q_{10} = 0.40(1.9)(2.0)(53.9) = 78$ cfs

* 50-yr. recurrence interval (1-hr.)

$Q_{50} = 0.40(2.25)(2.0)(53.9) = 97$ cfs

PROJECT: Rd. F + Kamaile Hts. Subd.

JOB NO. 93-611

BY AN DATE 10/19/93

CHKD. DATE

SHT. NO. 1 OF 1

AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS • SURVEYORS

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