

JOHN WAIHEE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF EDUCATION
HAWAII STATE PUBLIC LIBRARY SYSTEM
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OFFICE OF THE STATE LIBRARIAN

BARTHOLOMEW A. KANE
STATE LIBRARIAN

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OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

March 9, 1993

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

SUBJECT: Kihei Public Library
TMK: 3-9-12:13
Kihei, Maui, Hawaii

Dear Mr. Choy:

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

Notice of availability of the Draft Environmental Assessment for the project was published in the February 8, 1993 OEQC Bulletin. Letters received during the public comment period as well as our responses have been included in the Final Environmental Assessment.

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

Very truly yours,
Bartholomew A. Kane
Bartholomew A. Kane
State Librarian

Enclosures

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

39

1993-04-08-MA-FA-Kihai Library

APR 8 1993

Kihai Library

Final Environmental Assessment

Prepared for:



March 1993



Michael T. Munekiyo Consulting, Inc.

Kihel Library

***Final
Environmental Assessment***

Prepared for:



March 1993


Michael T. Munekiyo Consulting, Inc.

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Preface

The Hawaii State Public Library System proposes to construct a new Kihei Public Library in Kihei, Maui, Hawaii (TMK 3-9-12:13). Pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, Environmental Impact Statement Rules, the Final 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 proposed project is the Hawaii State Public Library System. The landowner of the property is the State of Hawaii.

Property Location and Description

The subject property is located in Kihei, Maui, Hawaii, north of Kalama Park and makai of the Kihei Fire Station.

The parcel is identified as TMK 3-9-12:13 and consists of 1.93 acres. Located makai of the South Kihei Road, the site fronts on Waimahaihai Street.

The site is presently vacant. Existing vegetation consists of mature kiawe trees, low lying shrubs and grasses.

Proposed Action

The proposed Kihei Public Library would occupy approximately 18,750 square feet of building area. It is proposed to be a one-story structure reaching approximately 30 feet in height. The project would provide space for a lobby, reference and periodical areas, circulation and copy desk, adult stacks and lounge, young adult area, children's stacks and area, and program and story-telling areas. Additional spaces include a staff and work area, building support systems area and public restrooms. A total of 77 on-site parking stalls are proposed.

Findings and Conclusion

The proposed Kihei Public Library would provide a new and larger facility which enhances the learning process for Kihei's students as well as provides a needed service to the community.

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. 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. Since portions of the site are subject to shallow flooding, construction of the proposed project will be in accordance with provisions of Ordinance No. 1145, pertaining to flood hazard districts. There are no known rare/threatened species of flora and fauna at the project site. Regarding an existing mound on the property, limited archaeological monitoring will take place during construction to determine if there are any intact wall sections or other intact structural remains at the base of the deposit. Archaeological monitoring will take place during construction on an existing dune formation on the makai side of the site.

The project would not have a significant impact on traffic in the vicinity of the project. Although side street traffic on Waimahaihai Street, at its intersection with South Kihei Road, does experience Level of Service "E" operating conditions during the existing PM peak hour, this is primarily influenced by through traffic demands on South Kihei Road. Further increases in through traffic on South Kihei Road are anticipated to occur without the project as well. From a regional perspective, reduction of traffic demands on South Kihei Road would require diversion of a significant amount of through traffic to Piilani Highway by construction of a system of mauka-makai collector/distributor roads. With regard to the project, intersection improvements are proposed at the Waimahaihai Street-South Kihei Road intersection to aid in the mitigation of impact resulting from the project.

No significant adverse drainage impacts to downstream properties should result from the proposed project. A subdrain system is proposed to be installed to handle all the runoff from the project site.

The project is not anticipated to have adverse impacts upon police, fire and medical services as well as other infrastructure systems. Beach access in the vicinity should not be impeded as a result of the project. Educational services are anticipated to be enhanced with the development of the project.

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

Chapter 1

Project Overview

I. PROJECT OVERVIEW

A. PROPERTY LOCATION, BACKGROUND AND LAND OWNERSHIP

The Hawaii State Public Library System proposes to construct a new Kihei Public Library in Kihei, Maui, Hawaii. The site is adjacent to the Kihei Fire Station and Kalama Park (TMK 3-9-12:13). See Figure 1. The subject property is 1.93 acres in size and fronts on Waimahaihai Street.

The Maui Library District currently has a total of 8 libraries. One library is located on Lanai and one is located on Molokai. Six are located on the island of Maui. These are in Wailuku, Kahului, Makawao, Hana, Lahaina, and Kihei.

In 1979, the Kihei Community Association requested that the State Librarian establish a library in Kihei. In 1981, the Kihei Library Station opened under the auspices of the Kihei Community Association and with the support and supervision of the Wailuku Public Library. In 1988, the Kihei Library became a Maui District Library.

The existing Kihei Library Station is located at the old Kihei Public School and present site of the Kihei Community Complex. The library occupies less than 2,000 square feet of space within an old classroom building. Also located on the old Kihei Public School Site are a County Department of Parks and Recreation office, restrooms, the Kihei Youth Center, volleyball and basketball courts and meeting halls.

The property on which the new Kihei Public Library is proposed (TMK 3-9-12:13) is owned by the State of Hawaii. Although Executive Order No. 3058 originally set aside these lands for park use, the Board of Land and Natural Resources amended the order on April 26, 1991 to allow for library use on the property. See Appendix A.

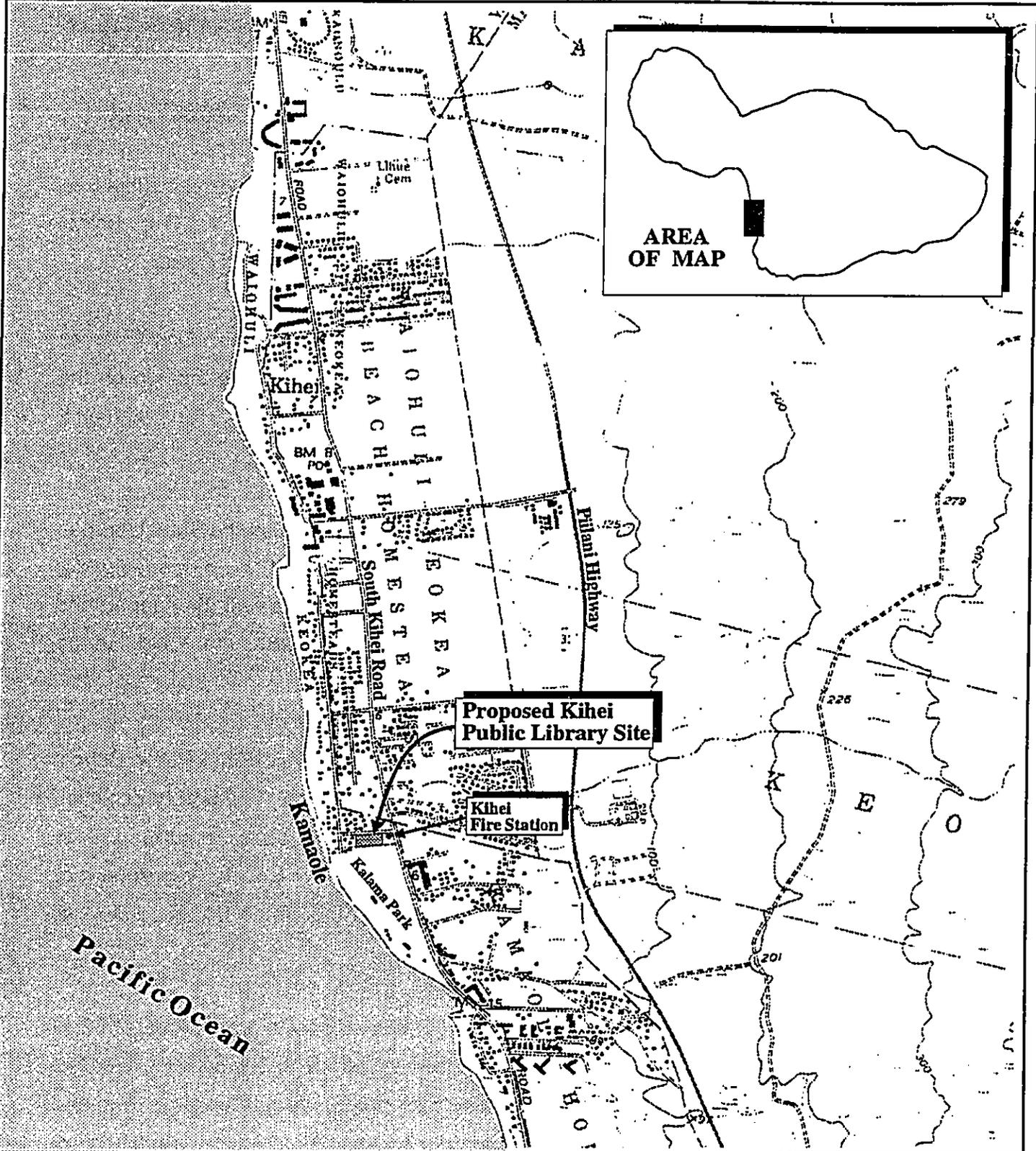
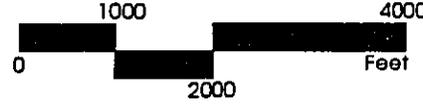


Figure 1

Kihei Library
Regional Location Map



Michael T. Munekiyo Consulting, Inc.
Prepared for: Hawaii State Public Library System

B. PROPOSED ACTION

1. Project Need

The service area for the proposed Kihei Public Library includes the Maalaea, Kihei, Wailea and Makena regions. A library facility is needed to enhance the learning process for Kihei's students as well as provide a service to the community. A larger library is needed to service a growing population in the region. In 1980, the population of the Kihei area was 7,262 (Aotani and Associates, Inc., 1981). The 1990 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).

2. Proposed Improvements

The proposed Kihei Public Library would occupy approximately 18,750 square feet of building area. See Figure 2. It is proposed to be a one-story structure reaching approximately 30 feet in height. See Figure 3. The project would provide space for a lobby, reference and periodical areas, circulation and copy desk, adult stacks and lounge, young adult area, children's stacks and area, and program and story-telling areas. Additional spaces include a staff and work area, building support systems area, and public restrooms. A total of 77 on-site parking stalls are proposed.

Since the existing Park District zoning does not allow library use, a change in zoning to Public/Quasi-Public District which allows library use, is being sought. The change in zoning is being recommended by the County of Maui, Planning Department, as noted in their letter of January 6, 1993. The subject property also is located within the

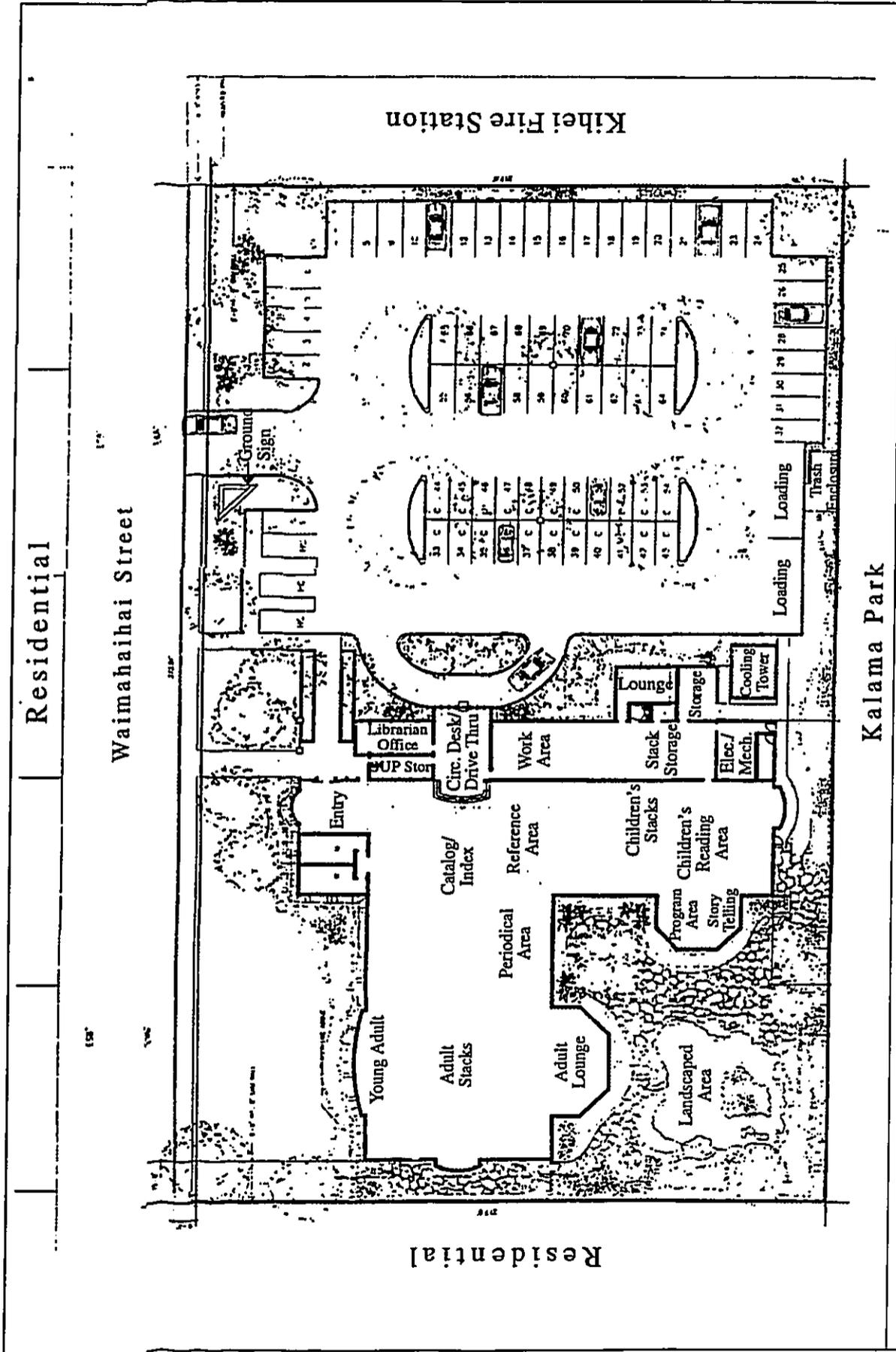


Figure 2



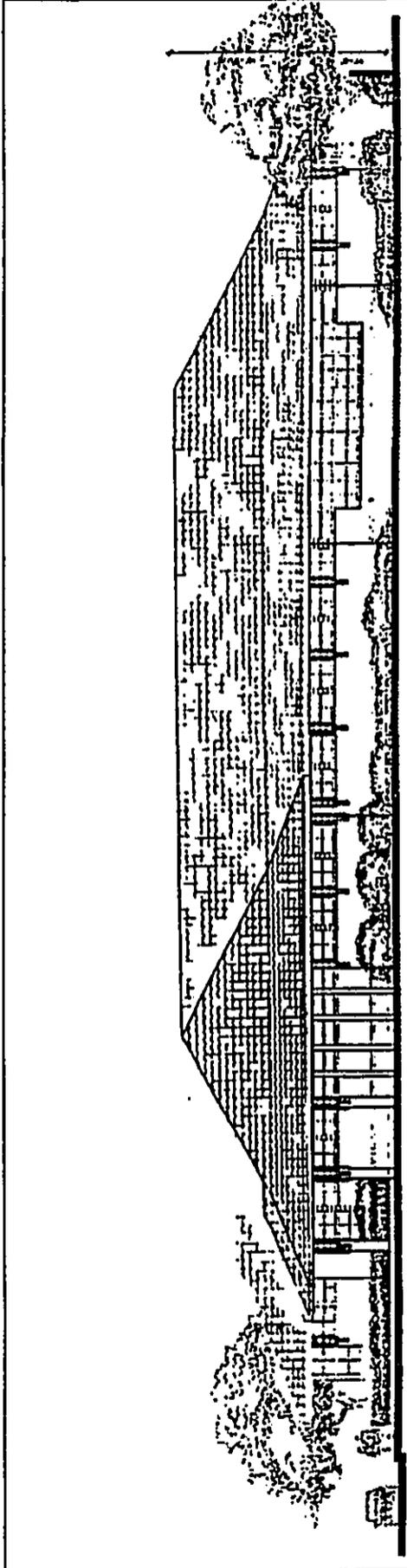
Kihei Library
Proposed Site Plan

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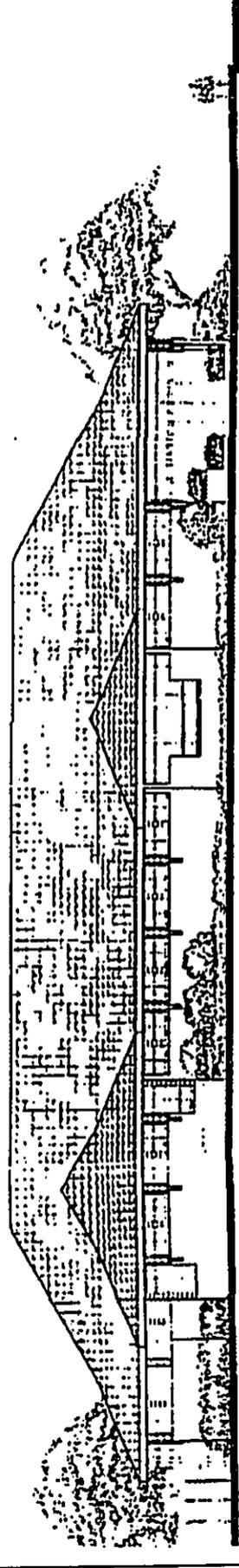


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Waimahaihai Street Elevation



Mauka Elevation

Figure 3

Kihei Library
Waimahaihai Street and Mauka Elevations

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County Special Management Area (SMA). Thus, an SMA permit must be obtained.

Change in Zoning and SMA applications are being submitted to the County Planning Department for review.

Assuming all applicable permits are obtained and funding is available, construction of the proposed project may begin as early as November 1993 with completion targeted for March 1995. Estimated project cost is approximately \$6.2 million.

Chapter II

Description of the Existing Environment

II. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. 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.

The Ma'alaea-Kihei-Makena region is subject to unique wind conditions due to specific terrain. The Ma'alaea area, which lies at the base of the central isthmus flanked by two mountain masses, is subject to a wind tunnel effect. As the wind squeezes between the mountain masses, its force becomes compressed, at times increasing velocity to more than 50 percent above the normal velocity in the Wailuku area. The wind fans out over Ma'alaea Bay, retaining the added velocity, with the inshore segment blowing parallel to the Kihei Coast. Along the shore, it meets the eddy current of the trades deflected along the southeast slopes of

Haleakala. This results in unpredictable local winds from Kalama Park to Cape Kina'u.

2. **Topography and Soil Characteristics**

The topography of the proposed project site is relatively flat, characteristic of the nearshore coastline in Kihei.

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 soil occurs on alluvial fans and in basins. See Figure 4.

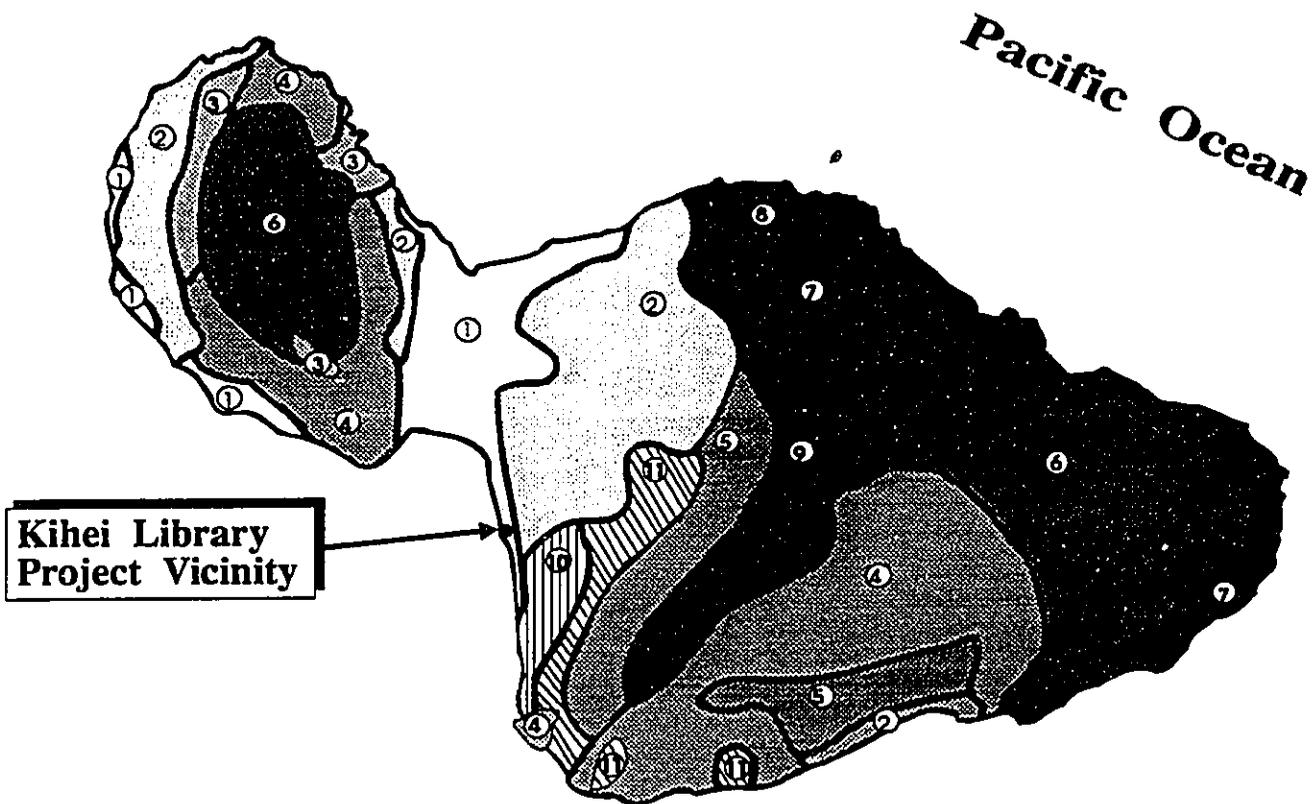
The soil type at the project site is Dune land (DL). See Figure 5. Dune land soils consist of sand-sized particles drifted and piled by the wind. The soils are subject to shifting, and as a result no soil horizons have developed over time. The sand is predominantly from coral and seashells.

3. **Flood and Tsunami Hazard**

According to the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency, a portion of the project site close to Waimahaihai Street, is located in Zone AO, which is an area of 100-year shallow flooding to a depth of 1 foot. A portion of the site bordering Kalama Park is within Zone AH which is an area of 100-year shallow flooding with a base flood elevation of 7 feet above mean sea level. A small portion of the site is designated as Zone C, areas of minimal flooding. See Figure 6.

LEGEND

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



Map Source: USDA Soil Conservation Service

Figure 4

**Kihei Library
Soil Association Map**



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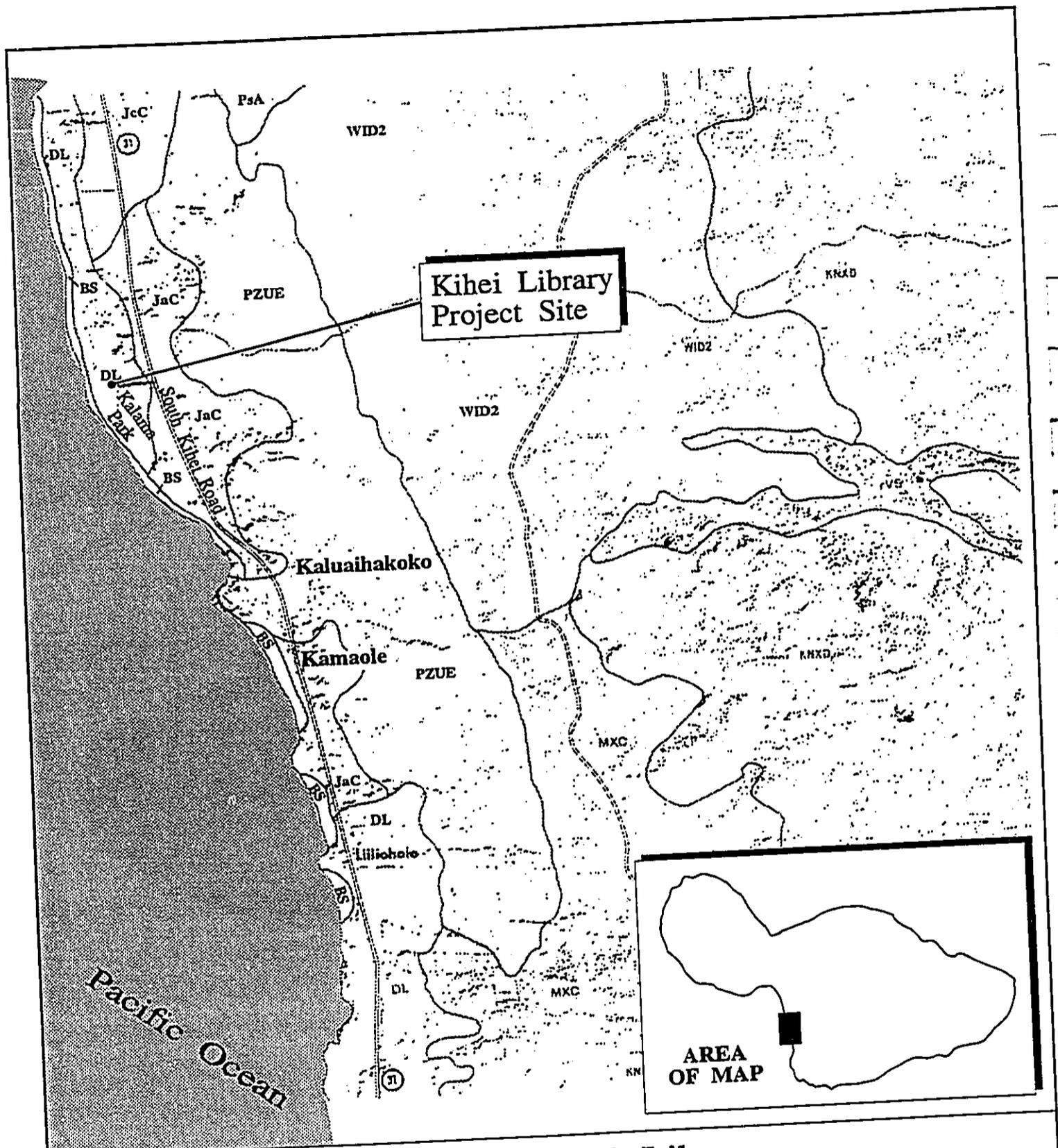


Figure 5

Kihei Library
Soil Classification at Project Site



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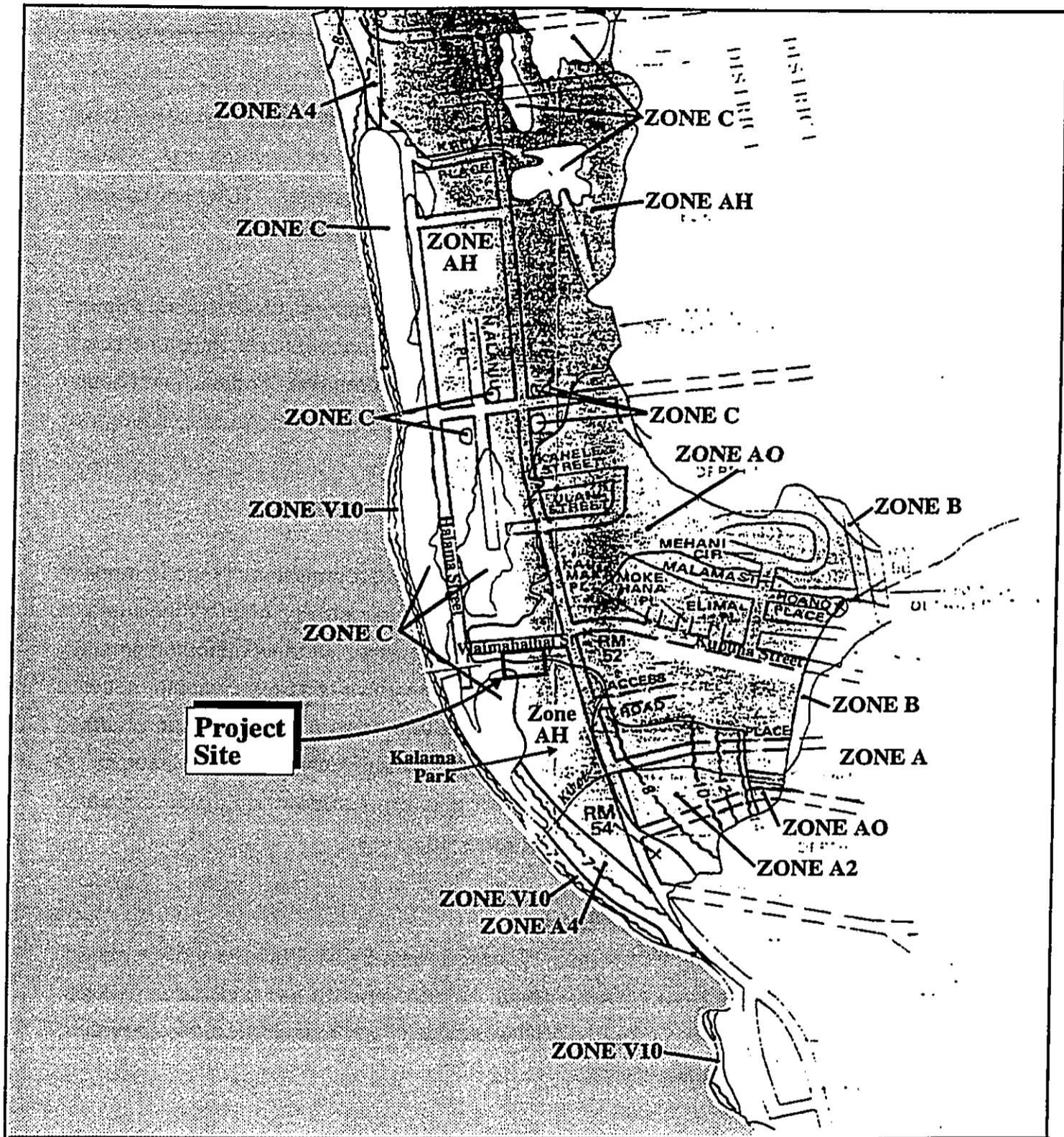


Figure 6

Kihei Library

Flood Insurance Rate Map



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4. **Flora and Fauna**

The flora and fauna of the project site is characteristic of the Kihei region. Dense thickets of kiawe trees occupy the site. Other vegetation includes low-lying shrubs and grasses. There are no rare or endangered plant species found at the site.

Fauna and avifauna is also characteristic of urban areas. Fauna typically found in the vicinity include mongoose, rats, dogs and cats. Avifauna typically include mynas, several types of doves, and house sparrows. There are no rare or endangered species of fauna or avifauna found at any of the sites.

5. **Air Quality**

There are no point sources of airborne emissions in the immediate vicinity of the project sites. 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.

6. **Noise Characteristics**

Background noise in this locale can be attributed to traffic travelling along South Kihei Road, Waimahaihai Street and Halama Street. The Kihei Fire Station and Kalama Park would also be a source of intermittent noise.

7. **Scenic and Open Space Resources**

The property is located approximately 500 feet from the shoreline. Land located makai and north of the subject property consists of single-family residential use abutting Waimahaihai and Halama Streets. Kalama Park is located south of the subject property. On the mauka side of the property lies the Kihei Fire Station, Kukui Mall, Kihei Town Center and the Kupuna Street residential area. The subject property is not a part of or in proximity to scenic corridors.

8. **Archaeological Resources**

An archaeological inventory survey with subsurface testing was conducted on the subject property as part of the Final Environmental Impact Statement for the Site Selection for the new Kihei Public Library. A 100 percent coverage surface survey and subsurface testing by hand-powered coring tools were done on the project site. A total of 14 auger cores were excavated in a systematic pattern across the project area. See Appendix B.

A single feature of note was located during the surface survey. It consists of what appears to be a secondary deposit of structural remains, located along the northern edge of the project area. See Figure 7. The deposit is a generally low, linear mound of mixed sand and dirt, boulders, cobbles, pebbles, and modern rubbish. It is 77.5 meters long and 3 to 8 meters wide. The maximum height of the mound from the surface of Waimahaihai Street is 1.38 meters.

A previous archaeological surface survey was done by Charles Keau in 1981. Two features were identified as being "possible archaeological features." Feature A, interpreted as a possible ko'a, or fishing shrine, was located on a mound of mixed dirt and sand.

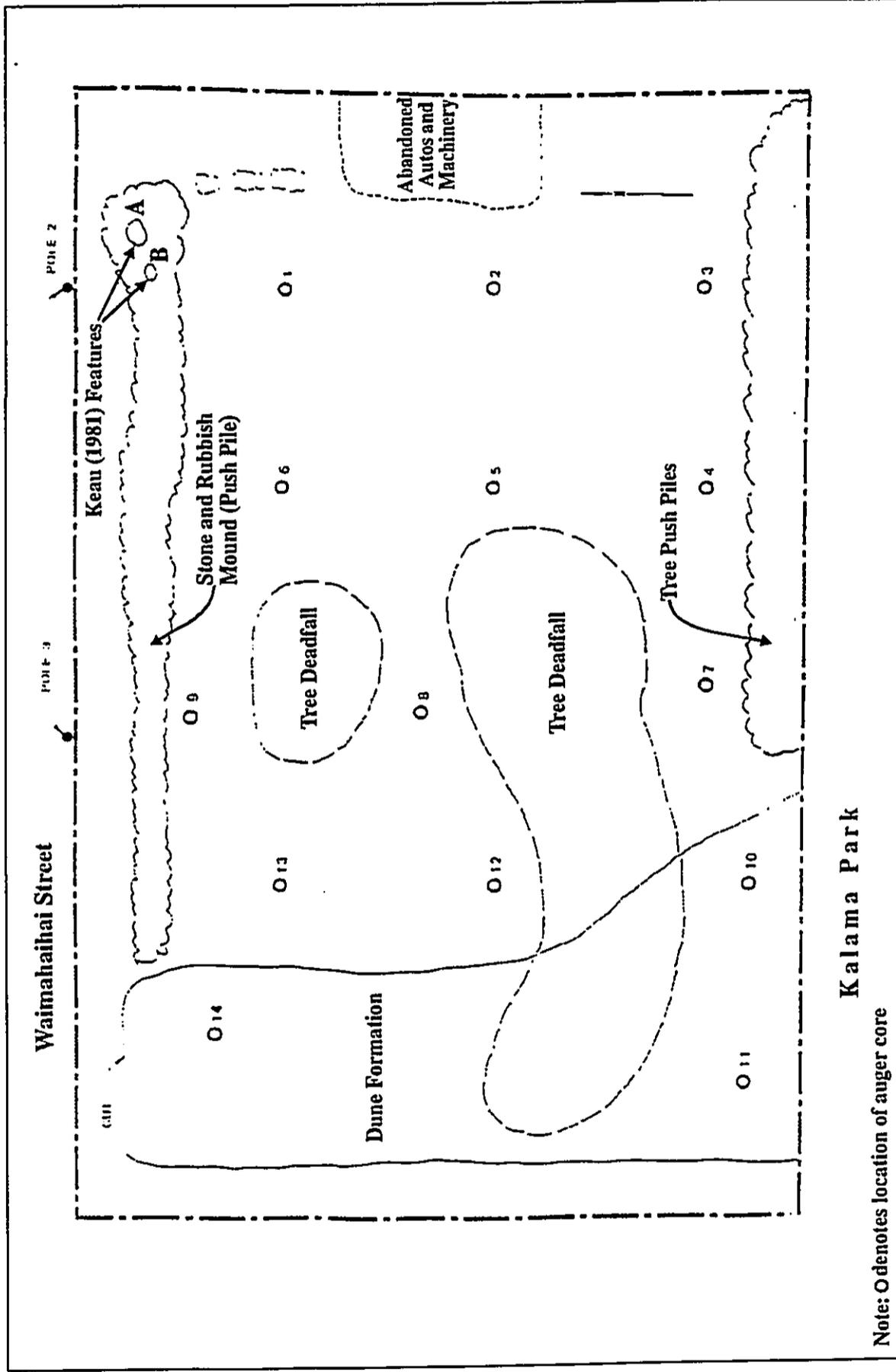


Figure 7

Kihei Library
Results of Archaeological Inventory Survey



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Feature B consisted of a stone alignment 1.7 meters long and approximately .4 meters wide.

A dune formation is also present of the subject property. The western edge of the mound occurs at the eastern edge of the dune formation. The dune appears to be cut at this point, either during road construction or small-scale sand borrowing. No buried features or deposits were found as a result of sub-surface testing.

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, adjacent to Kalama Park and the Kihei Fire Station.

2. Population

The population of the County of Maui has exhibited relatively strong growth over the past decade, with the 1990 population estimated to be 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 surrounding the project sites 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 Hyatt 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. **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 and abuts the subject property.

5. **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.

6. **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 Park, and numerous other beach parks along the Kihei coastline. Shoreline recreation includes swimming, fishing, picnicking and snorkeling.

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

7. **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.

8. **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 land widths of 11 feet in each direction. See Appendix C. South Kihei Road intersects Waimahaihai Street as an unsignalized, four-legged intersection. The mauka leg of this intersection is one of the access driveways to Kukui Mall. The other access driveways to Kukui Mall are located south of the intersection. The primary access to the proposed library would be through the intersection of South Kihei Road and Waimahaihai Street. 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 Wailea Resort.

Waimahaihai Street is a two-lane, two-way local roadway that is oriented in the mauka-makai direction and is located makai of South Kihei Road. Waimahaihai Street connects South Kihei Road with Halama Street, a local roadway serving the residential lots along the shoreline. Waimahaihai Street has a pavement width of 18 feet fronting the proposed project.

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. A 6-inch waterline along Waimahaihai Street provides service for the project.

3. Drainage

Under existing conditions, the site produces runoff at a rate of 0.83 cubic feet per second (CFS) based on a 10-year, 1-hour storm. See Appendix D. Existing storm runoff from the project site generally flows towards the center of the property, then percolates into the ground. The water table is approximately 3 feet below existing grade in this area.

Off-site runoff mauka of the project does not enter the site. Runoff from the Kihei Fire station sheet flows into Kalama Park. Runoff

from other areas drain onto Waimahaihai street and then into the ocean.

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).

An existing 8-inch sewer line is located within Waimahaihai Street fronting the project site.

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. Flood and Tsunami Hazard

In order to mitigate against flooding impacts, construction on the subject property will conform with provisions of Ordinance No. 1145, pertaining to flood hazard districts.

2. Flora and Fauna

There are no known significant habitats or rare, endangered or threatened species of flora and fauna located on the project site. The removal of the existing flora and the displacement of fauna from the site is not considered a significant adverse impact upon these environmental features.

3. Air Quality and Noise

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, and utilities and roadway construction for example, will generate air-borne particulates. Dust control measures, such as regular watering and sprinkling, will be implemented to minimize wind-blown emissions.

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

Ambient noise conditions will also 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.

4. **Scenic and Open Space Resources**

The addition of the library will enhance the visual character of the existing property and be in keeping with surrounding development. The site is located approximately 500 feet from the shoreline and will not encroach into view corridors along the coastline.

5. **Archaeological Resources**

Based on an archaeological inventory survey of the subject property, the only feature of note appears to be a secondary deposit of structural remains in the form of a mound 77.5 meters long and 3 to 8 meters wide. See Appendix B. Two previously identified features described by Keau in 1981 were relocated. These features have been determined to be portions of a more extensive secondary deposit of structural stone and twentieth century rubbish. The study notes that a possible interpretation for the source of structural stone in the deposit is that it represents the remains of a bi-faced, core-filled wall that was pushed over by machinery. Limited monitoring will take place during construction to determine if there are any intact wall sections or other intact structural remains at the base of the deposit.

With regard to the dune formation, archaeological monitoring will be conducted. Although no buried features or deposits were found from the auger coring, the dune formation is relatively undisturbed and features could be present between the coring locales.

6. Use of Chemicals and Fertilizers

Use of herbicides on the project site will generally be limited to the initial plant establishment period. Pesticides are anticipated to be used only as a treatment and not as a preventive measure. As a treatment, application usage will be minimal. In addition, plant selection for the project will be based on hardiness, drought tolerance, pest resistance as well as aesthetic concerns.

Nitrogen/Phosphorus/Potash mixed fertilizers are anticipated to be applied to lawn areas, groundcover, and flowering shrubs. With proper irrigation management practices, leaching of fertilizers should be negligible.

No adverse effects on surface, underground and marine water resources are anticipated.

B. IMPACTS TO COMMUNITY SETTING

1. Surrounding Uses

The subject property is located in the central portion of Kihei Town. The library is in keeping with the single-family residential area along Waimahaihai and Halama Streets located to the north and makai of the site. The library also is in close proximity to and compatible with commercial developments abutting South Kihei Road. Residential development is located mauka of the commercial use along South Kihei Road. The library also is in keeping with Kalama Park which is located south of the site.

2. Population and 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 to the service sector for project operations and maintenance. Direct on-site employment generated by the project will likely be limited to a library staff of 11. This includes the library staff as well as maintenance and landscaping personnel.

3. Agriculture

The project site is currently not in agricultural use. The effect of development of the subject property on agricultural endeavors on the island is negligible.

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 significantly increase resident population for the region as a whole and will not extend existing service area limits for emergency services.

5. Recreational and Educational Services

The proposed project is not anticipated to significantly increase recreational demand in the district. Development of the property will not impede beach access in the vicinity.

Educational services are anticipated to be enhanced with the development of the proposed project. A new library facility would provide additional educational resources for the community.

Within the project site, there are no known traditional beach and mountain access trails.

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 for the disposal of clearing and grubbing material from the site during construction.

Once completed, the proposed project will be served by a private refuse collection company. Solid waste generated from the project will be disposed at the County's Central Maui Landfill.

C. **IMPACTS TO INFRASTRUCTURE**

1. **Roadways**

During construction of the project, all construction employee parking shall be accommodated on the project site, to the greatest extent practicable.

Regarding long-term impacts, a traffic impact report was done for the subject project. See Appendix C. The trip generation methodology is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE). The trip rates are developed empirically, by correlating vehicle trip generation data with various land use characteristics, such as vehicle trips per gross floor area of development.

Based on this methodology, the proposed Kihei Public Library is expected to generate 61 vehicles during the projected mid-day peak hour of traffic, with 29 vehicles entering and 32 vehicles exiting. During the projected PM peak hour of traffic, the proposed library is expected to generate 116 vehicles, with 62 vehicles entering and 54 exiting.

The traffic generated by the proposed project is then distributed and assigned to the roadways in the study area. The distribution of traffic is based upon existing traffic patterns. Finally, through traffic in the vicinity of the project was forecasted based upon historical traffic count data.

The traffic impact report concludes that the Kihei Public Library would not have a significant impact on traffic in the vicinity of the project. Although side street traffic on Waimahaihai Street, at its intersection with South Kihei Road, does experience Level of Service "E" operating conditions during the existing PM peak hour, the service quality at this intersection is primarily influenced by through traffic demands on South Kihei Road.

Under the present roadway network, the increase in through traffic on South Kihei Road is expected to occur even without the development of the proposed library. The additional through traffic also would increase side street delays.

To reduce through traffic demands on South Kihei Road would require diverting a significant amount of the through traffic to Piilani Highway. From a regional perspective, the study suggests that this could be done by providing a system of sufficient mauka-makai collector/distributor roads between Piilani Highway and South Kihei Road.

The following specific improvements are recommended by the traffic report.

1. The existing pavement of Waimahaihai Street, fronting the project site, provides two 9-foot lanes, one lane in each direction. The pavement should be widened to provide two

11-foot lanes that would facilitate turning maneuvers in and out of the proposed access driveways.

2. The mauka bound approach of Waimahaihai Street, at its intersection with South Kihei Road, should be striped as two lanes; a shared left-turn/through lane, and an exclusive right-turn lane.
3. North bound and south bound left-turn lanes on South Kihei Road at Waimahaihai Street are recommended. The left-turn lanes on South Kihei Road should maintain through traffic flow on the roadway.

Pursuant to the comments of the Department of Public Works, a road widening lot would be provided for the adjoining half of Waimahaihai Street and improved to County standards.

2. **Water**

Water will be furnished by the domestic system servicing the area. During the maintenance period for the landscaping, the average daily demand for the project is estimated to be about 11,780 gallons per day. After the maintenance period, average daily demand is approximately 11,130 gallons per day.

3. **Drainage**

With the proposed project, the site will produce runoff at the rate of 2.99 CFS. This represents a 2.16 CFS increase due to construction of the project. See Appendix D.

Existing drainage patterns are proposed to be maintained. The site would be filled to raise the ground elevation approximately 2 to 3 feet. A subdrain system will be installed on-site to handle all the runoff from the project site. Drain inlets distributed throughout the

site will collect on-site runoff into an underground perforated pipe subdrain system or wet well.

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

4. **Wastewater System**

The proposed project is estimated to generate an average daily flow of approximately 1,380 gallons per day of wastewater.

The design capacity of the Kihei Wastewater Reclamation Facility is 6.0 MGD. 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 approaching its design capacity, the Maui County Council passed Ordinance Nos. 1787, 1843, and 2022 which allocated remaining capacity to various uses. Although Section 20.16.070(A) of the Maui County Code allocates 50,000 gallons per day for Public/Quasi-Public Uses, an allocation of capacity is not ensured at the present time.

However, proposed improvements to the Kihei Wastewater Reclamation Facility would increase design capacity to 8.0 MGD. When this additional capacity becomes available in 1995, the project should be able to hook-up to the County system. The County also

has a sewer impact fee ordinance in effect which covers plant expansion costs and collection system improvement.

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

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". The subject parcel is within the "Urban" district. See Figure 8. The proposed action involves the use of the property for a library which 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:

Objective: To provide Maui residents with continually improving quality educational opportunities which can help them better understand themselves and their surroundings and help them realize their ambitions.

Policy:

Require that quality educational facilities and services be available to all residents.

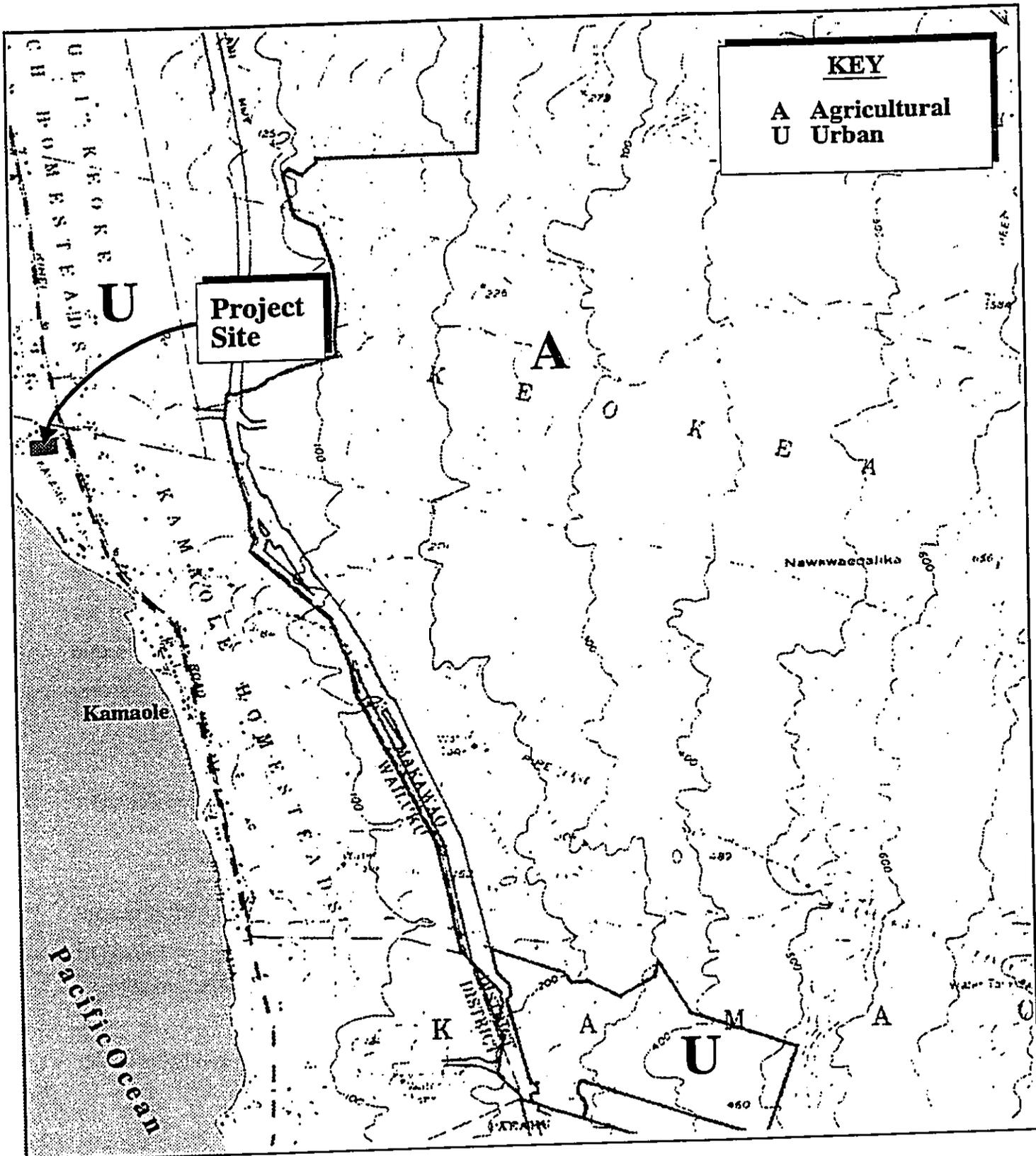
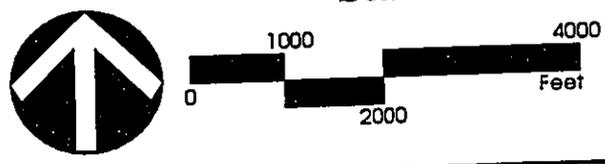


Figure 8 **Kihei Library**
 State Land Use District Designations




 Michael T. Munekiyo Consulting, Inc.
 Prepared for: Hawaii State Public Library System

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. 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.

The subject parcel is designated Public/Quasi-Public which includes library use. See Figure 9.

D. 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. Access to the shoreline through Kalama Park and Waimahaihai Street will continue as it currently exists.

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: Based on an archaeological inventory survey, the property contains a secondary deposit of structural remains in the form of a mound 77.5 meters long and 3 to 8 meters wide. Limited monitoring is proposed to take place during construction to determine if there are any significant intact structural remains. The property also contains a dune formation. Although auger coring did not reveal significant buried features or deposits, archaeological monitoring is proposed during construction.

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 proposed project would provide a needed facility which enhances the county's educational and social well-being. The project has an indirect beneficial effect on the State's economy by aiding in the provision of an educated and trained employment base. Moreover, 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. In order to mitigate against flooding impacts, construction will conform with provisions of Ordinance No. 1145, pertaining to flood hazard districts.

7. **Managing Development**

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

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 Kihei Public Library would provide a new and larger facility which enhances the learning process for Kihei's students as well as provides a needed service to the community.

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. 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. Since portions of the site are subject to shallow flooding, construction of the proposed project will be in accordance with provisions of Ordinance No. 1145, pertaining to flood hazard districts. There are no known rare/threatened species of flora and fauna at the project site. Regarding an existing mound on the property, limited archaeological monitoring will take place during construction to determine if there are any intact wall sections or other intact structural remains at the base of the deposit. Archaeological monitoring will take place during construction on an existing dune formation on the makai side of the site.

The project would not have a significant impact on traffic in the vicinity of the project. Although side street traffic on Waimahaihai Street, at its intersection with South Kihei Road, does experience Level of Service "E" operating conditions during the existing PM peak hour, this is primarily influenced by through traffic demands on South Kihei Road. Further increases in through traffic on South Kihei Road are anticipated to occur without the project as well. From a regional

perspective, reduction of traffic demands on South Kihei Road would require diversion of a significant amount of through traffic to Piilani Highway by construction of a system of mauka-makai collector/distributor roads. With regard to the project, intersection improvements are proposed at the Waimahaihai Street-South Kihei Road intersection to aid in the mitigation of impact resulting from the project.

No significant adverse drainage impacts to downstream properties should result from the proposed project. A subdrain system is proposed to be installed to handle all the runoff from the project site.

The project is not anticipated to have adverse impacts upon police, fire and medical services as well as other infrastructure systems. Beach access in the vicinity should not be impeded as a result of the project. Educational services are anticipated to be enhanced with the development of the project.

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

Chapter VI

***Agencies Contacted in the
Preparation of the
Environmental Assessment
and Responses Received***

VI. AGENCIES CONTACTED IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT AND RESPONSES RECEIVED

The following agencies were contacted during the preparation of the Environmental Assessment.

1. U.S. Army Corps of Engineers
Pacific Ocean Division
Building 230
Fort Shafter, Hawaii 96858
2. Mr. David Nakagawa, Chief Sanitarian
Department of Health
54 High Street
Wailuku, Hawaii 96793
3. Mr. Tom Arisumi, Division Chief
Department of Health
Environmental Management Division
Five Waterfront Plaza, Suite 250
500 Ala Moana Boulevard
Honolulu, Hawaii 96813
4. Maui District Superintendent
Department of Education
54 High Street, 4th Floor
Wailuku, Hawaii 96793
5. Department of Land and Natural Resources
State Historic Preservation District
1151 Punchbowl Street
Honolulu, Hawaii 96813
6. Mr. Brian Miskae, Director
Department of Planning
250 South High Street
Wailuku, Hawaii 96793
7. Mr. David Craddick, Director
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793
8. Ms. Charmaine Tavares, Director
Department of Parks and Recreation
200 South High Street
Wailuku, Hawaii 96793
9. Mr. Lloyd Lee
Department of Public Works
Division of Engineering
200 South High Street
Wailuku, HI 96793
10. Mr. David Wissmar
Department of Public Works
Solid Waste Division
200 South High Street
Wailuku, Hawaii 96793
11. Mr. Eassie Miller
Department of Public Works
Wastewater Reclamation Division
200 South High Street
Wailuku, Hawaii 96793
12. Mr. Gene Thompson, President
Kihei Community Association
P. O. Box 662
Kihei, Hawaii 96753

JAN 8 1993



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

January 5, 1993

REPLY TO
ATTENTION OF:

Planning Division

Mr. Michael T. Munekiyo, A.I.C.P.
Michael T. Munekiyo Consulting, Inc.
1823 Wells Street, Suite 3
Wailuku, Maui, Hawaii 96793

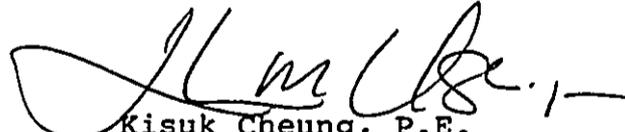
Dear Mr. Munekiyo:

Thank you for the opportunity to review and comment on the Proposed New Kihei Public Library, Kihei, Maui, Hawaii (TMK 3-9-12: 13). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. The project does not involve work in waters of the U.S.; therefore, a DA permit is not required.

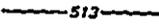
b. According to the enclosed Federal Emergency Management Agency's Flood Insurance Rate Map, panel number 150003-0265-C, dated September 6, 1989, the project site is located in Zone AH (areas inundated by the 100-year flood with a base flood elevation of 7 feet above mean sea level); Zone A0 (areas inundated by 100-year shallow flooding with a depth of 1.0 foot); and Zone C (areas of minimal flooding).

Sincerely,


Kisuk Cheung, P.E.
Director of Engineering

Enclosure

KEY TO MAP

Far Flood Boundary		ZONE B
Far Flood Boundary		ZONE B
Designations		ZONE B
Far Flood Boundary		ZONE B
Far Flood Boundary		ZONE B
Flood Elevation Line Elevation in Feet**		513
Flood Elevation in Feet Uniform Within Zone**		(EL 987)
Location Reference Mark		RM7x
Boundary		
Scale		1:11.5

Referenced to the National Geodetic Vertical Datum of 1929

EXPLANATION OF ZONE DESIGNATIONS

EXPLANATION

- 1 Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
- 2 Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- 3 Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
- 10 Areas of 100-year flood; base flood elevations and flood hazard factors determined.
- 11 Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
- 12 Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
- 13 Areas of minimal flooding. (No shading)
- 14 Areas of undetermined, but possible, flood hazards.
- 15 Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
- 16 Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
FLOOD INSURANCE RATE MAP**

MAUI COUNTY, HAWAII

PANEL 265 OF 400
(SEE MAP INDEX FOR PANELS NOT PRINTED)

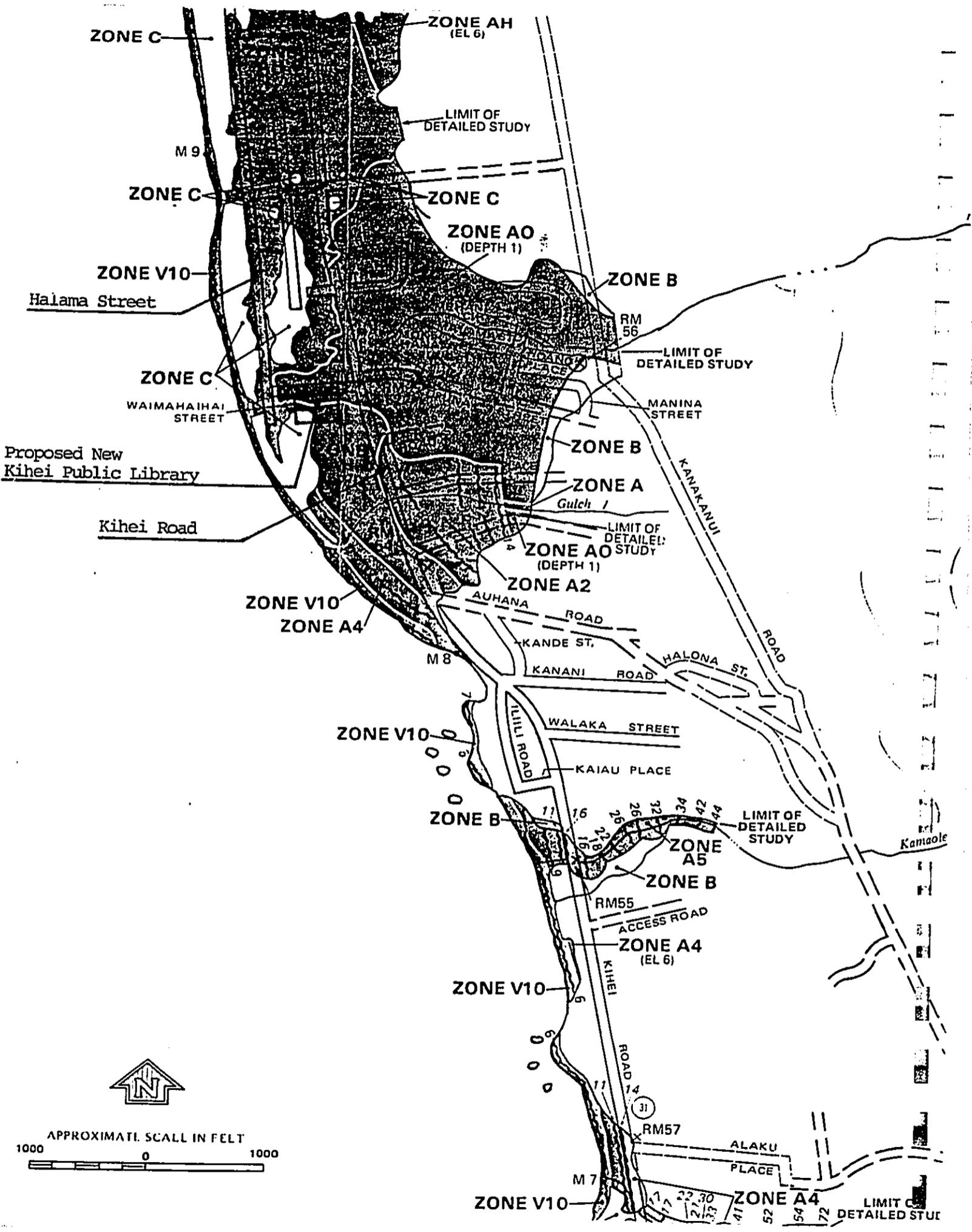
COMMUNITY-PANEL NUMBER
150003 0265 C

MAP REVISED:
SEPTEMBER 6, 1989



Federal Emergency Management Agency

CUSTOMER COPY



APPROXIMATE SCALE IN FEET
 1000 0 1000

JOHN WAIHEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH
PAUL E. HOFFMAN, M.D., M.P.H.
DISTRICT HEALTH SERVICES ADMINISTRATOR (M.D.)

December 16, 1992

Mr. Michael T. Munekiyo, A.I.C.P.
Michael T. Munekiyo Consulting, Inc.
1823 Wells St., Suite 3
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

Subject: Proposed Construction of New Kihei Public Library

Thank you for the opportunity to review and comment on the subject proposal. Due to the general nature of your proposal on the subject matter, we reserve the right to further review and comment in the future.

Noise may be a nuisance from the surrounding area. The Kihei Fire Station and Kalama Park will generate noise activities. Also, use of proposed public restrooms and parking stalls by non-library users may generate complaints by the public.

If you have further questions, please call me at 243-5255.

Sincerely,


DAVID H. NAKAGAWA
Environmental Health Program Supervisor

JOHN WADSWORTH
GOVERNOR OF HAWAII



JAN 4 1993

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

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIAKE

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION

LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 8TH FLOOR
HONOLULU, HAWAII 96813

December 29, 1992

LOG NO.: 7052
DOC NO.: 9212AG63

Mr. Michael Munekiyo
Michael T. Munekiyo Consulting, Inc.
1823 Wells St., Suite 3
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

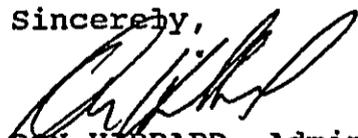
SUBJECT: Historic Preservation Review of the New Kihei Public
Library
Kama'ole, Wailuku, Maui
TMK: 3-9-12: 13

This is in response to your letter dated December 11, 1992,
seeking our comments on the proposed construction of the new
Kihei Public Library.

We have previously reviewed the Draft Environmental Impact
Statement on this proposed project. An archaeological survey
conducted by Paul H. Rosendahl, Inc. (Donham 1990. Archaeological
Inventory Survey, Potential Kihei Public Library Site D, Land of
Kamaole, Wailuku District, Island of Maui) identified no
significant historic sites on this parcel. Therefore, we
determined that the proposed project will have "no effect" on
significant historic sites. However, because of the presence of
sand dunes at the makai portion of the property, we recommend
that an archaeological monitoring be conducted during ground
alteration activities.

Please contact Ms. Annie Griffin at 587-0013 if you have any
questions.

Sincerely,


DON HIBBARD, Administrator
State Historic Preservation Division

AG:aal

LINDA CROCKETT LINGLE
Mayor

JAN 11 1993



**COUNTY OF MAUI
PLANNING DEPARTMENT**

250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

January 6, 1993

Mr. Michael Munekiyo
1823 Wells Street, Suite 3
Wailuku, HI 96793

Dear Mr. Munekiyo:

RE: Proposed Kihei Public Library, TMK:3-9-12:13, Kihei,
Maui.

This letter will acknowledge your letter dated December 11, 1992 on the above mentioned project. We apologize for the delay in our response.

Please be advised that the project site is located in the Public/Quasi-Public land use category in the Kihei-Makena Community Plan. As such, the proposed library use conforms to said community plan. However, the project site is located in the Park District, (Land Zoning Map No. 5) which does not permit libraries. Therefore, we would recommend that a change in zoning be obtained to the appropriate Public/Quasi-Public District.

The property is also located within the Special Management Area. Therefore, the proposed project will be subject to Article II, Special Management Area Rules and Regulations of the County of Maui.

According to the REDI Realty Atlas of Hawaii, 1992, the property appears to be under Executive Order No. 3058, which may limit the use of the property to "addition to Kalama Park" only. An amendment to this Executive Order may have to be obtained from the State, to allow the proposed library use.

Thank you for the opportunity to comment. Should you have any questions, please contact Mr. Daren Suzuki at 243-7735.

Very truly yours,

A handwritten signature in black ink, appearing to read "B. Miskae".

BRIAN MISKAE
Planning Director

cc: D. Suzuki
DS/sc/a:kiheilib.ltr

LINDA CROCKETT LINGLE
Mayor

GEORGE N. KAYA
Director

CHARLES JENCKS
Deputy Director

LLOYD P.C.W. LEE, P.E.
Chief Staff Engineer



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793
January 7, 1993

ARUNO SHINMOTO, P.E.
Laboratory Codes Administration
EASSIE MILLER, P.E.
Wastewater Reclamation Division
RALPH NAGAMINE, P.E.
Engineering Division
BRIAN HASHIRO, P.E.
Solid Waste Division
MELVIN HIPOLITO
Highways Division

Michael T. Munekiyo, Consulting, Inc.
1823 Wells Street, Suite 3
Wailuku, HI 96793

SUBJECT: PROPOSED CONSTRUCTION OF NEW KIHEI PUBLIC LIBRARY
TMK: 3-9-12:13

Dear Mr. Munekiyo:

We have reviewed the above request and offer the following comments in response to your letter dated December 11, 1992:

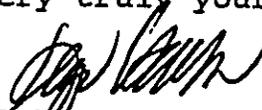
1. That the architect and owner are advised that the project is subject to possible tsunami and flood inundation. As such, said project must conform to Ordinance No. 1145, pertaining to flood hazard districts.
2. That a road widening lot be provided for the adjoining half of Waimahaihai Street and improved to County standards, to include but not be limited to, pavement widening, construction of curb, gutter and sidewalk, and relocation of utilities underground. Said lot shall be dedicated to the County upon completion of the improvements.
3. That the existing Waimahaihai Street does not meet County standards based on roads located in urban zoning.
4. That a final detailed drainage and erosion control plan including, but not limited to, hydrologic and hydraulic calculations, scheme for controlling erosion and disposal of runoff water, and an analysis of the soil loss using the HESL erosion formula, be submitted to the Department of Public Works, Engineering Division for our review and approval. The plan shall provide verification that the grading and runoff water generated by the project will not have an adverse effect on the adjacent and downstream properties.

Michael T. Munekiyo Consulting, Inc.
Page Two
January 7, 1993

5. That the applicant shall submit for review and approval a Traffic Impact Analysis Report addressing traffic impacts at the intersection of Waimahaihai Street and South Kihei Road and vehicular access to the project site.
6. That during the construction of this project, all construction employee parking shall be accommodated on the project site and not within the County road right-of-way.
7. Provide a water quality report including project mitigation measures (acceptable to the State Department of Health and Department of Public Works) which evaluates the quality of the storm water discharging into the ocean receiving waters. The report should include a discussion on sediment and nutrient loadings at all drainage outlets.

If you have any questions regarding this matter, please call me at 243-7745.

Very truly yours,


LEOYD P.C.W. LEE
Engineering Division Chief

LL:dh (ED92-14)
NewKihei.Lib

xc: Director of Public Works
LUCA
Planning Department

JAN 1 2 1993

LINDA CROCKETT LINGLE
Mayor
GEORGE N. KAYA
Director
CHARLES JENCKS
Deputy Director
AARON SHINMOTO, P.E.
Chief Staff Engineer



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

December 28, 1992

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration
EASSIE MILLER, P.E.
Wastewater Reclamation Division
LLOYD P.C.W. LEE, P.E.
Engineering Division
DAVID WISSMAR, P.E.
Solid Waste Division
BRIAN HASHIRO, P.E.
Highways Division

Michael T. Munekiyo Consulting, Inc.
Mr. Michael T. Munekiyo
79-A Church Street
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

SUBJECT: SOLID WASTE MANAGEMENT PLAN FOR THE PROPOSED
CONSTRUCTION OF THE NEW KIHEI LIBRARY, TMK: 3-9-12:13

In response to your letter of December 11, 1992, the following applies:

1. Request the Hawaii State Library System to continue their used book and periodical disposal program. Please reduce the amount of printed material going to the landfill as much as possible.
2. Initiate a compost program, whereby yard trimmings are composted on the library site and composted materials are spread on surrounding landscaping.
3. Clearing and grubbing material shall not be hauled to the County landfill, but disposed of in other approved sites.
4. All refuse for the landfill shall be handled by DAGS personnel or a commercial hauler.

If there are any further questions or concerns, please contact me at 243-7875.

Very truly yours,

A handwritten signature in cursive script, appearing to read "David F. Wissmar".
DAVID F. WISSMAR
Solid Waste Division Chief

DFW:jip

xc: Planning Department
Land Use & Codes Division

JAN 4 1993

LINDA CROCKETT LINGLE
Mayor
GEORGE N. KAYA
Director
CHARLES JENCKS
Deputy Director
AARON SHINMOTO, P.E.
Chief Staff Engineer



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration
EASSIE MILLER, P.E.
Wastewater Reclamation Division
LLOYD P.C.W. LEE, P.E.
Engineering Division
DAVID WISSMAR, P.E.
Solid Waste Division
BRIAN HASHIRO, P.E.
Highways Division

December 24, 1992

Mr. Michael Munekiyo
Michael T. Munekiyo Consulting, Inc.
1823 Wells Street, Suite 3
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

SUBJECT: PROPOSED CONSTRUCTION OF NEW KIHEI PUBLIC LIBRARY

Thank you for giving us the opportunity to comment on this project.

There is an existing 8" sewer line in Waimahaihai Street fronting the project site.

At the present time, the Kihei Wastewater Reclamation Facility has approximately 50,000 gallons/day available for public/quasi public uses. We cannot, however, insure that system capacity will be available for the project. Wastewater treatment capacity is allocated to each project when the building permit is issued.

The developer will be assessed impact fees for treatment plant expansion costs and collection system improvement.

If you have any additional questions or wish to discuss this matter further, please call Dave Taylor at 243-7428.

Sincerely,

Handwritten signature of Eassie Miller in cursive script.

Eassie Miller, Chief
Wastewater Reclamation Division

DT:gmd(CT93064)

Chapter VII

**Letters Received after Filing of
Draft Environmental Assessment
and Proposing Agency Response**

FEB 2 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) 506-4185

February 1, 1993

Mr. Bartholomew Kane, State Librarian
Department of Education
Hawaii State Public Library System
465 South King Street
Honolulu, Hawaii 96813

Attention: Mr. Clyde Okinaga

Dear Mr. Kane:

SUBJECT: DRAFT EA FOR THE KIHEI PUBLIC LIBRARY, WAILUKU, MAUI

We have completed our review of the subject document and have several comments to offer.

- ▶ Please include in the Final EA, a copy of the Board of Land and Natural Resources letter of April 26, 1991, which amended Executive Order 3058 mentioned on page one of the Draft EA. This will address the County of Maui, Planning Department's concerns discussed in the fourth paragraph of their letter dated January 6, 1993.
- ▶ The Final EA should address the necessary County zoning change from the Park District to the Public/Quasi-Public District. This is discussed in the second paragraph of the County of Maui, Planning Department's letter of January 6, 1993.
- ▶ When submitting the Final EA, you may choose to reference the appendices from the Draft EA instead of reprinting them again. This option will reduce the amount of paper used and cut down on your postage costs, as will printing the Final EA on both sides of the paper.

If you have any questions, please call Margaret Wilson at 586-4185. Thank you.

Sincerely,

Brian J.J. Choy

Brian J.J. Choy
Director

c: /Michael T. Munekiyo

JOHN WAINES
GOVERNOR

BARTHOLOMEW A. KANE
STATE LIBRARIAN



STATE OF HAWAII
DEPARTMENT OF EDUCATION
HAWAII STATE PUBLIC LIBRARY SYSTEM
465 SOUTH KING STREET, B-1
HONOLULU, HAWAII 96813

OFFICE OF THE STATE LIBRARIAN

March 23, 1993

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

Dear Mr. Choy:

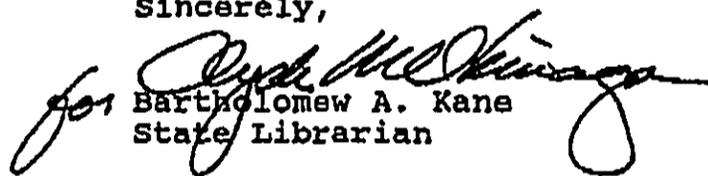
SUBJECT: Draft EA for Kihei Public Library

Thank you for your February 1 1993, letter on the subject project.
Our responses to your comments are as follows:

1. Within the Final EA, we have included a copy of Executive Order (EO) No. 3058 as well as the April 26, 1991 amendment of the EO by the Board of Land and Natural Resources (BLNR). EO No. 3058 pertains to use of the property as a public park while the action of the BLNR cancelled the original EO and set aside the lands for use as a public library.
2. We have included a discussion of the change in zoning application within the Final EA. We acknowledge that a change in zoning submittal must be made to the County of Maui as noted in the Planning Department's letter of January 6, 1993.
3. We have not referenced the appendices from the Draft EA. This is because the Final EA will be submitted to the County of Maui as part of the change in zoning and Special Management Area Permit applications. Thus, the documentation contained in the appendices may be useful in the County's review. As you have suggested, however, we have printed both sides of the paper in order to reduce paper usage.

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

Sincerely,


for Bartholomew A. Kane
State Librarian

FEB 9 1993

JOHN WAIHEE
GOVERNOR OF HAWAII



JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:

February 5, 1993

92-456/epo

Mr. Michael T. Munekiyo
Michael T. Munekiyo Consulting, Inc.
1823 Wells Street, Suite 3
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

Subject: Construction of New Kihei Public Library

This correspondence is in response to your letter, dated December 11, 1992, addressed to Mr. Tom Arizumi, Chief, Environmental Management Division, in which you requested pre-environmental assessment comments on the subject proposal.

You also sent the same letter to Mr. David Nakagawa, our Chief Sanitarian in the Maui District Health Office, and he responded to you by letter, dated December 16, 1992. I would like to reference that letter and add one further comment.

The subject project is located within the County sewer service system. As the area is sewered, we have no objections to the proposed construction of a new Kihei Public Library, provided that it is connected to the public sewers.

The Department of Accounting and General Services should work closely with the County to assure the availability of additional treatment capacity and adequacy for the project. Non-availability of treatment capacity will not be an acceptable justification for use of any private treatment works.

Very truly yours,

A handwritten signature in cursive script, appearing to read "John C. Lewin".

JOHN C. LEWIN, M.D.
Director of Health

c: Wastewater Branch
Maui District Health Office (D. Nakagawa)

JOHN WAIHEE
GOVERNOR



BARTHOLOMEW A. KANE
STATE LIBRARIAN

STATE OF HAWAII
DEPARTMENT OF EDUCATION
HAWAII STATE PUBLIC LIBRARY SYSTEM
485 SOUTH KING STREET, 8-1
HONOLULU, HAWAII 96813

OFFICE OF THE STATE LIBRARIAN

March 23, 1993

John C. Lewin, M.D., Director
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801

Dear Dr. Lewin:

SUBJECT: Kihei Public Library

Thank you for your February 5, 1993 letter on the subject project. Our responses to your comments are as follows:

1. In reference to the December 16, 1992 letter from Mr. David Nakagawa of your Department, we note that the Kihei Fire Station and Kalama Park should not have an adverse noise impact on the library. The fire station may generate noise for brief but intense periods of time during emergency situations. The activities of the park should not adversely affect library operations. The library structure will be air conditioned and the site will have a boundary wall and landscaping to provide a buffer. Also, use of public restrooms and parking stalls on the property should be limited to library patrons. The boundary wall should aid in restricting usage to library patrons. Signs also could be erected noting that use of the property would be restricted to library patrons.
2. Our intent is to connect the County sewer service system. We will work with County Department of Public Works on an allocation of sewer capacity as part of the building permit process.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

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

Sincerely,

Joseph Bartholomew A. Kane
Joseph
Bartholomew A. Kane
State Librarian



References

REFERENCES

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

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.

State of Hawaii, Department of Business and Economic Development, Data Book, 1990.

University of Hawaii, Department of Geography, Atlas of Hawaii, Second Edition, 1983.

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, 1972.

Appendices

Appendix A

**Executive Order No. 3058
and BLNR Decision of
April 26, 1991 Amending
Executive Order No. 3058**

Executive Order No. 3012

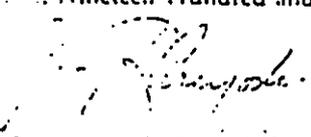
Setting Aside Land for Public Purposes

By this Executive Order, I, the undersigned, Governor of the State of Hawaii, by virtue of the authority in me vested by Section 171-11, Hawaii Revised Statutes, and every other authority me hereunto enabling, do hereby order that the public land hereinafter described be, and the same is, hereby set aside for the following public purposes:

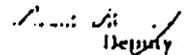
FOR USE AS A PARK SITE, to be under the control and management of the County of Maui, all of the land situate at Kamaole, Wailuku (Kula), Maui, Hawaii, being designated as Addition to Kalama Park, containing an area of 1.930 acres, more particularly described in Exhibit "A" and delineated on Exhibit "B", both of which are attached hereto and made parts hereof, said exhibits being, respectively, a survey description and a survey map prepared by the Survey Division, Department of Accounting and General Services, State of Hawaii, both being designated C.S.F. No. 19,109 and dated January 27, 1981.

SUBJECT to disapproval by the legislature by two-thirds vote of either the Senate or the House of Representatives or by majority vote of both, in any regular or special session next following the date of this Executive Order.

In Witness Whereof, I have hereunto set my hand and caused the Great Seal of the State of Hawaii to be affixed.
Done at the Capitol at Honolulu this 27 day of
January, Nineteen Hundred and 1981


Governor of the State of Hawaii

Approved as to form:


Deputy Attorney General

Dated: 27 January, 1981

State of Hawaii
Office of the Lieutenant Governor

This is to Certify That the within is a true copy of Executive Order No.....
setting aside land for public purposes, the original of which is on file in this office.

In Testimony Whereof, the Lieutenant Governor of the
State of Hawaii, has hereunto subscribed his name
and caused the Great Seal of the State to be affixed.

DONE in Honolulu, this day of
..... A.D. 19.....

Executive Order No. _____

**Setting Aside Land for
Public Purposes**

Land
.....
Purpose
.....
Date





STATE OF HAWAII
SURVEY DIVISION

DEPT. OF ACCOUNTING AND GENERAL SERVICES January 27, 1981
HONOLULU

C.S.F. No. 19,109

ADDITION TO KALAMA PARK

Kamaole, Wailuku (Kula), Maui, Hawaii

Being a portion of the Government Land of Kamaole.

Being also Lots 68, 70, 72, 74 and a portion of Lot 76
of Waiohuli-Keokea Beach Lots, 2nd Series.

Beginning at the northeast corner of this parcel of land,
the northwest corner of Kihai Fire Station Site (Governor's Executive
Order 2595) and on the south side of Waimahaihai Street, the coordinates
of said point of beginning referred to Government Survey Triangulation
Station "PUU-O-KAU" being 1,548.78 feet North and 22,976.66 feet West,
thence running by azimuths measured clockwise from True South:-

1. 354° 04' 30" 225.00 feet along Kihai Fire Station Site
(Governor's Executive Order 2595);
2. 84° 04' 30" 373.61 feet along Kalama Park (Governor's Execu-
tive Order 854);
3. 174° 04' 30" 225.00 feet along Grant 13587 to James W. Cameron,
Grant S-13963 to Takao and Masaya N.
Suda and Grant 12733 to Rose C. Zane;
4. 264° 04' 30" 373.61 feet along the south side of Waimahaihai
Street to the point of beginning and
containing an AREA OF 1.930 ACRES.

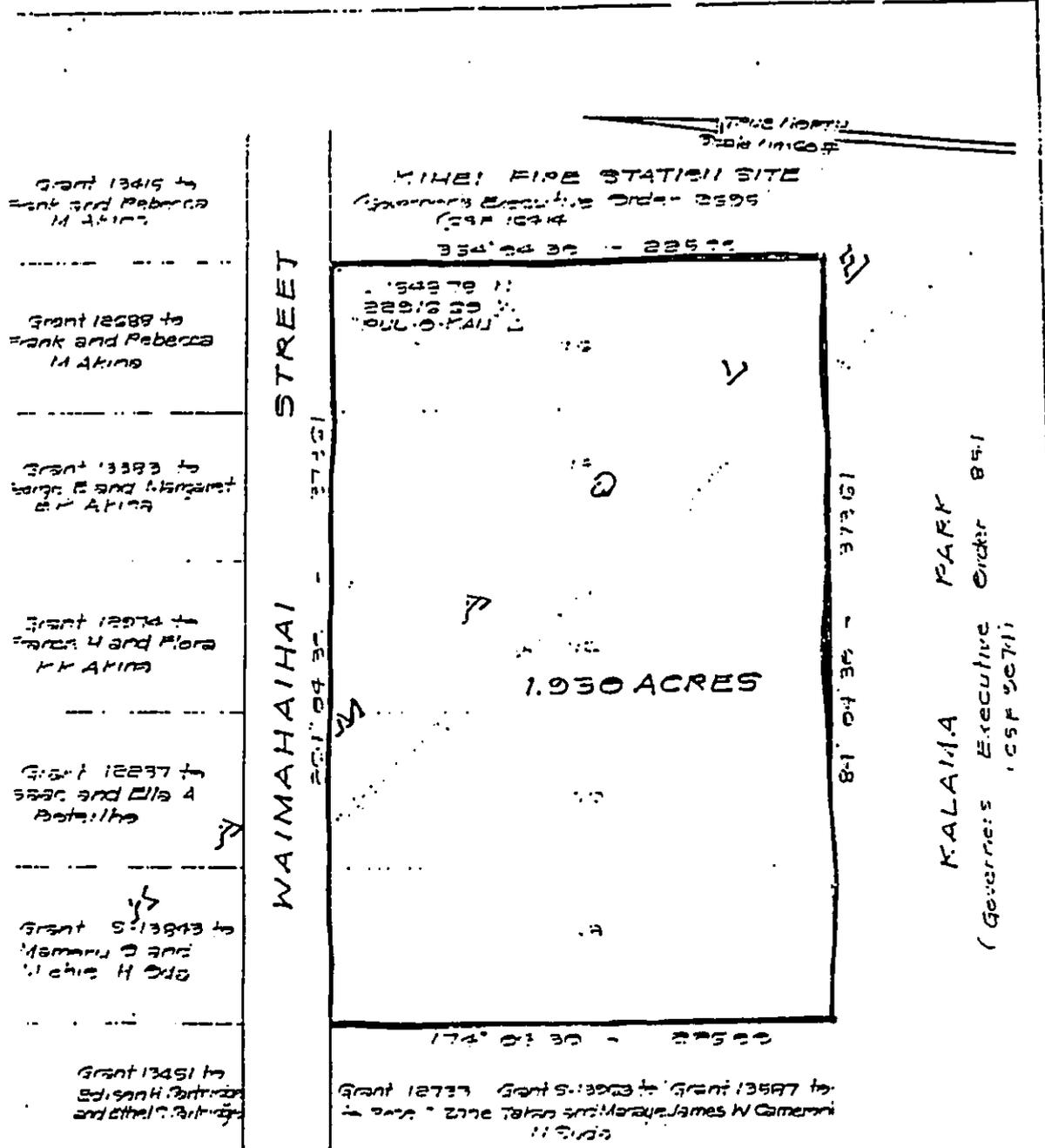
SURVEY DIVISION
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
STATE OF HAWAII

By: Stanley Hasegawa
Stanley Hasegawa
Land Surveyor

ac

Compiled from HTS Plat 1071-A,
CSF 16414, 18222 and Govt.
Survey Records.

EXHIBIT "A"



ADDITION TO KALAMA PARK
 Kamaele, Wailuku (Kula), Maui, Hawaii
 Scale: 1 inch = 200 feet

EXHIBIT "B"

JOHN WAINHE
GOVERNOR OF HAWAII

(01)

AGRICULTURE DEVELOPMENT
PROGRAM
AQUATIC RESOURCES
CONSERVATION AND
ENVIRONMENTAL AFFAIRS
CONSERVATION AND
REGULATION ENFORCEMENT
CONSERVATION
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF LAND MANAGEMENT
P. O. BOX 481
HONOLULU, HAWAII 96808

April 26, 1991

Board of Land and
Natural Resources
State of Hawaii
Honolulu, HI

MAUI

Subject: Cancellation of Governor's Executive Order No. 3058 and Reset Aside to Department of Education for "New Kihei Public Library Site" at Kamaole, Wailuku, (Kula), Maui; Tax Map Key: 2nd Div./3-9-12:13.

STATUTE: Section 171-11, Hawaii Revised Statutes, as amended

APPLICANT: DEPARTMENT OF EDUCATION, Hawaii State Public Library System

FOR: Set aside a portion of the Government Land of Kamaole, being Lots 68, 70, 72 and 74 and a portion of Lot 76, Waiohuli-Keokea Beach Lots, 2nd Series, situate at Kamaole, Wailuku (Kula), Maui, Hawaii, and being also that certain parcel of land identified by Tax Map Key: 2nd Div./3-9-12:13, as shown outlined in red on C.S.F. No. 19,109 survey map whiteprint and Tax Map Plat: 2nd Div./3-9-12 labeled Land Board exhibits "A" and "B," respectively, appended to the basic file.

STATUS OF LAND TITLE: Subsection 5(b) land of the Hawaii Admission Act

STATUS: Land is presently set aside and under the control and management of the County of Maui through Governor's Executive Order No. 3058 dated June 10, 1981 for use as a park site designated as "Addition to Kalama Park."

ZONING: State Land Use Commission: Urban District
County of Maui: Park; however, the County of Maui has stated that the intended zoning will be public/quasi-public use within which a public library is a permitted use.

APPROVED BY THE BOARD OF
LAND AND NATURAL RESOURCES
AT ITS MEETING HELD ON
APR 26 1991

ITEM F-4

LAND AREA: . 1.930 acres, more or less.
PURPOSE: Set aside to the Department of Education,
Hawaii State Public Library System for "New
Kihei Public Library Site."

IMPROVEMENTS: None

REMARKS: The proposed site of the Department of Education, Hawaii State Public Library System's (DOE) new Kihei Public Library is presently set aside to the County of Maui under Governor's Executive Order No. 3058 dated June 10, 1981 for use as a park site designated as Addition to Kalama Park. However, due to a lack of adequate funding, the County of Maui's Department of Parks and Recreation has not proceeded with plans to improve this park site with park and recreation facilities. At present, the subject State-owned parcel remains overgrown with brush and Kiawe trees.

Recently, an environmental document titled Draft Environmental Impact Statement for Site Selection for the New Kihei Public Library, Kihei, Maui (Draft EIS) was prepared by Fukunaga and Associates, Inc. for the State Department of Accounting and General Services, for an on behalf of the DOE. This Draft EIS was prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes (relating to Environmental Impact Statements) and Title 11, Chapter 200, Department of Health Administrative Rules.

The Draft EIS incorporates the methodology and results of the Site Selection Report which was prepared to identify the most suitable sites for the proposed new Kihei Public Library. Five (5) candidate sites located within the Kihei area were identified in the Site Selection Report. Based on identification and comparisons of the relative advantages and disadvantages of each of the five (5) sites, and other information presented in the Site Selection Report, the Hawaii State Public Library System has selected the subject State-owned parcel, located adjacent to the existing Kalama Park, as the site of the new public library in Kihei, Maui.

The County of Maui has voiced no opposition to allowing use of the subject site for a new public library facility that will eventually replace the existing Kihei Public Library station and enhance library services to residents in the Maalaea, Kihei, Wailea and Makena areas on the Island of Maui.

RECOMMENDATION: That the Land Board:

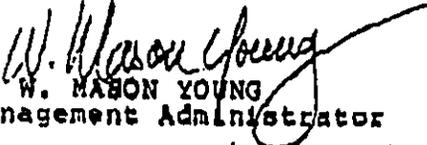
- A. Approve of and recommend to the Governor of Hawaii issuance of an Executive Order cancelling Governor's Executive Order No. 3053 dated June 10, 1981 to the County of Maui for "Addition to Kalama Park," subject to disapproval by the State Legislature in any regular or special session next following the date of the Executive Order; and
- B. Approve of and recommend to the Governor of Hawaii issuance of an Executive Order to set aside the subject-owned parcel to the Department of Education, Hawaii State Public Library System for the "New Kihei Public Library Site," subject to the following terms and conditions:
 1. Disapproval by the State Legislature in any regular or special session next following the date of the Executive Order;
 2. Compliance with all applicable Federal, State and County laws, ordinances, rules and regulations relative to the occupancy and use of the set aside lands; and
 3. Such other terms and conditions as may be prescribed by the Chairperson.
- C. Until the issuance of a Governor's Executive Order resetting aside the subject State-owned premises to the DOE for the "New Kihei Public Library Site," grant an immediate right-of-entry to the State Department of Accounting and General Services, Public Works Division (DAGS), its agents, officers, employees, consultants, contractors and/or vendors to said premises for the purpose of planning, designing and constructing the new Kihei Public Library facility, subject to the following terms and conditions:
 1. DAGS, its agents, officers, employees, consultants, contractors and/or vendors shall at all times with respect to the premises use due care for public safety and agree to indemnify, defend and hold harmless the State of Hawaii from and against all claims or demands for damage, including claims for property

damage, personal injury or death, arising on or about the premises, or by any fire or explosion, thereon, or growing out of, or caused by any failure on the part of DAGS, its agents, officers, employees, contractors and/or vendors to maintain the premises in accordance with the terms and conditions of this right-of-entry permit;

2. DAGS, its agents, officers, employees, consultants, contractors and/or vendors shall observe and comply with all applicable statutes, laws, ordinances, rules and regulations of the Federal, State and County governments relative to and affecting the premises;
3. DAGS, its agents, officers, employees, consultants, contractors and/or vendors shall cease work and immediately notify the State Historic Preservation Program Office in Honolulu at 587-0047 in the event that any unanticipated historic site(s) or any archaeological remains are encountered during construction work performed on or within the premises;
4. DAGS, its agents, officers, employees, consultants, contractors and/or vendors shall keep the premises in a clean, sanitary, and orderly condition;
5. DAGS, its agents, officers, employees, consultants, contractors and/or vendors shall not make, permit, or suffer, any waste, strip, spoil, nuisance or unlawful, improper or offensive use of the premises;
6. DAGS, its agents, officers, employees, consultants, contractors and/or vendors shall be responsible for clearing and removing all materials and debris generated during and resulting from the construction work performed on or within the premises;
7. No open burning of any type shall be permitted on or within the premises;

8. DAGS shall notify the Maui District Land Agent prior to the start and also upon completion of any construction work on or within the premises; and
9. Such other terms and conditions as may be prescribed by the Chairperson.

Respectfully submitted,


W. MASON YOUNG
Land Management Administrator

APPROVED FOR SUBMITTAL:


WILLIAM W. ZATY, Chairperson

Appendix B

Archaeological Inventory Survey

Report 765-113090

Archaeological Inventory Survey Potential Kihei Public Library Site D

Land of Kamaole, Wailuku District
Island of Maui (TMK:3-9-12:13)

by

Theresa K. Donham, M.A.
Supervisory Archaeologist

Prepared for

State of Hawaii
Department of Accounting and General Services
c/o Fukunaga & Associates
1388 Kapiolani Blvd., 2nd Floor
Honolulu, Hawaii 96814

December 1990

PHRI

Paul H. Rosendahl, Ph.D., Inc.

Archaeological • Historical • Cultural Resource Management Studies & Services

305 Mohouli Street • Hilo, Hawaii 96720 • (808) 969-1763 • FAX (808) 961-6998
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SUMMARY

At the request of Mr. Royce S. Fukunaga of Fukunaga & Associates, Inc., representing the State of Hawaii - Department of Accounting and General Services, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological inventory survey of the approximately 1.93-acre potential Kihei Public Library Site D, located at Kihei, in the Land of Kamaole, Wailuku District, Island of Maui (TMK:3-9-12:13). The survey was conducted November 14, 20, and 24, 1990. Field work consisted of a total surface pedestrian survey and a subsurface auger coring.

All cultural material identified during the surface survey appeared to be secondary refuse, deposited within the modern era (post-1940). The majority of the refuse observed was most likely deposited within the last twenty years. No archaeological sites were recorded during the surface survey. Two features previously identified as possible archaeological features were relocated and determined to be portions of a

relatively long secondary deposit of pushed soil and disturbed structural stone derived from an unknown source.

No cultural deposits or non-recent cultural materials were located during the subsurface survey, which consisted of 14 systematically spaced auger corings.

Findings of the surface and subsurface survey indicate that there is a relatively undisturbed sand dune formation in the western portion of the project area. No cultural remains were identified here during auger coring; however, subsurface deposits and features such as human burials are known to be present in coastal dunes. If this natural feature is modified in the process of property development, archaeological monitoring is recommended. Monitoring is also recommended if the secondary deposit of structural material is moved, in order to determine if possible intact portions of a feature, such as a wall, are present beneath the deposit.

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INTRODUCTION

BACKGROUND

This report presents the results of an archaeological inventory survey conducted at the potential Kihei Public Library Site D, located at Kihei in the Land of Kamaole, Wailuku District, Island of Maui (TMK-3-9-12:13). The survey was conducted by Paul H. Rosendahl, Ph.D., Inc. (PHRI) at the request of Mr. Royce S. Fukunaga of Fukunaga & Associates, Inc., on behalf of their client, the State of Hawaii - Department of Accounting and General Services. The overall purpose of the survey was to make a general assessment, in conjunction with the preparation of an Environmental Impact Statement (EIS), concerning the presence or absence of, and potential impacts of the project on, any sites of possible archaeological significance within the project area.

Surface survey of the 1.93-acre parcel was conducted November 14, 1990; subsurface survey consisting of 14 systematically spaced auger corings, was conducted November 20 and 26, 1990. All field work was conducted by Supervisory Archaeologist Theresa K. Donham, M.A., and Supervisory Archaeologist Diane Guerriero, B.A. Twenty-seven labor-hours were expended during the field work portion of the survey.

Described in this final report are project objectives and the scope of work, field methods and procedures, and survey findings. Also included is background information, such as previous archaeological work and historic documentary research. Recommended further actions are also discussed.

SCOPE OF WORK

The basic purpose of an inventory survey is to identify—to discover and locate on available maps—all sites and features of potential archaeological significance. An inventory survey is extensive rather than intensive in scope, and is conducted basically to determine the presence or absence of archaeological resources within a specified project area. This level of survey indicates both the general nature and variety of archaeological remains present, and the general distribution and density of such remains. It permits a general significance assessment of the archaeological resources and facilitates formulation of realistic recommendations and estimates for any subsequent mitigation work as might be necessary or appropriate. Such work could include further data collection involving detailed recording of sites and

features, and selected test excavations; and possibly subsequent data recovery research excavations, construction monitoring, interpretive planning and development, and/or preservation of sites and features with significant scientific research, interpretive, and/or cultural values.

The basic objectives of the present inventory survey were: (a) to identify all sites within the project area; (b) to evaluate the potential general significance of all identified resources; (c) to determine the possible impacts of proposed development on the identified resources; and (d) to define the general scope of any subsequent data collection and/or other mitigation work that might be necessary or appropriate.

Based on a review of available background literature, general familiarity with the Kihei/Kula area, and based on discussions with Mr. Fukunaga of Fukunaga & Associates, the following specific tasks were determined to constitute an appropriate scope of work for the survey:

1. Conduct limited archaeological and historical documentary background research involving review and evaluation of readily available archaeological and historical literature, historic documents and records, and cartographic sources relevant to the immediate project area;
2. Conduct a 100%-coverage surface survey of the entire project area;
3. Conduct limited subsurface testing (by hand-powered coring tools) of appropriate and accessible portions of the project area (a) to determine the presence or absence of potentially significant buried cultural features or deposits, and (b) to obtain suitable samples for age determination analyses; and
4. Analyze background and field data, and prepare appropriate reports.

PROJECT AREA DESCRIPTION

The potential Kihei Public Library Site D is a 1.93-acre undeveloped property situated at the northern end of Kalama

Beach Park (Figures 1 and 2). It is bounded on the north by Waimahaihai Street, on the west by Kihei Fire Station, on the south by Kalama Park, and on the east by private residences. The parcel is rectangular and measures approximately 68.6 m N-S by 113.9 m E-W. The exact elevation of the project area could not be determined from available maps; it appears to range around 3.0 m above mean sea level (AMSL). The surface elevation of most of the project area is currently below that of the adjacent parcels to the south and east, which have apparently been filled for development. Remnants of three shallow drainage channels cross the property on a north-south axis. A linear dune formation, also oriented north-south, is present at the western end of the property. The dune rises an average of 1.50 m above the level of most of the project area.

The project area is situated approximately 105.0 m from the shoreline, and approximately 70.0 m south of the Keokea-Kamaole Ahupua'a boundary. In terms of traditional Hawaiian settlement patterns, the project area is within the coastal settlement zone, a band generally defined as extending 400-600.0 m inland of the shoreline. This zone was utilized for permanent and temporary habitation in conjunction with a variety of subsistence and economic activities. Subsistence activities included plant cultivation, livestock husbandry, fishing, aquaculture, and marine and terrestrial plant gathering. Ceremonial and burial sites were located in the coastal zone, and were most common in or near the areas of aggregated permanent habitation.

The climate of the Kihei area is characteristically hot and arid, with day time temperatures ranging between 80 and 90 degrees F, and night temperatures between 70 and 75 degrees F. Annual rainfall averages around 10-12 inches.

The low-lying portion of the project area, which comprises c. 75-80% of the project area, is within the 100-year flood hazard zone. The ground water level is relatively shallow here, and is subject to rising after moderate amounts of rainfall. During the subsurface survey, which was conducted during and immediately after a brief period of rainfall, ground water entered all auger corings located in low lying areas. The surface of the water table ranged from 0.93 to 1.45 m below ground surface.

The Soil Conservation Service includes the project area within a zone of dune lands, which consists of hills and ridges of drifting aeolian sand (Foote et al. 1972:29). In general, the sand which comprises dune land is derived from coral and marine shells; it generally remains unfixed, and soil horizons are undeveloped. The coralline dune land is most evident in

the western portion of the project area. The low-lying portion of the project area contains a surface deposit of alluvial silts and clays, which overlie layers of cemented sand and submerged coarse beach sands. This deposition is discussed in further detail below.

Vegetation within the project area consists predominantly of koa-haole (*Leucaena leucocephala* [Lam.] de Wit) and kiawe (algaroba, *Prosopis pallida* [Humb. and Bonpl. ex Wild.] HBK). Most of these trees are mature, and several are quite large. A number of the larger trees appear to be on the verge of falling, or have fallen. In addition to the naturally fallen trees, push-piles of kiawe are present around the perimeter of the project area, and are a major impediment to access. In general, kiawe deadfall or push piles cover approximately 40% of the total surface area of the project area. Ground cover is relatively sparse over most of the open portions of the project area, and a surface duff layer of kiawe beans and leaf litter is present. There are numerous patches of grass, and small vine plants.

Due to its proximity to residential and commercial areas, the project area has been subjected to repeated use as a refuse dump site. Piles of recent trash in plastic bags and discarded vegetation from lawn maintenance lie along the north and west boundaries; abandoned junk cars and equipment are present along the east boundary, and park-related debris is scattered along the south boundary. The drainage channel along the eastern side of the dune formation has been used as a small-scale landfill dump. The interior of the project area is littered with remains of semi-permanent camp sites, and miscellaneous rubbish. The area is frequented by the neighborhood children, who have constructed various play areas under the kiawe and koa-haole canopy.

PREVIOUS ARCHAEOLOGICAL WORK

Project Area

In 1981, Mr. Charles Keau conducted a surface survey of the 1.93 acre project area, at the request of Mr. Nolle R. Smith, director of the State of Hawaii - Department of Parks and Recreation (Keau 1981). Two features were identified by Keau and described as being "possible archaeological features.". Both features were located at the northeast corner of the property and were designated as Features A and B of Site 1.

Feature A, interpreted as a possible ko'a, or fishing shrine, was located on a "mound of mixed dirt and sand," and

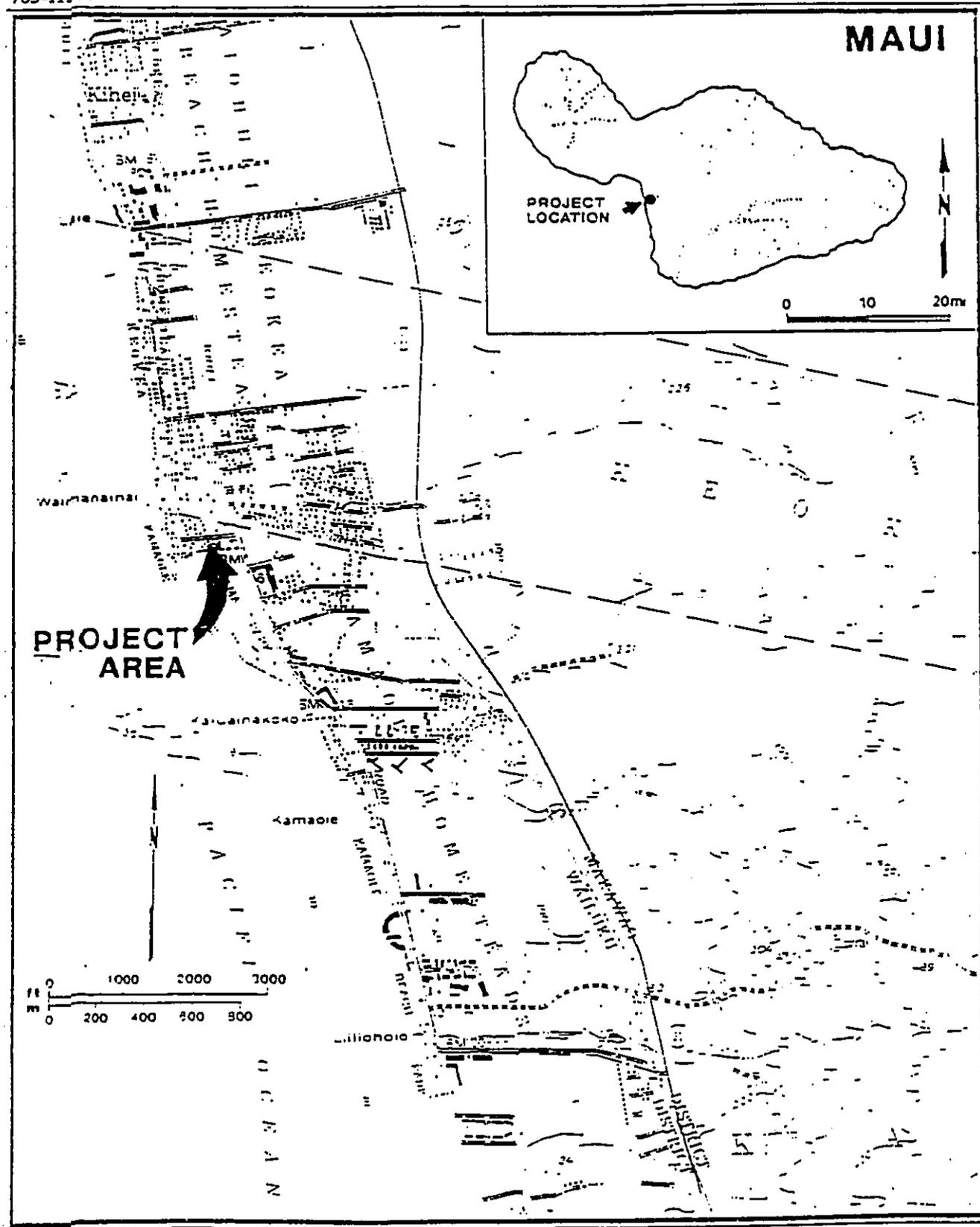


Figure 1. PROJECT LOCATION MAP

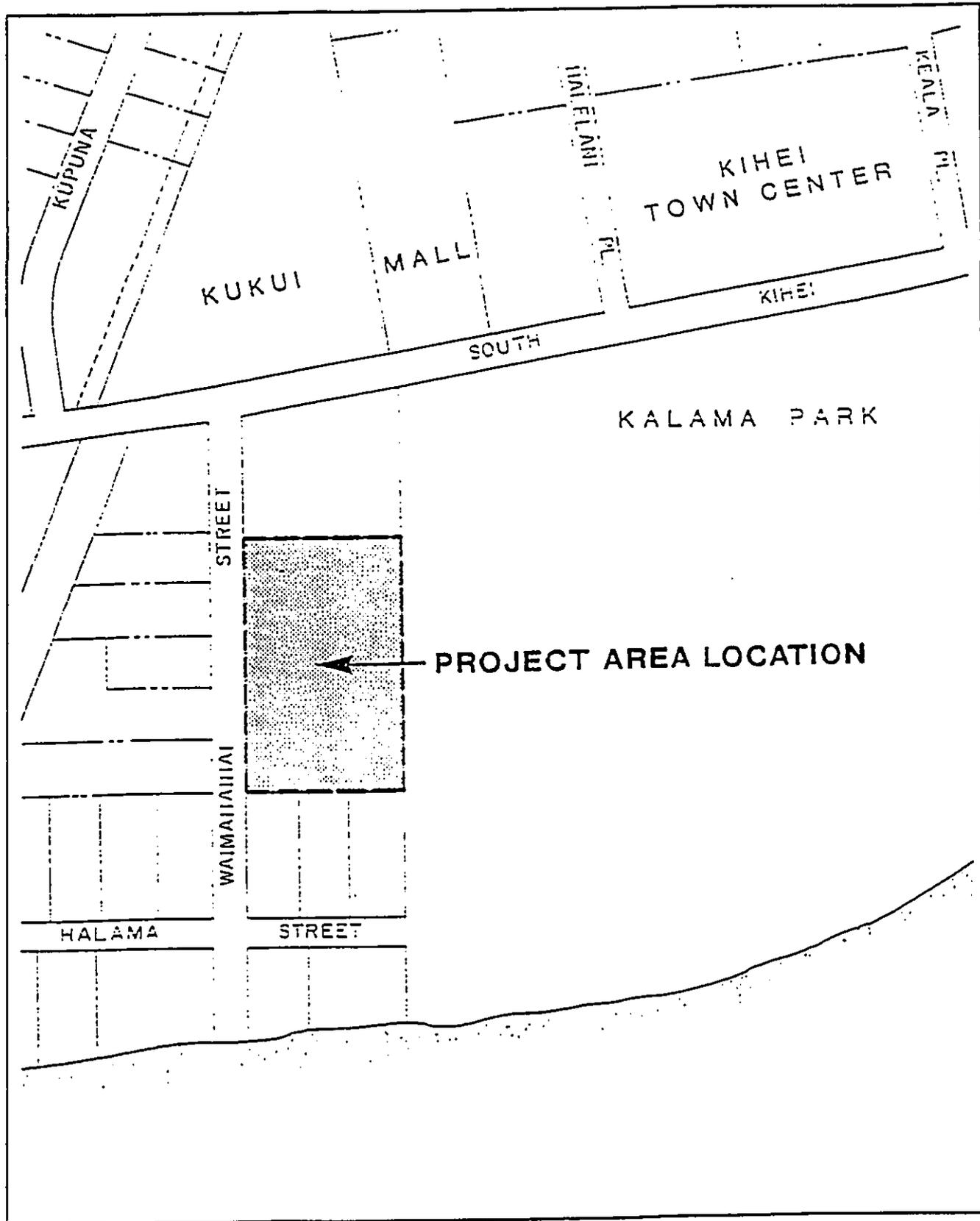


Figure 2. PROJECT AREA LOCATION MAP

is described as follows:

The south wall is a single stone alignment. Approximate measurement is 3.7 m length by 40 cm in height. Stones are porous lava, and the sizes range from 'baseball' to 20 x 30 cm. With the exception of two stones; the southeast corner stone measures 70 x 60 x 50 cm and 25 cm thick. On the right top corner are markings or scratches that are caused by heavy equipment...The other stone I know is a Kii. A possible Ku'ula Pohaku. Its measurements are 60 x 20 x 25 cm. Along the base of this stone are two corals, and on the corner of this structure is a broken piece of branch coral (Keau 1981:1).

Feature B was located approximately 10 m southwest of Feature A, and consisted of a stone alignment 1.7 m long and c. 0.4 m wide. Keau notes that, "Like Feature A, historic artifacts are found on the surface - papers, plastic pipe, bottles and some other. No midden or prehistoric artifacts found" (Keau 1981:2).

Based on his findings, Keau recommended that the project area be more closely examined by professional archaeologists. He also recommended that the features be tested in order to determine significance. These features and their depositional context are discussed in the findings section.

Kamaole

Prior to the enactment of cultural resource management laws, very few site inventory surveys were conducted in east Maui. Principal among the early site inventories for the Island of Maui was Walker's (1931) survey, which identified 266 heiau and petroglyph sites. Walker identified only two sites (198, 199) along the entire coastline from Maalaea to Makena. These were associated with a fishpond located near Keawakapu, south of Kihei (1931 map). Three heiau sites were, however, recorded in the uplands of Kamaole, between 2,000 and 3,000 ft AMSL (Walker 1931). These included Wailuku Heiau (Site 205), Kolea Heiau (Site 206) and Site 207, name unknown (Walker 1931).

Wailuku Heiau had been previously described by Thrum (see Appendix for quotation), and according to Walker, had been later used as a house site. It was reported to Walker that Wailuku was a sacrificial heiau and that drums were heard at the site on the nights of Kane. Kolea Heiau, also previously

reported by Thrum, was described by Walker as a large, L-shaped enclosure with terraced sides and an interior platform and an open, unpaved court. The Site 207 heiau was described as being near Wailuku Heiau and consisting of a small platform (Walker 1931).

Walker's survey, other less extensive surveys, and excavations conducted in Maui County prior to 1970 were summarized by Emory and Hommon (1972) in a broad cultural resource management plan prepared for the County of Maui. At the time of their study, Emory and Hommon reported that there were eight development projects comprising over 50 acres in progress along the coast in Kamaole (Emory and Hommon 1972:33). Archaeological research, consisting of excavation at one C-shaped structure, was recommended for only one of these development projects.

Two previous reconnaissance surveys have included relatively small portions of land in lower Kamaole. The earliest of these was a reconnaissance survey of the proposed Piilani Highway corridor, which is located approximately 0.8 km inland of the eastern boundary of the project area. This corridor was examined by Cox (1976), who located two C-shapes in Keokea, and a small cave near the northern end of Kamaole (Site 224). Cox recovered volcanic glass dated at AD 1724-1784 from a small cave in Kamaole (Cox 1976).

The following year, Cordy conducted a survey of nine drainage gullies and an inland corridor through the barren scrub zone between Kealia Pond and Wailea (1977). His survey corridor through Kamaole incorporated a strip 300-350 ft wide, along the makai side of the Piilani Highway corridor, and both sides of a major drainage channel at the southern end of Kamaole. Cordy located 12 sites within Kamaole, including four historic cart or horse trails or paths (Sites 1716, 1718, 1719, and 1721), four additional historic period features such as ranch walls, water ditches, etc. (Sites 1713, 1714, 1717, and 1720), three prehistoric period temporary habitation sites (1715, 1723 and 1724), and one prehistoric site of unknown function (Site 1722).

Site 1715 was located near the northern border of Kamaole, approximately 152.0 m makai of Cox's Site 224. Cordy described Site 1715 as consisting of three C-shaped structures.

Kihei/Wailea/Makena Area

Two reconnaissance surveys were recently conducted for housing development projects along the makai side of Piilani Highway, in Keokea and Waiohuli, immediately north of Kamaole (Donham 1989, 1990a). In Keokea, 13

new sites and three of Cordy's 1977 survey sites were identified within a 74-acre project area. Among the 30 features recorded during that survey nine were terraces, seven were enclosures, four were C-shapes, four were rock piles, two were midden scatters, one was an alignment, and one was a modified outcrop (Donham 1990a). Additional data recovery was recommended for six of the Keokea sites.

In Waiohuli, a 114-acre project area between Piilani Highway and the existing subdivision was surveyed. Five new sites and two previously identified sites were located; they consisted of six alignments, two rock piles, two cairns, a bifaced wall segment, and historic structural remains (Donham 1989). Additional testing was recommended and was later conducted at a cairn site (Site 2475) thought to be a possible burial monument. The site was found to be a component feature of a hillside terrace system used for dryland agriculture (Donham 1990b).

Since 1970 numerous archaeological studies have been conducted along the coastal portion of Wailuku and Makawao Districts. These studies, in conjunction with resort development, are concentrated in the Wailea/Makena area, located approximately three miles south of the project area. One of the earliest contract projects in the Wailea/Makena area was Kirch's survey and subsequent excavations at Palauea (Kirch 1969, 1970, 1971). Kirch's analysis of two coastal site complexes (SIHP Sites 1028 and 1029) offered hypotheses regarding pre-contact period settlement patterns, subsistence, and social organization for leeward east Maui (Kirch 1971).

Kirch proposed that coastal settlement along the arid coastline of Palauea was non-permanent, or transient, and was primarily for purposes of gathering sea resources. Permanent habitation sites were hypothesized to have been in upland resource zones, where intensive agriculture was conducted (Kirch 1971:83-85). Kirch also hypothesized that the residential complex examined (Site 1028) was probably occupied by a single descent group, whereas the heiau site (1029) was probably used or upkept by all occupants of the ahupua'a (Kirch 1971:83-85). A single radiocarbon date range (AD 1545-1745) was assayed from a charred post excavated at Site 1028 (Kirch 1971:76).

Subsequent to Kirch's study, a number of reconnaissance and testing projects have been conducted in the Wailea/Makena area (Barrera 1974; Barrere 1975; Bordner 1980;

Bordner and Cox 1982; Clark 1974; Cleghorn 1974, 1975; Cordy 1978; Dicks and Haun 1987; Dobyns 1988; Donham 1990c,d; Haun 1978, 1988; Hommon 1975; Jourdane and Sinoto 1979; Schilt and Dobyns 1980; Shapiro and Haun 1988; Sinoto 1978; Walker, Rosendahl, and Haun 1985). These studies have been summarized and discussed in a report recently completed by Donham (1990c).

SUMMARY OF HISTORIC DOCUMENTARY RESEARCH

Historic background studies conducted in the Wailea/Makena area include an overview of Wailea and the Kula District by Barrere (1975), a regional political history with specific reference to the Makena area, by Cordy and Athens (1988), and two background studies of Palauea and Makawao District (Yoklavich 1988, Kalima and Wong-Smith 1990). In the Kihei area, historic background information, primarily focused on Land Commission Awards, was compiled by Cox (1976) and Cordy (1977). Similar studies for Keokea and Waiohuli were completed by EISC (1982) and Wong Smith (1990). Background information regarding Kamaole has been compiled by Kalima and is presented in the Appendix.

Kalima's report discusses the following topics: legendary references to Makawao and Kamaole, Thrum's listing of Kamaole heiau sites, general cultivation practices for the region, land tenure in Kamaole, and background information on Kalama Park.

Kamaole Ahupua'a was designated as Government Land during the Mahele of 1848, and was apparently used primarily for the keeping of government cattle. Numerous small parcels were sold or leased within the ahupua'a; some of these grants may date to the pre-Mahele government land sales, which were conducted for a brief period in Makawao. Cordy (1977) located, in the Mahele testimonies, at least seven coastal houselots among the Land Commission kuleana awarded in Kamaole. The individuals who were granted houselots along the coast were also awarded inland agricultural lands, consisting of Irish potato patches, taro patches, and sweet potato patches. These inland awards were described as being in kula lands or in the barren zone (Cordy 1977:70-71).

Kalima could not locate specific references to the project area regarding land grants or Land Commission Awards.

FIELD METHODS AND PROCEDURES

A 100% surface pedestrian survey was conducted at the project area November 14, 1990, by the report author. The survey commenced at the northeastern corner of the property and consisted of parallel sweeps, oriented north to south and south to north. Each sweep was marked with pink flagging tape in order to insure complete coverage of the area. The northern and southernmost areas of most sweeps were covered with piled vegetation and debris, making surface observation impossible. The surface was generally visible for approximately 60% of the project area.

The subsurface survey was conducted November 20 and 26, 1990, by one or two persons. It consisted of excavating 14 hand-powered auger cores, spaced at 15.0 to 20.0 m intervals on a grid system. The cores were numbered consecutively, beginning at the northeastern corner of the grid pattern (Figure 3). The north-south lines were oriented 330-150 degrees Az., and the east-west lines were oriented 60-240 degrees Az. In some areas, the locations of cores had to be adjusted due to large kiawe deadfall piles.

The coring tool used produced holes 0.08 m in diameter, and collected soil column sections approximately 0.20 m long. Coring holes were excavated to depths ranging from 0.37 to 2.13 m. Average coring depth was 1.34 m.

During auger core excavation, all soil removed was screened through 1/8" mesh hardware cloth. Each soil layer encountered during excavation was identified and described on standard PHRI Soil Stratigraphy forms. The depth range,

thickness, moist and dry color, texture, structure, consistence and inclusions present in each layer were recorded, in addition to any notes on cultural layers, portable remains, deposition and the specific setting of the core location. Soil descriptions followed U.S. Soil Conservation Service soil description guidelines, and the Munsell Color Notation was used for color identification. The "water level" as used here refers to the level of the standing water that immediately seeped into and partially filled the open coring holes.

All auger holes were excavated until they had to be terminated due to excessive slumpage and water infilling, or due to impenetrable cemented sand or rock(s). Two of the corings were terminated due to rocks; three were terminated at impenetrable cemented sand or possible buried (and submerged) reef formations; all others were excavated as deep as allowable into the groundwater zone. All holes were backfilled upon completion of the stratigraphy forms and measuring of the water level.

The soil screened during auger core excavation was examined for portable artifacts, faunal remains, and charcoal. Recent bottle glass was noted and discarded, as were faunal remains determined to be natural inclusion in the sand. No materials were observed that warranted collection.

After completion of the systematic pedestrian survey, the previously located features (Keau 1981) were cleared and examined. An additional portion of one feature—a portion that had not been previously described—was also cleared and examined. The previously located features were described on standard PHRI Feature Record Forms.

FINDINGS

SURFACE FINDINGS

A single feature worth note was located during the surface survey. It consists of a what appears to be a secondary deposit of structural remains, located along the northern edge of the project area (Figure 3). The deposit is a generally low, linear mound of mixed sand and dirt that contains subangular and vesicular basalt boulders and cobbles, waterworn coral cobbles and pebbles, beach conglomerate cobbles, and branch coral; also, waterworn basalt boulders, cobbles, and pebbles, and much modern rubbish.

The mound is 77.5 m long and 3-8.0 m wide. Maximum width is at the eastern end, which is located 11.0 m west of the northeastern corner of the project area. The western end is 26.0 m from the northwestern corner of the property. Maximum height of the mound from the surface of Waimahaihai Street is 1.38 m, as measured with an eye level. At the eastern end of the mound, a deposit of road surfacing gravel and broken pieces of structural concrete appears to be eroding from the base. From the eastern end, boulders, cobbles and miscellaneous concrete pieces are scattered in a linear pattern to the south, and appear to be the trailings of a bulldozer cut that went through the mound, possibly to make an access road along the eastern edge of the property.

Most portions of the feature were covered with rubbish, lawn trimmings, and deadfall, and considerable effort was made to follow the entire extent of the mound in search of possible structural remnants. Three areas of relatively concentrated stone and traces of disturbed alignment-like patterns were observed. These areas were situated around trees, and the clustering appeared to be caused, at least in part, by the tree roots. One of these areas included the previously identified features described by Keau (see Previous Archaeological Work).

The feature (A) described by Keau as a possible shrine was located at the eastern end of the linear mound, where the mound is broadest and highest. The area around the feature was cleared of vegetation, and it was discovered that the stone pattern mapped by Keau was actually a small portion of a much larger scattering of boulders and cobbles. The stone described as a Kii was no longer in the position as mapped by Keau, and was lying loosely on the surface. Boulders and cobbles were scattered on the surface and were partially buried in the area between Feature A and Feature B, previously described as a possible burial alignment. The scattering of rocks and mound feature continued west from Feature B for an additional 60.0 m. Weathered coral and

branch coral, as well as waterworn cobbles, were located along the entire length of the mound; there was no concentration of coral in the Feature A locale.

The mound was examined for any traces of midden remains; none were located. Several trowel probes were made, revealing buried modern bottle glass, leather boots, rubber tires, etc. Boulders and cobbles are also buried in the deposit, which appears to have been produced by machinery.

The western end of the mound occurs at the eastern edge of the dune formation. The dune appears to have been cut at this point, either during road construction or small-scale sand borrowing. Waterworn cobbles and other structural stones are scattered at the base of the cut, and a few stones are still lodged in tree roots along the exposed dune face, suggesting that the feature may have crossed the dune. The exposed dune face here is 2.0 m above the surface of Waimahaihai Street. It was closely examined for portable remains; only modern bottle glass was located. The soil adhering to the roots of toppled trees was also examined and found to contain no portable remains.

The feature could represent the disturbed remains of a wall. Based on the size range of structural stone present, it most likely would have been a relatively wide, core-filled wall. Several long, rectangular boulders similar to the kii located by Keau are present along the length of the mound, some of which are up to 0.9 m long. There are also relatively small cobbles (core filling) and numerous subangular pahoehoe pieces, similar to those used in faced walls. It is possible that the wall was located where the mound is currently located; however, it could have also been pushed from a nearby location, most likely from the north side.

Based on the findings of the surface survey, it appears that the two features previously identified by Keau are only portions of a larger feature that consists of a secondary deposit of possibly prehistoric structural remains mixed with historic debris. The most likely interpretation of the stone structural remains, given the long, linear pattern of the feature, is that it was once a wall. It is not certain at this time whether there might be intact portions of the wall at the base of the mound. It does not, however, seem likely that there are intact portions, given the massive size of some of the boulders that are now lying loosely on the mound surface. These stones would have been at or near the wall base, if such a structure existed; they are clearly in a secondary context now.

SUBSURFACE FINDINGS

Fourteen auger cores were excavated in a systematic pattern across the project area (Table 1). The soil stratigraphy for all cores appeared to be relatively undisturbed, although it is likely that surface sand had been removed from the dune area in the vicinity of Cores 10 and 11, located immediately north of the tennis court parking area.

Two general profile types were observed; these were present in two distinct topographic zones—the dune formation and the low-lying area. Dune profiles were identified in Cores 10, 11, and 14. These profiles consist of five to seven sand layers, and include a surface layer of sand. Core 10, located along the eastern slope of the dune, contained a thin alluvial band of silty clay between 0.96 and 1.02 m below surface. Cores 11 and 14, along the upper slopes of the dune, contained no alluvial layers. The ground water level was encountered at 1.22 to 1.84 m below surface in these cores. No cultural deposits, portable remains, or carbonized materials were located in these cores.

The remaining 11 cores exhibit relatively similar profiles—a surface layer, of silty loam or silty clay loam over silty clay, which extends to an average depth of 0.67 m. Beneath the alluvial silty clay are three to five layers of sand, which grade from fine loamy sand to coarse, white sand in water. Average depth of the water level in the cores is 1.14 m, and ranges from 0.93 to 1.45 m. In general, the water level was higher in cores placed in the southwestern portion of the project area.

No cultural layers or carbonized materials were identified in the soil removed from the cores, and all portable remains located were recent. Small Echinoid pieces and small fragments of Crustacea shell were noted in sand layers; these were determined to be natural inclusions.

The soil profiles in the low-lying portion of the project area indicate that although the land was formed from aeolian and beach sand deposits, it has recently been built up by alluvium, with limited introduction of aeolian sand.

Table 1.

SUMMARY OF AUGER CORES

Core	Layer	Depth	Texture	Color	Comments
1	I	0-35	sil	5YR3/3	Surface duff, some humus
	II	35-45	sic	5YR3/3	Large peds, plastic
	III	45-59	sl	7.5YR3/4	Sand c. 30%
	IV	59-82	ls	10YR5/6	Few pieces of Echinoid in upper 10 cm
	V	82-114	s	10YR7/6	Pieces of Crustacea, wet
	VI	114-130	s	10YR7/6	5/1 mottling, cemented peds common
	VII	130-157+	s	10YR7/3	Submerged, some cementation
2	I	0-18	sicl	5YR3/3	Surface duff
	II	18-67	sic	5YR3/4	Extremely plastic
	III	67-89	ls	7.5YR4/4	Cemented peds present
	IV	89-101	ls	10YR5/6	Loose, fine sand
	V	101-108	scl	5YR3/4	Sand/clay transition zone
	VI	108-115	sic	5YR3/2	Same as Layer II
	VII	115-118	ls	10YR5/4	Numerous cemented peds
	VIII	118-146+	s	10YR7/3	Very fine white sand, water level at -120
3	I	0-10	sil	5YR3/3	Klawe duff, humus
	II	10-35	sic	5YR3/4	Small amount of sand
	III	35-52	sic	5YR4/4	Minimal silt content
	IV	52-89	sic	7.5YR3/2	Platy peds, sand lens at base of layer, 1 cm thick
	V	89-94	sicl	7.5YR2/0	Black silt, not present in other cores
	VI	94-137+	s	10YR7/3	Fine sand with scattered coarse pieces of coral and shell; water level at -123
4	I	0-15	sil	5YR3/3	Surface duff, humus
	II	15-60	sic	5YR3/4	Medium peds, plastic
	III	60-77	cl	5YR3/2	Increase in loam
	IV	77-88	sic	5YR3/1	Distinct peds, no rocks
	V	88-100	ls	10YR3/3	Organic, mottled sand
	VI	100-115	s	10YR6/3	Fine, white sand, very wet; water level at -110
	VII	115-133+	s	10YR7/3	Submerged white sand with tiny basalt, coral pebbles
5	I	0-16	sil	5YR3/3	Surface duff, humus
	II Rock	16-79 -79	sic	5YR3/4	Medium peds, plastic
6	I	0-17	sil	7.5YR3/2	Green bottle glass sherd
	II	17-39	sic	5YR3/3	Very moist, sticky
	III	39-64	sl	10YR3/2	Few cemented peds, sand increases with depth
	IV	64-76	ls	10YR5/4	Abrupt horizon
	V	76-95	s	10YR6/4	Cemented layer 80-84; water level at -95
	VI	95-117	s	10YR7/3	Very fine sand, submerged, tiny cemented peds
	VII	117-133+	s	10YR8/2	Coarse coral sand with weathered shell fragments
7	I	0-15	sil	7.5YR3/2	Thin duff on surface
	II	15-75	sic	5YR3/4	Layers of weathered gravel at -52 and -75; lower zone mottled with darker clay
	III	75-84	s	10YR5/4	Some cemented peds
	IV	84-93	s	10YR7/4	Fine sand, very wet
	V	93-115	s	10YR7/3	Numerous pebble-size cemented peds, shell pcs; water level at -115
	VI	115-136	s	10YR6/1	Mostly cemented, submerged, numerous coarse coral and shell pieces
	VII	-136+			Impenetrable cemented sand/possible reef

Table 1. (cont.)

Core	Layer	Depth	Texture	Color	Comments
8	I	0-18	sil	5YR3/3	No duff present
	II	18-63	sic	5YR3/3	Layer of gravel 56-63
	III	63-77	st	10YR3/3	Loose, dark loam
	IV	77-80	ls	10YR4/3	Abrupt boundary
	V	80-99	ls	10YR5/3	Extremely wet, some cementation
	VI	99-115	s	10YR7/4	Fine sand, water level at base of layer, -115
	VII	115-145	s	10YR7/1	Becomes coarse, some shell, submerged
	VII	-145+			Impenetrable cemented sand/possible reef
9	I	0-25	sicl	7.5YR3/2	More clay than normal
	II	25-37	ls	10YR4/3	Small angular gravel
	Rock	.37			Appears to be basalt bedrock (?)
10	I	0-31	ls	10YR3/6	On dune formation, no duff
	II	31-96	s	10YR6/6	Medium-grain size
	III	96-10	sic	5YR4/4	Buried alluvial lens
	IV	102-111	sis	5YR4/4	Silt leached from III
	V	111-119	s	10YR5/6	Cemented layer at -115
	VI	119-146	s	10YR7/4	Coarse, heavily cemented, very wet below -122; water level at -140
	VII	-146+			Impenetrable cemented sand/possible reef
11	I	0-28	ls	10YR5/4	On dune formation, no duff
	II	28-86	s	10YR6/6	Fine, sterile sand
	III	86-115	s	10YR7/6	Coarse with coral and shell pcs., angular rock flecks
	IV	115-139	s	10YR6/1	Coarse, water level at -122
	IV	139-157+	s	10YR8/1	Coarse, weathered grains, submerged
12	I	0-10	sicl	5YR3/3	Thin surface duff
	II	10-59	sic	5YR4/3	Gravel at -43 and at base of layer, dark mottling
	III	59-66	sc	7.5YR3/4	Unusual sand/clay mix
	IV	66-70	sis	10YR4/4	Alluvial lens
	V	70-75	s	10YR6/4	Very wet, mostly cemented
	VI	75-87	s	10YR7/3	Fine, homogenous sand; water level at -93
	VII	87-125	s	10YR8/1	Coarse coral sand, grey (6/2) mottling, submerged
13	I	0-13	sicl	7.5YR3/2	Modern rubbish
	II	13-71	sic	5Y4/3	Black mottling below -65
	III	71-83	ls	10YR4/4	Cemented throughout
	IV	83-127	s	10YR6/4	Water level at -106
	V	127-140+	s	10YR7/3	Submerged, some shell fragments and cemented peds
14	I	0-11	s	10YR5/4	Humic sand-black mottling
	II	11-135	s	10YR5/6	Dune formation
	III	135-139	sis	7.5YR4/4	Thin alluvial lens
	IV	139-175	s	10YR6/4	Coarse, grain size enlarges with depth
	V	175-213+	s	10YR7/3	Water level at -184, medium grain, some tiny basalt pieces

CONCLUSION

DISCUSSION

During the surface survey of the potential Kihei Public Library Site D two previously identified features described by Keau in 1981 were relocated. Based on the present work, these features have been determined to be portions of a more extensive secondary deposit of structural stone and twentieth century rubbish. A possible interpretation for the source of the structural stone in the deposit is that it represents the remains of a bifaced, core-filled wall that was pushed over by machinery. There is no indication that the wall formed an enclosure or otherwise turned south within the project area; the wall may have functioned as a boundary. The modern ahupua'a boundary is only c. 70.0 m to the north of this feature.

It is not likely that intact portions of the original structure are present. If they are, they would not be in good condition, and would be difficult to locate unless a relatively large area of the deposit is removed. During the present project an attempt was made to excavate into the deposit by hand; however, large boulders and other materials would have required the removal of a considerable area in order to reach the base of the deposit. Such excavation would be most effectively conducted by machinery.

The subsurface auger coring did not identify any potentially significant cultural remains. The survey did, however, confirm the presence of dune formation that appears to be relatively undisturbed. The western and eastern portions of the dune have been cut into; however, the c. 20.0 m wide formation is intact across most of the project area. As

indicated in the background section, in the traditional Hawaii coastal sand dunes were often selected for habitation or for human burials.

RECOMMENDATIONS

Based on the findings of the surface and subsurface survey, it is recommended that archaeological monitoring be conducted if the dune formation at the western end of the property is to be excavated or in any way modified during development. No buried features or deposits were located in the dune; however, isolated features could be present between the coring locales.

It is also recommended that if the secondary deposit of structural debris is moved, limited monitoring take place at the onset, in order to determine if there are any intact wall sections or other intact structural remains at the base of the deposit.

It should be noted that the evaluations and recommendations presented in this final report have been based on a 100% surface and limited subsurface inventory survey of the project area, and are thus subject to the limitations of such surveys. There is always the possibility, however remote, that potentially significant, unidentified subsurface cultural features will be encountered in the course of future archaeological investigations or subsequent development. In such situations, archaeological consultation should be sought immediately.

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APPENDIX

HISTORICAL DOCUMENTARY RESEARCH

by Lehua Kalima, B.A.

The proposed site (D) for the Kihei Public Library is within the ahupua'a, of Kama'ole, in the Wailuku District of Maui. Ahupua'a boundaries are said to have been fixed about "twenty generations back in Hawaiian tradition" and remain largely unchanged (Yoklavich 1989:2). The larger land divisions, the districts, were fixed at the same time and were made up of a number of ahupua'a. With the establishment of new governmental forms in the mid-nineteenth century, the names and boundaries of the districts have been less stable than those of the ahupua'a. Until 1859, the district name for the western side of East Maui was Honua'ula (Red Earth) (ibid.). From 1859 until 1909 this section of land was included in the Wailuku District "for taxation, educational and judicial purposes" (ibid.). In 1909 more changes were made in the district boundaries by the legislature "for the election, taxation, educational, judicial, city, county, and all other purposes" (ibid.). A wide strip of land running from the west coast to the East Maui shore was named the Makawao district. Minor adjustments have been made to this district since its development, and Kama'ole Ahupua'a has again been put into the Wailuku District.

The project area is adjacent to the present Kalama Beach Park, near the coast, along the border of Keokea and Kama'ole. Few references to the ahupua'a of Kama'ole could be found, so to present a more general account of the area, the Makawao district (sometimes referred to as Kula) will also be discussed in this report.

Kama'ole literally means "childless," and Makawao means "watchful eyes of Wa-o = timeless or eternity" (Puku'i et al. 1974). Most Kama'ole references mention the general area of Makawao district and Kula (kula-o-ka-ma'o-ma'o or Land of Mirages, where lost souls wandered until they could find their way to rest [Ashdown n.d]). In her notes on Maui, Sterling (n.d.) says that "Makawao includes the ancient districts of Hamakualoa and Hamakuapoko and Honuaua. The last was transferred to Wailuku district where it never geologically belonged".

SAYINGS AND LEGENDS

Several old oral traditions concerning the Makawao area have survived to the present, including the following:

O 'Alelele ke kawa kaulana o Makawao.

'Alelele, the famous diving pool of Makawao. Refers to Makawao, Maui (Puku'i 1983:2355).

E hu'e mai 'oe i ke koai'e o Makawao!

Try uprooting the koai'e tree of Makawao!
I defy you to tackle a lad of Makawao! A boast from a native of Makawao, Maui (ibid:298).

Ka ua 'Ukiu o Makawao.

The 'Ukiu rain of Makawao.
Refers to Makawao, Maui (ibid:1602).

The rain of Makawao was described by Mrs. Miverva Kalama to E. Sterling in this way: "ukiurain - a soft drizzle (the ua kama'aina [familiar rain] of Makawao) when the kiu rain cloud from Makawao meets the nalu rain cloud from Kula then the rain comes, the typical Makawao rain" (Sterling n.d.).

A passage in Edward G. Beckwith's Journal of a Tour on Maui, also speaks of the unusual rain in Makawao:

We noticed a peculiar meteorological phenomena through the whole ride. The trade wind which blows from the ocean across the Northwestern slope of Haleakala, is highly charged with vapor, which is condensed by the cool mountain air, and falls in abundant rains over the region of Makawao. Along the west side of the mountains about half way to the summit, lay a long line of cumulo stratus clouds, and between this and the nimbus there was but little space. The former lay along side of the mountain, apparently immovable, while the latter would advance and recede, now coming very near and coquettishly scattering its shining rain-drops beneath the very head of immovable cumulus, and now retreating as though afraid of its more dignified companion. While mentioning this latter peculiarity to a gentleman this evening, he remarked that it was this feature of the clouds

which gave the place its name - Makawao, Mako = to be afraid, wao = a cloud (IN Sterling n.d.).

Sterling notes that this is incorrect. Afraid is maka'u and cloud is ao. Mrs. Pukui says Makawao is the "kuahiwi - a mountain region. wao = a general term for inland region, usually not precipitous and often uninhabited."

One old saying was found that related specifically to Kama'ole:

'Ajuka ka 'ina i kai o Kama'ole.

Thick with sea urchins in the sea of Kama'ole. Applied to a person laden with somebody else's work. A chief was once traveling along the beach at Kama'ole, Kula, Maui. A woman, not recognizing him as a chief, asked him to carry her bundle of sea urchins, which he did. Other women came along and did likewise until the chief was loaded with them (Puku'i 1983:114).

Other legends refer to Kama'ole as a battle place. Samuel Kamakau, a 19th century native historian, gives this account:

Kauhi was a son of Kekaulike and a good soldier. He had led the attack in the wars carried on by Kekaulike, and was the commander-in-chief in the battles of his father's time. These were the battles of Ki'imaumuku and Kipuka'ohelo at Kama'ole, and of Kaeulu and Kahalemamalekoa at Kaupo, by which he established peace for his father as ruling chief of Maui...(Kamakau 1961:73).

Another tale, concerning the greed of a chief in this area, is related by Kamakau and Abraham Fornander:

While Kahekili was carrying on the war on Oahu and suppressing the revolt of the Oahu chiefs, [Kamakau dates this 1785] a serious disturbance on Maui had occurred which gave him much uneasiness. It appears that he had given the charge of his herds of hogs that were running in the Kula district and on the slopes of Haleakala to a petty chief named Kukeawe. This gentleman, not satisfied with whatever he could embezzle

from his master's herds, made raids upon the farmers and country people of Kula, Honuaula, Kahikinui, and even as far as Kaupo, robbing them of their hogs, under pretext that they belonged to Kahekili. Indignant at this tyranny and oppression, the country people rose in arms and a civil war commenced. Kukeawe called the military forces left by Kahekili at Wailuku to his assistance; a series of battles were fought, and finally Kukeawe was killed at Kamaole-i-kai, near Palauea, and the revolted farmers remained masters of the situation (Fornander 1969:228).

This uprising of the country people was called the "Battle of the pig-eating Ku-keawe" ('Aipua'a-a-Ku-keawe) (Kamakau 1961:142).

HEIAU

T.G. Thrum lists four heiau said to have existed within Kama'ole Ahupua'a. Of the four mentioned, however, he himself had only seen the remains of one, Wailuku Heiau:

The heiau known as Wailuku, in Kamaole, Kula (Formerly reported) was visited and found to be of the platform type, some 40 x 60 feet in size, in ruins. Its upper end showed a low terraced wall, while the lower wall must have been ten feet high in its day. This heiau is held to be of the severe or pookanaka class, and is much revered from the alleged frequency of drum and other sounds emanating therefrom on the nights of Kane (Thrum 1921:146).

Of the other three he briefly writes:

Wailuku heiau, in ili of Kawililipoa, Kamaole, mauka. not seen.

Kolea heiau, in ili of Kawililipoa, for sacrifice, not seen.

Heiau, name unknown, in same ili, on sea plain, 200 feet makai or west of lower road and same distance south of Mormon church. Destroyed probably a kahua (Thrum 1918:128).

TRADITIONAL AGRICULTURE

Handy describes traditional agriculture in the Kula area of Maui:

Kula was always an arid region throughout its long low seashore, vast stony kula lands, and broad uplands. On the coast, where fishing was good, and on the lower westward slopes of Haleakala, a considerable population existed, fishing and raising occasional crops of potatoes along the coast, and cultivating large crops of potatoes inland, especially in the central and northeastern section...where rainfall drawn round the northwest slopes of Haleakala increases toward Makawao. Few Hawaiians, except cowboys, live in Kula now, and, so far as I observed, no sweet potatoes are planted (Handy 1940:161)

In their discussion of Hawaiian sweet potato planting techniques, Handy and Handy (1972:131) mention the kula area as a place:

Where potatoes are planted in crumbling lava combined with humus, as on eastern Maui and in Kona, Hawaii, the soil is softened and heaped carelessly in little pockets and patches utilizing favorable spots on slopes.

In an "Account of planting on Hawaii" from the Hawaiian Newspaper Ka Nupepa Ku'oko'a, March 24, 1922, Handy and Handy wrote:

Rocky lands in the olden days were walled up all around with the big and small stones of the patch until there was a wall (kuaiwi) about 2' high.

Kuykendall (1968:313) described the transition from traditional subsistence agriculture to the production of cash crops:

...Before that time the whalers had created a limited market for fresh vegetables, fresh meat, and fruit; the great increase in the number of whaleships after 1840 caused a corresponding increase in the demand for such products of the soil. In bulk and value, potatoes (sweet and Irish) ranked first in this traffic. In the early days only sweet potatoes

had been obtainable at the islands, but after 1830, if not sooner, cultivation of the Irish potato was taken up and during the 1840s and 1850s became of great importance. It was shortly before 1840 that Irish potatoes were first raised in the Kula district, which proved to be so well adapted to them that it soon came to be called the "potato district." Jarves describes the region as it appeared to him in July 1846:

It ranges along the mountain (Haleakala) between 2000 and 5000 feet elevation, for the distance of 12 miles. The forest is but partially cleared, and the seed put into the rich virgin soil. The crop now in the ground is immense. The fields being all in blossom have a fine appearance, spreading as they do, over the broad surface of the mountain.

From this upland region the potatoes were carried down to the shore and taken to Lahaina or were sold directly to ships which called at Kalepolepo. In the spring of 1847 it was estimated that the crop would amount to 20,000 barrels...In 1854, G.D. Gilman estimated that the local Hawaiian market, including whaleships, could be depended on to consume about 20,000 barrels of Irish potatoes.

LAND TENURE

Although there were many small parcels granted during the Mahele, The indices to Land Commision Awards states that Kama'ole was Government Land from the beginning. The numerous parcels may be a result of an experiment conducted by the administration of Kamehameha III prior to the Mahele of 1848. Kuykendall (1968:282) recounts this experiment with fee ownership and the reasons for it:

It will be remembered that the year 1845, during which the new land law was being written and in part enacted, was disturbed by an anti-foreign agitation, accompanied by a rather pointed suggestion that lands be given or sold to the common people, and that the legislative committee, in its reply to the petitions of the people, approved the idea of selling land to Hawaiian subjects. This was directly in line with the suggestions contained

in Dr. Judd's report as minister of the interior, and there were frequent allusions to the subject in the proceedings of the legislature. The agitation among the people probably hastened the decision of the government to make an experimental beginning without waiting for the new law to go into operation. The places selected for the experiment were the Makawao district of Maui and Manoa valley on Oahu.

During the King's tour of Maui in December, 1845, and January 1846, the party visited Makawao and it was announced that the entire district, with the exception of McLane's plantation, was to be offered for sale to the people in fee simple. Rev. J.S. Green, pastor of the Hawaiian church at Makawao, undertook to manage the business of selling the land. In afterwards relating his experience in connection with the project, Green said he called the people together, showed them his instructions from the government, and explained the plan to them.

A few of them purchased at once, others had less confidence that lands thus purchased would be secure, but soon abandoned their scruples, while others still could not for a long time, be persuaded that there was not some catch about it - some design to enrich the chiefs at their expense. But nearly all of these were finally talked out of their suspicions and took up each a small piece of land (letter in Polynesian, July 14, 1849).

Another missionary, Rev. Richard Armstrong, assisted the enterprise by making surveys. The land was sold at one dollar per acre, and nearly a hundred parcels were taken up, most of them ranging from 5 to 10 acres. Altogether about nine hundred acres were purchased by the people of the district.

Various notes for Kama'ole Ahupua'a are contained the Land File Index at the State Archives:

KAMAOLE AND KEOKEA

Ex. 1916 Oct. 24.
Commissioner of Public Lands to
Governor

Submitting Land Patent No.1 6706 to Frank Sommerfield and Patrick Cockett, in the above place, Kula Maui, given in exchange for certain lands to be used for roadway & right of way, for the kula pipe line, for approval.

Privy Council, Ahp. of Kamaole

Res. confirming the sale of the above Ahupuaa to several persons as per list. vol. 7, p. 231

Res. refusing the appl. of Henry Dimond and Edwin O. Hall for the above land.

Res. Instructing the Min. of Int. to engage Wm. P. Alexander to survey the above land and such other govt. lands in Kula.

Res. refusing James Humphries appl. for the above land.

Res. refusing to grant any portion of the above land to Naunau, Naukana and Makuauleo as the land has been reserved for the use of the Govt. cattle.

Res. Manu's Appl. for the purchase of 30 acres of Gov't. land of the above. Res. that the applicant be and is hereby directed to bargain with Wm. P. Alexander Govt. Agent for the sale of said land.

Int. Dept. 1870, Mar. 31

In report from the Gov. of Maui (Nahaolelua) for the quarter ending this date, showing that \$77.50 had been rec'd from the Govt. lands rented to John Ross at the above place &c.

Ex. (C.P.L.) 1920, June 4
Commissioner of Public Lands to
Governor

Submitting for approval transfer from Angus McPhee to C.C. Conratt of Kiawe Bean License effecting Gov't land at the above tract, Kula, Maui &c.

Int. Dept. Doc. no. 311

In list of royal patents and land claims, showing that Royal Patent no. 420 issued to Kanakaole and Royal Patent No. 472 issued to Kamao for lands in the above Place, are still in the archives of the Probate Court of Maui.

Int. Dept. Doc. no 355

List showing amounts paid by the following persons for lands in the above tract, Maui, &c.

Ahulau..\$11.50	Ieremia..\$15.50
Iae..\$207.	Ii..\$48.
Opunui..\$28.	L.S. Ma..\$66.
Hakolo..\$15.50	Harry..\$36.
Hilaa..\$110.	Holani..\$51.
James Humphries..\$691.	Kaalauka..\$148.
Kaili..\$6	Kaui..\$47.
Joane Marie (Kau)..\$26.	Kauiaka..\$97.
Kaumea..\$166.50	Kaheiaunui..\$15.50
Kahoopii..\$15.	Kalauao..\$201.
Kaluhala..\$46	Kalama..\$64.
Kalamaona..\$15.50...	

A total of 63 more individuals were listed, among whom were Kuihelani who payed \$442; David Malo who payed \$143.75; and the biggest spender, John Richardson who payed \$1,084.00. John Sniffin bought two lots, one for \$267.50 and \$192.00. The Swinton family bought five lots, which went to various family members, Jane, Martha, Harrietta, Helen and Henry.

Later cards (from 1861 on) show that J. Richardson and P. Nahaolelua (Governor of Maui) had received payment for parcels of land.

In all the Kama'ole Land File Index contains over 100 cards, evidence of the many changes that took place in ownership.

In September, 1977 Ross Cordy conducted a flood control study of seven ahupua'a in the Kihei area, including Kama'ole. Figure A-1 is taken from Cordy's report, and various archaeological sites are indicated. Site 1715 is nearest the prosed project area. This site consisted of three C-shape structures mauka of the project area. None of the 12 sites identified by Cordy in Kama'ole Ahupua'a were in the

coastal zone. He classified eight of these sites as historic and four as prehistoric. Of the eight historic sites, three of them (1718, 1719, 1721) functioned as cart/vehicle paths; one (1716) as a foot/horse path; one (1720) as an aqueduct; one (1717) ranch related; and two (1713 and 1714) as unknown. Of the four pre-historic sites he listed, three of them functioned as temporary housing sites (1715, 1723, 1724) and one (1722) was classified as unknown.

Cordy also compiled a data sample of Mahele testimony in order to provide information on the type of settlement within the inland and coastal zones of the seven ahupua'a he studied. The notes for Kama'ole Ahupua'a are listed in Table 1.

KALAMA BEACH PARK

The proposed project site is north of and adjacent to Kalama Beach Park. The following is a brief history of the park contained in Beaches of Maui County, by John Clark:

Kalama Beach Park was named in honor of Samuel E. Kalama, the Maui County Chariman and executive officer for the twenty year period from 1913 to 1933. Born Sept. 1, 1869, Kalama began his public career in 1888 when he was named clerk and tax accessor of the Makawao District. In 1893 he was appointed captain of the Makawao Police and also clerk of the road board. In 1899 he began a three-year term as deputy sheriff of the Makawao district. Kalama was elected as a Maui representative to the territorial legislature in 1902, and then again as senator, serving from 1904 to 1912. In 1912 he was successful in his bid for the chairmanship of the Maui Board of Supervisors, the equivalent of being mayor of Maui County. Kalama took over the position in 1913 and held it until the day of his death, on February 27, 1933. The park was officially dedicated with a public ceremony in May 1953.

Kalama Beach Park covers over thirty-six acres and contains a multitude of facilities, including twelve pavilions, three restrooms and showers, picnic tables, barbecue grills, playground equipment, one soccer field, one baseball field, tennis courts, a volleyball/basketball court, a caretaker's

Table 1.

MAHELE TESTIMONY		
	Inland	Coastal
LCA & Awardee		
8881..Kalauwao	Moku mau'u irish potato patches kula land in 'ili Kaukeakea	Houselot (at Kaluiahakoko, 'ili Kaukeakea
10890..Naihe	Kula land, pasture taro, Irish potato plots	Houselot ('ili Kaluiahakoko "which I occupy permanently")
10891..Holani	Pasture 'ili (Pahalona) taro, some Irish potato Houselot ('ili Pahalona)	Houselot (Kaukeakea 'ili, wife belonged to Kaluiahakoko & he worked lands there)
6445..Kamoa	Moku mau'u Irish potatoes in the barren zone, pasture	2 small houses
6471..Kaill	Moku mau'u, irish potato patches	Houselot
8038..Ahulau	claim - 'ili Paie (extends from sea mountain); sweet potato patches, pasture 'ili	Houselot in unknown location

(Cordy 1977:70-71).

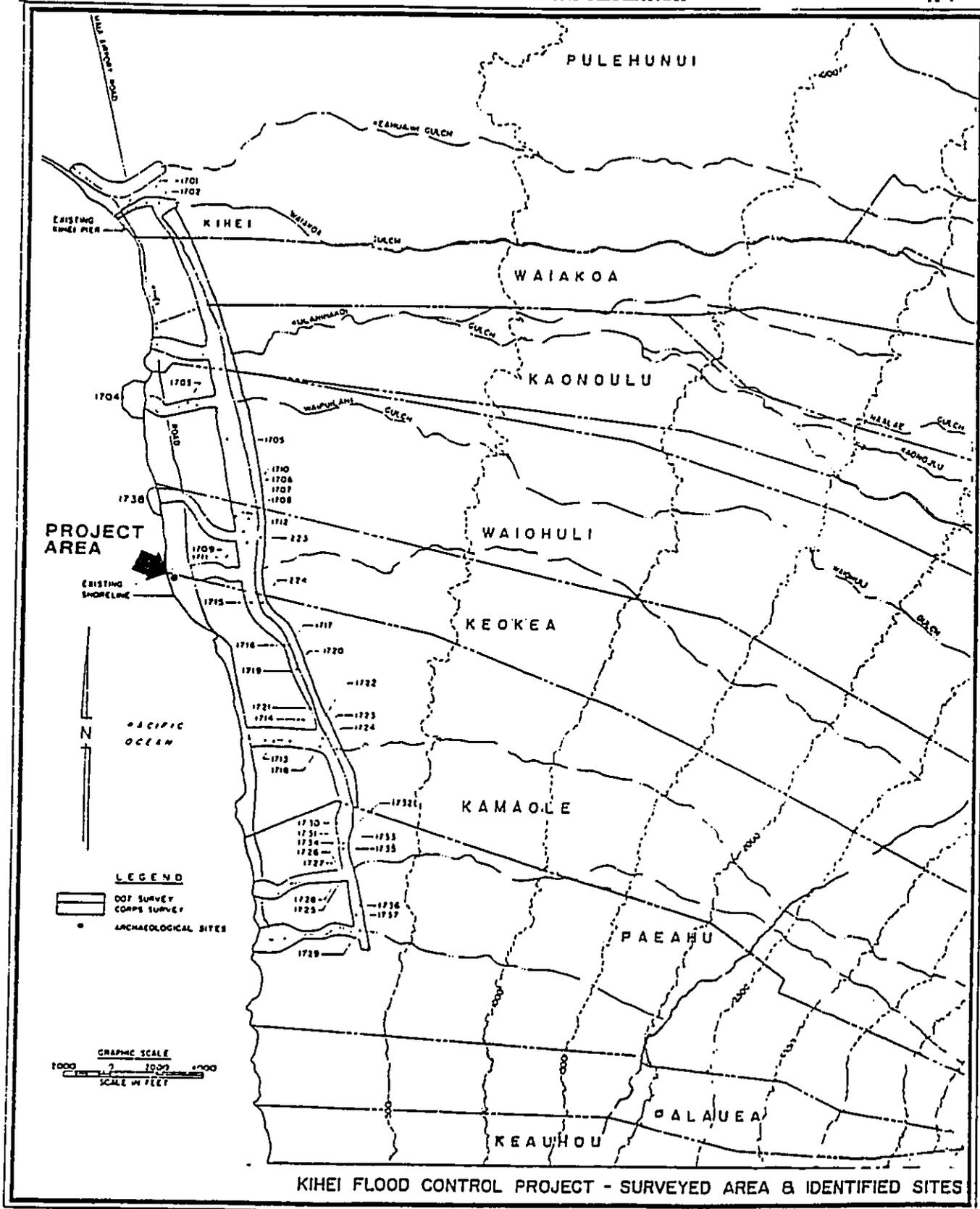


Figure 1-A. Map of Kihei Area with Site Locations
Taken from Ross H. Cordy 1977

residence, and a paved parking lot...

The building of the revetment fronting Kalama Beach Park created a great deal of controversy. Opponents of the project claimed the wall would permanently obliterate the beach, obstruct access to the water from the park, and create a "child trap" because the huge boulders have openings between them to allow drainage through the wall. Proponents, however, cited the fact that although the beach experiences seasonal erosion and accretion, the net effect has been erosion. Surveys made in 1912 and in 1961 showed that the shoreline had receded three hundred feet during this forty-nine year period. The erosion impaired the recreational use of the park and threatened the highway embankment at the south end of the beach. In the early 1970's an erosion control project was completed which included construction of a revetment along the threatened highway, construction of a twenty-five foot berm along the makai length of the park, and construction

of a three thousand foot long revetment seaward of the berm. The sloped revetment was designed to protect the berm from erosion and to encourage accretion of sand on the seaward side.

The south end of Kalama Beach Park is the site of the former Kihei Boat Ramp. It was officially closed on July 1, 1983, and replaced by the present ramp... A popular surfing site is located directly offshore the old ramp.

To the north of Kalama Beach Park is a fairly long white sand and coral rubble beach that fronts several residential communities. ...Two sections of this beach are known as Waimahaihai and Kawililipoa (Clark 1989:46).

The project area is next to a recreational facility, and near Kihei School. No significant archaeological sites were found near the project area, and historical evidence does not indicate that any significant sites are likely to be present.

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Appendix C

Traffic Impact Report

**DRAFT TRAFFIC IMPACT REPORT
FOR THE PROPOSED
KIHEI PUBLIC LIBRARY**

**PREPARED FOR
GIMA YOSHIMORI MIYABARA DEGUCHI
ARCHITECTS, INC.**

**Prepared By
Austin, Tsutsumi & Associates, Inc.
Engineers • Surveyors
Honolulu • Hilo • Wailuku, Hawaii**

DRAFT TRAFFIC IMPACT REPORT
FOR THE PROPOSED
KIHEI PUBLIC LIBRARY
TMK: 3-9-12:13

PREPARED FOR
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December 1992

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DRAFT TRAFFIC IMPACT REPORT

FOR THE PROPOSED

KIHEI PUBLIC LIBRARY

TMK: 3-9-12:13

I. INTRODUCTION

A. Purpose of Study

The State of Hawaii proposes to construct a new library on Waimahaihai Street, west (makai) of the County fire station, in Kihei, Maui, Hawaii. The purpose of this study is to analyze the traffic impacts resulting from the proposed Kihei Public Library. This report presents the findings and recommendations of the study.

B. Scope of Study

The scope of the study includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity of the project.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Development of trip generation characteristics for the proposed project.
5. Superimposing the site-generated traffic over future traffic conditions.

6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the development of the proposed project.

II. PROJECT DESCRIPTION

A. Location

The project site is located on Waimahaihai Street in Kihei, Maui and is identified as Tax Map Key: 3-9-12:13. The site is bounded by the County fire station on the east (mauka) side, Kalama Beach Park to the south, Waimahaihai Street to the north, and residential lots on the makai side. Access to the new library would be off Waimahaihai Street. The project vicinity map is shown on Exhibit 1.

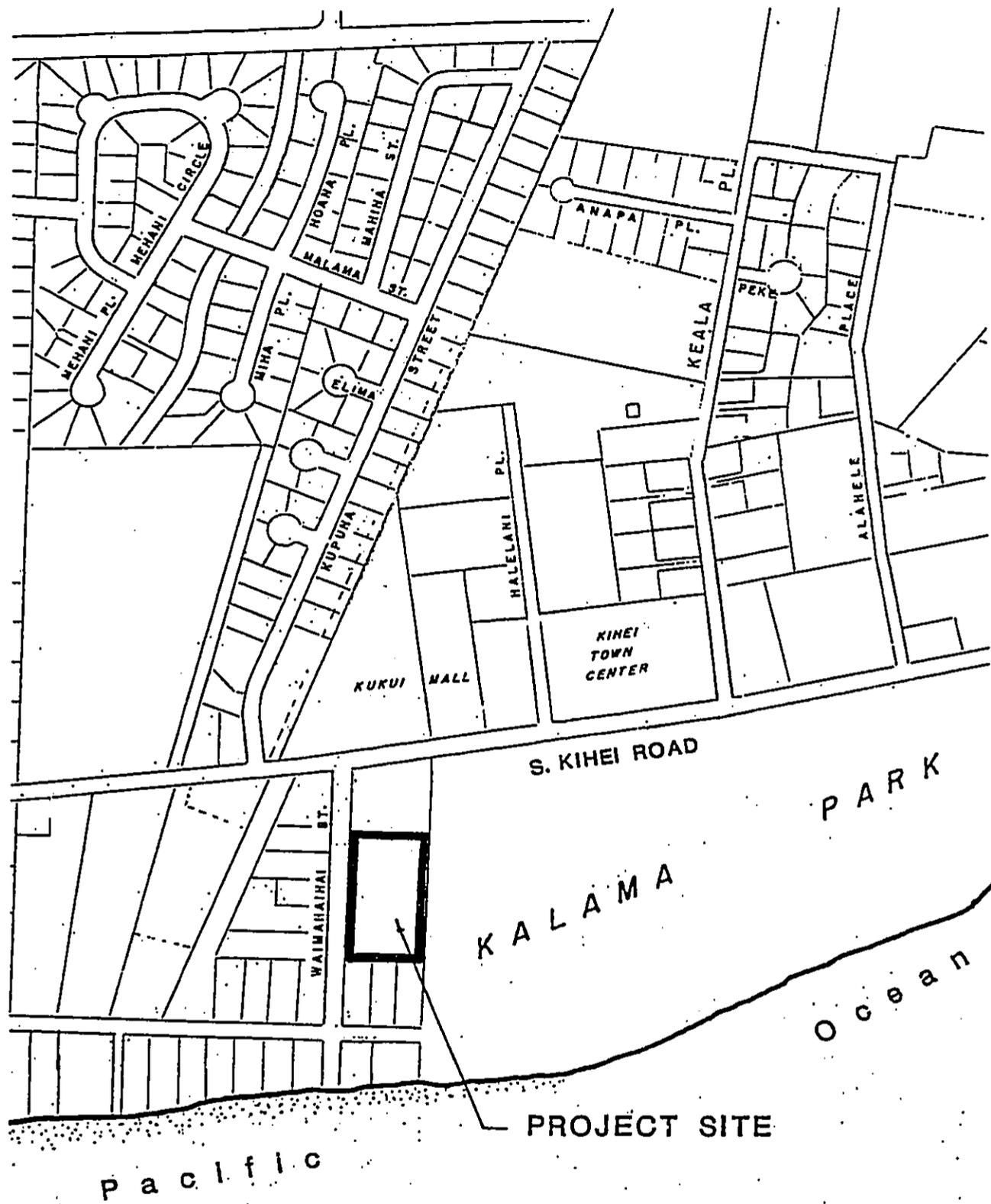
B. Project Characteristics

The proposed library would be situated on a 1.93-acre parcel of land. The proposed project would consist of a total of 18,751 square feet (SF) of gross floor area (GFA), and a 77-stall parking lot. This study assumes that the target year of completion for the new library is 1995. Exhibit 2 shows the proposed project site plan.

III. EXISTING TRAFFIC CONDITIONS

A. Area 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.



 AUSTIN, TSUTSUMI & ASSOCIATES, INC. ENGINEERS, SURVEYORS • HONOLULU, HAWAII	TRAFFIC IMPACT REPORT KIHAI PUBLIC LIBRARY VICINITY MAP	EXHIBIT 1
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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. South Kihei Road intersects Waimahaihai Street as an unsignalized, four-legged intersection. The mauka leg of this intersection is one of the access driveways to Kukui Mall. The other access driveways to Kukui Mall are located south of the intersection. The primary access to the proposed library would be through the intersection of South Kihei Road and Waimahaihai Street. 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 Wailea Resort. The State Department of Transportation (DOT) is planning to extend the highway further south, along the mauka boundary of the Wailea Development. The posted speed limit in Piilani Highway varies between 45 and 55 mph.

Waimahaihai Street is a two-lane, two-way local roadway that is oriented in the mauka-makai direction and is located makai of South Kihei Road. Waimahaihai Street connects South Kihei Road with Halama Street, a local roadway serving the residential lots along the shoreline. Waimahaihai Street has a pavement width of 18 feet fronting the proposed project.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

The field investigation was conducted on November 12, 1992. It consisted of the following: a site inspection of the road

and traffic conditions in the vicinity; a manual turning movement traffic count survey; and a mechanical traffic count on South Kihei Road just north of Waimahaihai Street. The manual traffic count survey was conducted between the mid-day hours of 11:00 AM and 1:00 PM, and between the afternoon hours of 2:30 PM and 5:30 PM at the intersection of South Kihei Road and Waimahaihai Street. A typical library generates peak vehicular traffic between these hours. Therefore, the analysis in this study is focused on the mid-day and PM peak hours.

b. Capacity Analysis Methodology

The highway capacity analysis performed for this study is based upon procedures presented in the "Highway Capacity Manual", Special Report 209, Transportation Research Board, 1985, and the "Highway Capacity Software", developed by the Federal Highway Administration.

Level of Service (LOS) is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F", LOS "A" representing an ideal operating condition and LOS "F" the worst operating condition. The Appendix includes the LOS definitions.

"Volume-to-capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at capacity. A v/c ratio of greater than 1.00 indicates that the projected traffic demand exceeds the road's carrying capacity.

2. Existing Peak Hour of Traffic

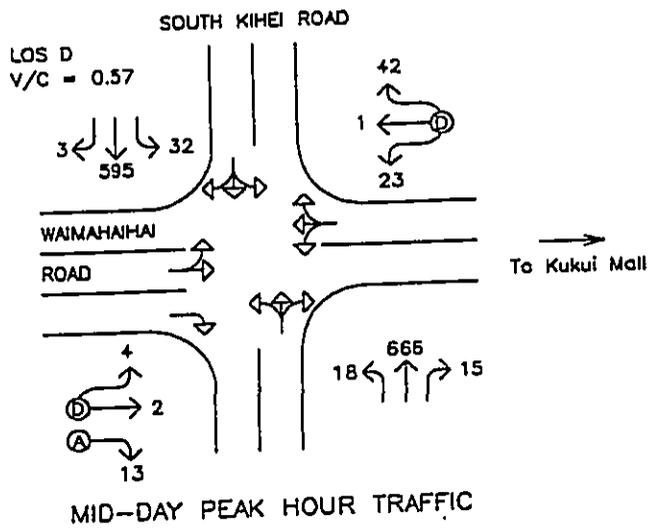
a. General

Exhibit 3 shows the existing mid-day and PM peak hour traffic volumes and operating traffic conditions. The mid-day peak hour of traffic generally occurs between 11:45 AM and 12:45 PM. The PM peak hour of traffic occurs between 4:30 PM and 5:30 PM.

South Kihei Road is heavily utilized throughout the day. Based on the State DOT traffic count data taken in the region, the traffic volumes show three distinct daily peaks. The peak traffic volumes occur during the AM peak hour commuter traffic (before 9:00 AM); the mid-day peak hour (near noon); and the PM peak hour commuter traffic (afternoon). For the purpose of this study, the analysis is focused on the mid-day and PM peak hours.

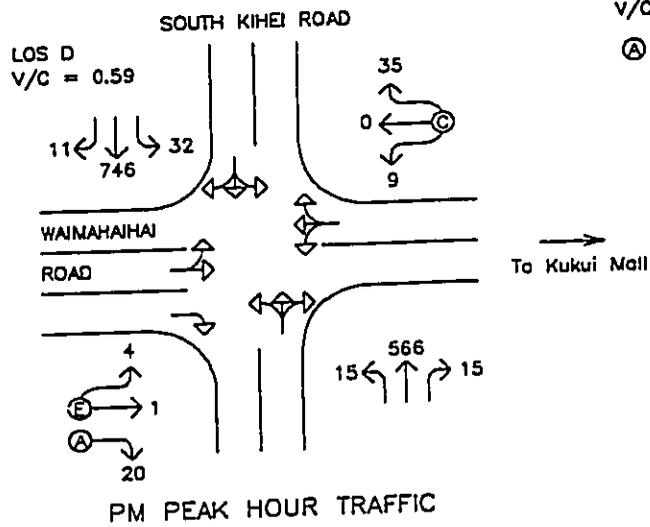
b. Mid-Day Peak Hour

During the mid-day peak hour of traffic, South Kihei Road, just north of Waimahaihai Street, carries 1,342 vehicles, 712 vehicles north bound and 630 vehicles south bound. The two-lane South Kihei Road would operate at LOS "D" and at a v/c ratio of 0.57. A portion of the higher north bound volume appears to be trips generated by the Wailea Resort Complex located south of the project. The findings of other traffic studies for individual developments in Wailea indicate that the resort-related trips generally occur during the late mornings. Much of the tourist-oriented shops and commercial activities are located on South Kihei Road. Therefore, one can reasonably assume



- LEGEND
- TRAFFIC MOVEMENT VOLUME (VPH)
 - LANE USAGE
 - LEVEL OF SERVICE (TWO-LANE HWY)
 - VOLUME-TO-CAPACITY RATIO
 - LEVEL OF SERVICE (UNSIGNALIZED INTERSECTION)

DATE OF COUNT: NOVEMBER 12, 1992



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	EXISTING PEAK HOUR TRAFFIC	3

that resort-related trips contribute to the heavy through traffic volumes on South Kihei Road.

A total of 1,414 vehicles entered the intersection of South Kihei Road and Waimahaihai Street during the mid-day peak hour, with approximately 95% of the total traffic on South Kihei Road. The heavy north-south through traffic volume at the intersection resulted in excessive delays for the movement of side street traffic. Much of the Waimahaihai Street and Kukui Mall traffic entering South Kihei Road experiences delays in the 30-second to 50-second range. During the mid-day peak hour of traffic, the left-turn movement from Waimahaihai Street to north bound South Kihei Road operates at LOS "D"; and the driveway exiting Kukui Mall also operates at LOS "D".

c. PM Peak Hour

During the PM peak hour of traffic, South Kihei Road, just north of Waimahaihai Street, carries 1,394 vehicles, 789 vehicles south bound and 605 vehicles north bound. South Kihei Road is heavily utilized during the PM peak hour and operates at LOS "D" and at a v/c ratio of 0.59. The directional split of traffic indicates that a greater number of vehicles is headed in the south bound direction. Similar to mid-day peak hour traffic operations, a portion of the south bound volume, during the PM peak hour, could be trips generated by the Wailea Resort Complex, located south of the study area, since much of the tourist attractions and commercial activities are located on South Kihei Road.

A total of 1,454 vehicles entered the intersection of South Kihei Road and Waimahaihai Street during the PM peak hour of traffic. Side street delays for vehicles entering South Kihei Road

from Waimahaihai Street and the Kukui Mall driveway were also measured in the 30- to 50-second range. The left-turn movement from Waimahaihai Street to north bound South Kihei Road operates at LOS "E" during the PM peak hour of traffic. The traffic movements exiting Kukui Mall at this intersection operate at LOS "C".

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

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. The ITE trip rates are developed empirically, by correlating the vehicle trip generation data with various land use characteristics, such as vehicle trips per gross floor area of development. Table 1 shows a summary of the vehicle trip generation.

TABLE 1. TRIP GENERATION SUMMARY

Kihei Public Library Building Area: 18,751 S.F. G.F.A. ITE Land Use Code: 590			ITE Trip Rate	Vehicle Trips
Average Weekday Vehicle Trip Ends			45.50	853
Peak Hour of Generator	Midday	Enter	1.52	29
		Exit	1.71	32
		Total	3.23	61
	PM	Enter	3.29	62
		Exit	2.91	54
		Total	6.20	116

2. Trip Generation Characteristics

The proposed Kihei Public Library is expected to generate 61 vehicles during the projected mid-day peak hour of traffic, 29 vehicles entering and 32 vehicles exiting. During the projected PM peak hour of traffic, the proposed library is expected to generate 116 vehicles, 62 vehicles entering and 54 vehicles exiting.

3. Traffic Assignment

The traffic generated by the proposed project is distributed and assigned to the roadways in the study area. The distribution of traffic is based upon existing traffic patterns. During the mid-day peak hour, 53% (17 vehicles) of the trips exiting the proposed project are expected to head north, and 47% (15 vehicles) are expected to head south. During the PM peak hour, 57% (31 vehicles) of the trips exiting the proposed project are expected to head south, and 43% (23 vehicles) are expected to head north. The vehicular traffic entering the proposed project during the mid-day and PM peak hours was distributed by the same percentages as the respective exiting traffic.

B. Through Traffic Forecasting Methodology

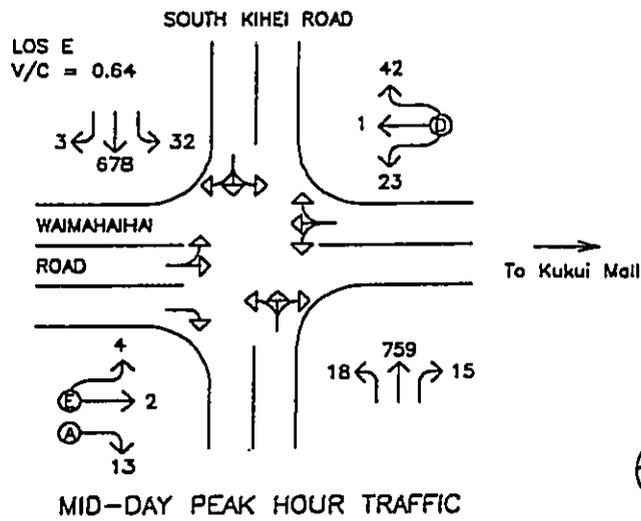
The travel forecast is based upon historical traffic count data, obtained from the DOT at survey stations on South Kihei Road at Waipuilani Road and at Auhuna Road. The range of data includes historical traffic volumes at the survey stations from the Year 1981 to the Year 1991, a ten-year sample. The historical data were analyzed by linear regression techniques to obtain an average annual growth rate of approximately 4.8% on South Kihei Road, using 1992 as the base year. A growth factor of 1.14 was applied to the existing through traffic demands on South Kihei Road to derive the Year 1995 traffic projections.

C. Total Traffic Volumes Without Project

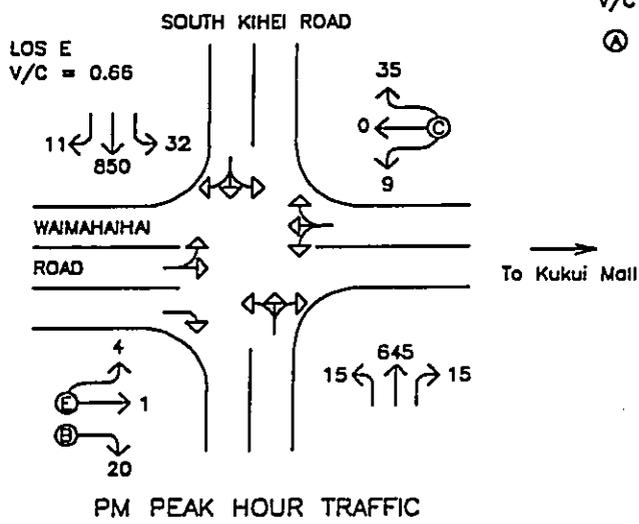
South Kihei Road, just north of Waimahaihai Street, is expected to operate at LOS "E" and at a v/c ratio of 0.64 during the mid-day peak hour of traffic. During the projected PM peak hour, South Kihei Road would operate at LOS "E" and at a v/c ratio of 0.66. South Kihei Road would continue to be heavily utilized throughout the day. Under the existing roadway network, the traffic operations on South Kihei Road would further deteriorate as the traffic volumes in the vicinity increase. Excessive side street delays would result with the increase of through traffic volumes on South Kihei Road. During the mid-day peak hour of traffic, the left-turn movement from Waimahaihai Street to north bound South Kihei Road would operate at LOS "E". The left-turn movement also would operate at LOS "E" during the projected PM peak hour. The west bound approach exiting Kukui Mall at this intersection would operate at LOS "D" during the mid-day peak hour. During the PM peak hour of traffic, the approach would operate at LOS "C". Exhibit 4 shows the projected 1995 mid-day and PM peak hour traffic volumes and operating traffic conditions without the proposed library.

D. Total Traffic Volumes With Project

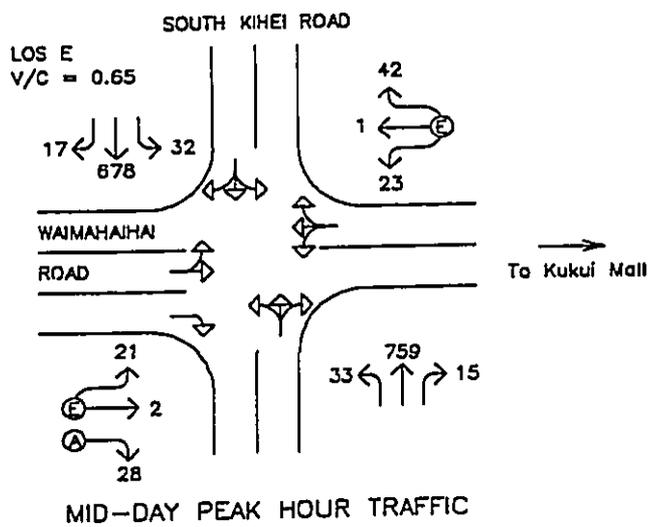
Exhibit 5 shows the cumulative mid-day and PM peak hour traffic volumes and operating traffic conditions with the proposed library. The cumulative volumes consist of site-generated traffic superimposed over 1995 projected traffic demands. The analysis is based upon the existing roadway network in the region. The intersection of South Kihei Road and Waimahaihai Street is also analyzed under existing geometric and unsignalized conditions. The traffic impacts resulting from the proposed project are addressed in the following section.



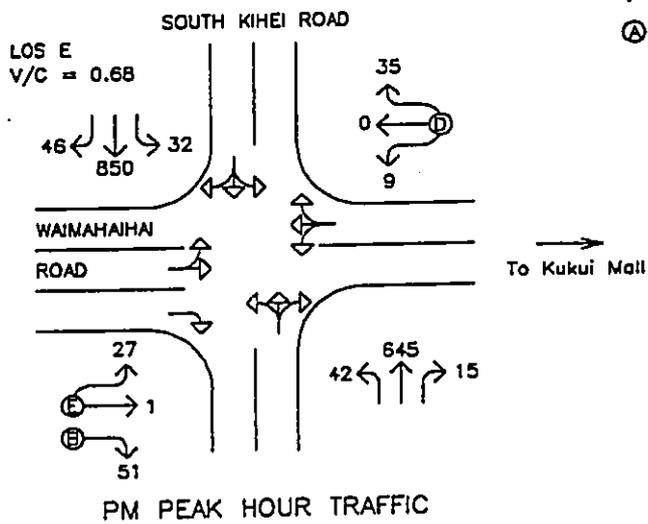
- LEGEND
- 90 TRAFFIC MOVEMENT VOLUME (VPH)
 - LANE USAGE
 - LOS LEVEL OF SERVICE (TWO-LANE HWY)
 - V/C VOLUME-TO-CAPACITY RATIO
 - LEVEL OF SERVICE (UNSIGNALIZED INTERSECTION)



ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC. ENGINEERS, SURVEYORS • HONOLULU, HAWAII	TRAFFIC IMPACT REPORT KIHEI PUBLIC LIBRARY 1995 PEAK HOUR TRAFFIC WITHOUT PROJECT	EXHIBIT <div style="font-size: 2em; font-weight: bold; margin: 10px 0;">4</div>
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- LEGEND**
- 90 TRAFFIC MOVEMENT VOLUME (VPH)
 - LANE USAGE
 - LOS LEVEL OF SERVICE (TWO-LANE HWY)
 - V/C VOLUME-TO-CAPACITY RATIO
 - LEVEL OF SERVICE (UNSIGNALIZED INTERSECTION)



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	CUMULATIVE PEAK HOUR TRAFFIC (WITH PROJECT)	5

V. TRAFFIC IMPACT ANALYSIS

A. Mid-Day Peak Hour of Traffic

South Kihei Road, just north of Waimahaihai Street, would carry a total of 1,549 vehicles during the mid-day peak hour of traffic, 822 vehicles north bound and 727 vehicles south bound. The increase in traffic over projected conditions without the proposed project would be 2%. South Kihei Road would continue to operate at LOS "E" and at a v/c ratio of 0.65. Side street delays are expected to increase as a result of historical trends, not by the addition of site-generated traffic on the street system. Traffic exiting the project site on Waimahaihai Street to north bound South Kihei Road would continue to experience LOS "E" conditions. The west bound approach from Kukui Mall at this intersection also would operate at LOS "E". The total number of vehicles entering the intersection would increase by approximately 4% over projected conditions without the proposed project.

B. PM Peak Hour of Traffic

During the PM peak hour, South Kihei Road, just north of Waimahaihai Street, would carry 1,635 vehicles, 707 vehicles north bound and 928 vehicles south bound. Traffic on South Kihei Road, in the project vicinity, would increase by 4% over projected traffic demands without the proposed project. The cumulative traffic volumes entering the intersection represent a 7% increase over projected traffic conditions without the proposed project. Similar to the cumulative mid-day peak hour, side street delays are a result of the increase in through traffic on South Kihei Road, not the addition of site-generated traffic. The left-turn movement from Waimahaihai Street to north bound South Kihei Road would continue to operate at LOS "E", while the west bound approach from Kukui Mall at this intersection operates at LOS "D".

VI. CONCLUSIONS

The proposed Kihei Public Library would not have a significant impact on traffic in the vicinity of the project. The vehicular traffic generated by the proposed project, during the mid-day and PM peak hours, are relatively low and near the suggested minimum of 100 vehicles per hour to warrant a traffic impact study as recommended by ITE. However, side street traffic on Waimahaihai Street, at the intersection with South Kihei Road, does experience LOS "E" operating conditions during the existing PM peak hour. The service quality of side street traffic at the unsignalized intersection is primarily influenced by through traffic demands on South Kihei Road.

Under the present roadway network, the increase in through traffic on South Kihei Road is expected to occur even without the development of the proposed library. The additional through traffic also would increase side street delays. To reduce through traffic demands on South Kihei Road would require diverting much of the through traffic to Piilani Highway, a north-south, high-quality arterial highway. From a regional perspective, this could be achieved by providing a system of sufficient mauka-makai collector/distributor roads between Piilani Highway and South Kihei Road. At this writing, there are several mauka-makai connecting roadways such as Ohukai Street, Lipoa Street and Keonekai Road, that are adequate for local traffic, but lack the carrying capacity to function as part of the collector/distributor system between the two arterials. Adequate intersection control, possibly traffic signalization or grade-separated interchanges at key intersections on Piilani Highway, also should be provided to move traffic efficiently on and off these arterials.

VII. RECOMMENDATIONS

1. The existing pavement of Waimahaihai Street, fronting the project site, provides two 9-foot lanes, one lane in each direction. The pavement should

be widened to provide two 11-foot lanes that would facilitate turning maneuvers in and out of the proposed access driveways.

2. The mauka bound approach of Waimahaihai Street, at the intersection with South Kihei Road, should be striped as two lanes; a shared left-turn/through lane, and an exclusive right-turn lane.
3. North bound and south bound left-turn lanes on South Kihei Road at Waimahaihai Street are recommended. The left-turn lanes on South Kihei Road should maintain through traffic flow on roadway.

APPENDICES

A P P E N D I X A

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

1. LEVELS OF SERVICE CRITERIA FOR TWO-LANE HIGHWAYS

The highest quality of traffic service occurs when motorists are able to drive at their desired speed, representative of Level of Service A. Almost no platoons of three or more vehicles are observed. Drivers would be delayed no more than 30 percent of the time by slow-moving vehicles. A maximum flow rate of 420 pcph, total in both directions, may be achieved under ideal conditions.

Level of Service B characterizes the region of traffic flow where drivers are delayed up to 45 percent of the time on the average. Service flow rates of 750 pcph, total in both directions, can be achieved under ideal conditions. Above this flow rate, the number of platoons forming in the traffic stream begins to increase dramatically.

Further increases in flow characterize Level of Service C, resulting in noticeable increases in platoon formation, platoon size, and frequency of passing impediment. At high volume levels, chaining of platoons and significant reductions in passing capacity begin to occur. While traffic flow is stable, it is becoming susceptible to congestion due to turning traffic and slow-moving vehicles. Percent time delays are up to 60 percent. A service flow rate of up to 1,200 pcph, total in both directions, can be accommodated under ideal conditions.

Unstable traffic flow is approached as traffic flows enter Level of Service D. The two opposing traffic streams essentially begin to operate separately at higher volume levels. Mean platoon sizes of 5 to 10 vehicles are common, although speeds of 50 mph can still be maintained under ideal conditions. The fraction of no passing zones along the roadway section usually has little influence on passing. Turning vehicles and/or roadside distractions cause major shockwaves in the traffic stream. The percentage of time motorists are delayed approaches 75 percent. Maximum service flow rates of 1,800 pcph, total in both directions, can be maintained under ideal conditions. This is the highest flow rate that can be maintained for any length of time over an extended section of level terrain without a high probability of breakdown.

Level of Service E is defined as traffic flow conditions on two-lane highways having a percent time delay of greater than 75 percent. Passing is virtually impossible under Level of Service E conditions, and platooning becomes intense when slower vehicles or other interruptions are encountered.



The highest volume attainable under Level of Service E defines the capacity of the highway. Under ideal conditions, capacity is 2,800 pcph, total in both directions. Operating conditions at capacity are unstable and difficult to predict. Traffic operations are seldom observed near capacity on rural highways, primarily because of a lack of demand.

As with other highway types, Level of Service F represents heavily congested flow with traffic demand exceeding capacity. Volumes are lower than capacity. Level of Service E is seldom attained over extended sections on level terrain as more than a transient condition; most often, perturbations in traffic flow as Level E is approached cause a rapid transition to Level of Service F.

2. LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service definitions for unsignalized intersections is determined by the reserve or unused capacity of a lane. The potential capacity is determined by the size and frequency in gaps in conflicting traffic that can accommodate the side street demand. The reserve capacity is equal to the potential capacity minus the traffic demand. A lower Level of Service translates into longer side street delay. The Levels of Service criteria are shown in the following table:

Table A-1. Level-of-Service Criteria
for Unsignalized Intersections

Reserve Capacity (PCPH)	Level of Service	Expected Delay to Minor Street Traffic
≥ 400	A	Little or no delay
300-399	B	Short traffic delays
200-299	C	Average traffic delays
100-199	D	Long traffic delays
0- 99	E	Very long traffic delays
< 0	F	Extreme traffic delays

A P P E N D I X B

EXISTING TRAFFIC COUNT DATA

SITE CODE : 00000001
 Location : S. KIHAI RD. N. OF WAIMAHAIHAI
 Weather : SUNNY, DRY PAV'T
 Operator : BSS

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PAGE: 1
 FILE: SOUNWAI

DATE: 11/12/92

TIME BEGIN	NORTHBOUND		SOUTHBOUND		COMBINED		DAY: THURSDAY
	AM	PM	AM	PM	AM	PM	
12:00	*	184	*	145	*	329	
12:15	*	178	*	159	*	337	
12:30	*	163	*	157	*	320	
12:45	*	162	687	*	132	593	294 1280
1:00	*	148	*	140	*	288	
1:15	*	136	*	135	*	271	
1:30	*	151	*	148	*	299	
1:45	*	168	603	*	120	543	288 1146
2:00	*	145	*	149	*	294	
2:15	*	144	*	192	*	336	
2:30	*	153	*	161	*	314	
2:45	*	135	577	*	159	661	294 1233
3:00	*	139	*	170	*	309	
3:15	*	131	*	150	*	281	
3:30	*	151	*	186	*	337	
3:45	*	147	568	*	171	677	318 1245
4:00	*	186	*	168	*	354	
4:15	*	153	*	167	*	320	
4:30	*	136	*	181	*	317	
4:45	*	136	611	*	187	703	323 1314
5:00	*	161	*	188	*	349	
5:15	*	158	*	196	*	354	
5:30	*	113	*	172	*	285	
5:45	*	0	432	*	0	556	0 988
6:00	*	*	*	*	*	*	
6:15	*	*	*	*	*	*	
6:30	*	*	*	*	*	*	
6:45	*	*	*	*	*	*	
7:00	*	*	*	*	*	*	
7:15	*	*	*	*	*	*	
7:30	*	*	*	*	*	*	
7:45	*	*	*	*	*	*	
8:00	*	*	*	*	*	*	
8:15	*	*	*	*	*	*	
8:30	*	*	*	*	*	*	
8:45	*	*	*	*	*	*	
9:00	*	*	*	*	*	*	
9:15	*	*	*	*	*	*	
9:30	*	*	*	*	*	*	
9:45	81	81	*	78	78	159	159
10:00	171	*	*	131	*	302	*
10:15	158	*	*	147	*	305	*
10:30	165	*	*	123	*	288	*
10:45	142	636	*	156	557	298	1193
11:00	174	*	*	136	*	310	*
11:15	146	*	*	161	*	307	*
11:30	150	*	*	151	*	301	*
11:45	138	608	*	152	600	290	1208
TOTALS	1325	3478	1235	3733	2560	7211	
DAY TOTALS		4803		4968		9771	
SPLIT %	51.8	48.2	48.2	51.8			
PEAK HOUR	10:15	12:00	10:45	4:30	10:45	4:30	
VOLUME	639	687	604	752	1216	1343	
P.H.F.	0.92	0.93	0.94	0.96	0.98	0.95	

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PAGE: 1
FILE: SONWAIM

SITE CODE : 1
Major St. : SOUTH KIHEI ROAD
Minor St. : WELAKAHAO STREET
Weather : SUNNY, DRY PAV'T

Primary Movements: Vehicles

DATE: 11/12/92

Time Begin	From West			From North			From East			From South			Vehicle Total
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
12:00 PM	2	1	4	5	129	6	4	0	16	12	158	3	340
12:15	2	4	2	9	141	8	5	0	6	10	122	1	310
12:30	4	3	1	0	133	17	3	5	15	13	120	1	315
12:45	5	3	2	2	125	22	4	2	18	13	171	2	369
HR TOTAL	13	11	9	16	528	53	16	7	55	48	571	7	1334
----- Break -----													
1:45	0	0	0	0	0	8	0	0	0	0	0	0	8
HR TOTAL	0	0	0	0	0	8	0	0	0	0	0	0	8
----- Break -----													
2:30	1	0	3	7	147	10	7	0	12	21	121	2	331
2:45	3	7	4	2	135	12	4	2	22	15	119	0	325
HR TOTAL	4	7	7	9	282	22	11	2	34	36	240	2	656
3:00 PM	5	5	1	4	150	24	5	0	13	13	125	3	348
3:15	3	9	0	2	141	19	5	0	15	18	121	1	334
DAY TOTAL	25	32	17	31	1101	126	37	9	117	115	1057	13	2680

PEAK PERIOD ANALYSIS FOR THE PERIOD: 12:00 PM - 3:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	..... VOLUMES .....				.... PERCENTS ...		
			Right	Thru	Left	Total	Right	Thru	Left
West	2:30 PM	0.73	12	21	8	41	29	51	20
North	2:30 PM	0.92	15	573	65	653	2	88	10
East	2:30 PM	0.76	21	2	62	85	25	2	73
South	12:00 PM	0.84	48	571	7	626	8	91	1
Entire Intersection									
West	2:30 PM	0.73	12	21	8	41	29	51	20
North		0.92	15	573	65	653	2	88	10
East		0.76	21	2	62	85	25	2	73
South		0.97	67	486	6	559	12	87	1

KIHEI LIBRARY

SITE CODE : 2
 Major St. : SOUTH KIHEI ROAD
 Minor St. : WAIMANAIHAI ROAD
 Weather : SUNNY, DRY PAV'T

PAGE: 1
 FILE: SOWWAPP

Primary Movements: Vehicles

DATE: 11/12/92

Time Begin	From West			From North			From East			From South			Vehicle Total
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
2:30	4	1	1	1	157	12	6	0	2	5	124	2	315
2:45	4	0	2	3	135	8	11	0	1	4	119	6	294
HR TOTAL	8	1	3	4	293	20	17	0	3	9	243	8	609
3:00 PM	2	0	3	3	161	8	8	1	5	0	134	0	325
3:15	6	0	0	2	160	4	9	0	1	4	132	9	327
3:30	4	0	3	4	167	5	3	1	2	5	158	4	355
3:45	4	0	2	2	140	8	11	0	3	2	141	3	316
HR TOTAL	16	0	8	11	628	25	31	2	11	11	565	16	1324
4:00 PM	12	0	3	1	184	5	5	0	3	1	159	5	378
4:15	0	0	0	1	166	8	3	0	3	2	140	4	327
4:30	6	1	1	1	175	7	7	0	4	5	129	6	342
4:45	2	0	2	4	192	7	12	0	1	2	139	3	364
HR TOTAL	20	1	6	7	717	27	27	0	11	10	567	18	1411
5:00 PM	3	0	0	3	189	9	7	0	2	4	141	3	361
5:15	9	0	1	3	190	9	9	0	2	4	157	3	387
DAY TOTAL	56	2	18	28	2017	90	91	2	29	38	1673	48	4092

PEAK PERIOD ANALYSIS FOR THE PERIOD: 2:30 PM - 5:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	..... VOLUMES .....				.... PERCENTS ...		
			Right	Thru	Left	Total	Right	Thru	Left
West	3:15 PM	0.57	26	0	8	34	76	0	24
North	4:30 PM	0.97	11	746	32	789	1	95	4
East	2:30 PM	0.79	34	1	9	44	77	2	20
South	3:30 PM	0.93	10	598	16	624	2	96	3

Entire Intersection *PAF = 0.94*

West	4:30 PM	0.63	20	1	4	25	80	4	16
North		0.97	11	746	32	789	1	95	4
East		0.85	35	0	9	44	80	0	20
South		0.91	15	566	15	596	3	95	3

KIHEI LIBRARY

SITE CODE : 1
 Major St. : SOUTH KIHEI ROAD
 Minor St. : WAIMAHAIHAI ROAD
 Weather : SUNNY, DRY PAV'T

PAGE: 1
 FILE: souvaia
 DATE: 11/12/92

Primary Movements: Vehicles

Time Begin	From West			From North			From East			From South			Vehicle Total
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
11:00 AM	5	0	0	1	155	5	5	0	4	2	148	2	327
11:15	7	0	0	2	162	6	8	0	1	1	140	3	330
11:30	3	1	2	1	123	5	10	0	4	4	127	2	282
11:45	3	0	1	0	144	7	15	0	4	4	146	6	330
HR TOTAL	18	1	3	4	584	23	38	0	13	11	561	13	1269
12:00 PM	4	1	0	1	154	12	11	0	7	2	188	6	365
12:15	1	1	1	2	151	10	7	0	7	5	177	3	365
12:30	5	0	2	0	146	3	9	1	5	4	155	3	333
12:45	6	0	2	1	119	8	9	0	0	0	151	4	300
HR TOTAL	16	2	5	4	570	33	36	1	19	11	671	16	1384

DAY TOTAL	34	3	8	8	1154	56	74	1	32	22	1232	29	2653
-----------	----	---	---	---	------	----	----	---	----	----	------	----	------

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:00 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	..... VOLUMES .....				.... PERCENTS ...		
			Right	Thru	Left	Total	Right	Thru	Left
West	12:00 PM	0.72	16	2	5	23	70	9	22
North	11:45 AM	0.94	3	595	32	630	0	94	5
East	11:45 AM	0.87	42	1	23	66	64	2	35
South	11:45 AM	0.89	15	666	18	699	2	95	3

Entire Intersection PHF = 0.02

West	11:45 AM	0.68	13	2	4	19	68	11	21
North		0.94	3	595	32	630	0	94	5
East		0.87	42	1	23	66	64	2	35
South		0.89	15	666	18	699	2	95	3

SITE CODE : 00000001
 Location : WAINAHAIHAI W. OF S. KIHEI RD.
 Weather : CLEAR, NOTE: COUNTER MALFUNCTION
 Operator : BSS

KIHEI PUBLIC LIBRARY

PAGE: 1
 FILE: WAINSOE
 DATE: 11/12/92

TIME BEGIN	Ch 1		Ch 2		COMBINED		DAY: THURSDAY
	AM	PM	AM	PM	AM	PM	
12:00	.	5	.	2	.	7	
12:15	.	.	.	.	.	.
12:30	.	.	.	.	.	.	7
12:45	.	5	.	2	.	.	
1:00	.	.	.	.	.	.
1:15	.	.	.	.	.	.
1:30	.	.	.	.	.	.	.
1:45	.	.	.	.	.	.	.
2:00	.	.	.	.	.	.	.
2:15	.	.	.	.	.	.	.
2:30	.	.	.	.	.	.	.
2:45	.	.	.	.	.	.	.
3:00	.	.	.	.	.	.	.
3:15	.	.	.	.	.	.	.
3:30	.	.	.	.	.	.	.
3:45	.	.	.	.	.	.	.
4:00	.	.	.	.	.	.	.
4:15	.	.	.	.	.	.	.
4:30	.	.	.	.	.	.	.
4:45	.	.	.	.	.	.	.
5:00	.	.	.	.	.	.	.
5:15	.	.	.	.	.	.	.
5:30	.	.	.	.	.	.	.
5:45	.	.	.	.	.	.	.
6:00	.	.	.	.	.	.	.
6:15	.	.	.	.	.	.	.
6:30	.	.	.	.	.	.	.
6:45	.	.	.	.	.	.	.
7:00	.	.	.	.	.	.	.
7:15	.	.	.	.	.	.	.
7:30	.	.	.	.	.	.	.
7:45	.	.	.	.	.	.	.
8:00	.	.	.	.	.	.	.
8:15	.	.	.	.	.	.	.
8:30	.	.	.	.	.	.	.
8:45	.	.	.	.	.	.	.
9:00	.	.	.	.	.	.	.
9:15	.	.	.	.	.	.	.
9:30	.	.	.	.	.	.	.
9:45	.	.	.	.	.	.	.
10:00	0	.	1	.	1	.	.
10:15	2	.	7	.	9	.	.
10:30	6	.	4	.	10	.	.
10:45	4	12	2	14	6	26	.
11:00	2	.	5	.	7	.	.
11:15	7	.	3	.	10	.	.
11:30	9	.	3	.	12	.	.
11:45	3	21	5	16	8	37	.
TOTALS	33	5	30	2	63	7	
DAY TOTALS		38		32		70	
SPLIT %	52.4	71.4	47.6	28.6			
PEAK HOUR	10:45	12:00	10:15	12:00	11:00	12:00	
VOLUME	22	5	18	2	37	7	
P.H.F.	0.61	0.25	0.64	0.25	0.77	0.25	

EQUIPMENT MALFUNCTION

A P P E N D I X C

CAPACITY ANALYSIS CALCULATIONS

**EXISTING PEAK HOUR
OF TRAFFIC**

1985 HCM:TWO-LANE HIGHWAYS

FACILITY LOCATION.... SOUTH KIHEI RD N. OF WAIMAHAIHAI ST
 ANALYST..... PGP
 TIME OF ANALYSIS..... 11:45-12:45 AM
 DATE OF ANALYSIS..... 11/12/92
 OTHER INFORMATION.... SOUNWAIA. EXISTING

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	2.29
PERCENTAGE OF BUSES.....	.36
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.94
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	47 / 53
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	6
PERCENT NO PASSING ZONES.....	0

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	2	1.8	2.2	.93	.98	.97
B	2.2	2	2.5	.93	.98	.97
C	2.2	2	2.5	.93	.98	.97
D	2	1.6	1.6	.93	.98	.98
E	2	1.6	1.6	.94	.98	.98

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 1342
 ACTUAL FLOW RATE: 1428

LOS	SERVICE FLOW RATE	V/C
A	374	.15
B	670	.27
C	1066	.43
D	1597	.64
E	2521	1

LOS FOR GIVEN CONDITIONS: D

1985 HCM: TWO-LANE HIGHWAYS

 FACILITY LOCATION.... SOUTH KIHAI RD N. OF WAIMAHAIHAI ST
 ANALYST..... PGP
 TIME OF ANALYSIS..... 4:30-5:30 PM
 DATE OF ANALYSIS..... 11/12/92
 OTHER INFORMATION.... SOUNWAIP. EXISTING

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	1.4
PERCENTAGE OF BUSES.....	.3
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.97
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	43 / 57
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	6
PERCENT NO PASSING ZONES.....	0

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	2	1.8	2.2	.93	.96	.98
B	2.2	2	2.5	.93	.96	.98
C	2.2	2	2.5	.93	.96	.98
D	2	1.6	1.6	.93	.96	.98
E	2	1.6	1.6	.94	.96	.98

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME (vph): 1394
 ACTUAL FLOW RATE: 1437

LOS	SERVICE FLOW RATE	V/C
A	368	.15
B	660	.27
C	1052	.43
D	1572	.64
E	2482	1

LOS FOR GIVEN CONDITIONS: D

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 30

PEAK HOUR FACTOR..... .92

AREA POPULATION..... 8000

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET

NAME OF THE NORTH/SOUTH STREET..... SOUTH KIHEI ROAD

NAME OF THE ANALYST..... PGP

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/16/92

TIME PERIOD ANALYZED..... 11:45-12:45 PM

OTHER INFORMATION.... SOUWAIA. EXISTING 11/12/92

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	4	23	18	32
THRU	2	1	666	595
RIGHT	13	42	15	3

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	1	1	1
LANE USAGE	LT + R	LTR		

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	30	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	2	0	1
SOUTHBOUND	3	0	1

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	5.50	5.50	0.00	5.50
WB	5.50	5.50	0.00	5.50
MAJOR LEFTS				
SB	5.00	5.00	0.00	5.00
NB	5.00	5.00	0.00	5.00
MINOR THROUGHGS				
EB	6.00	6.00	0.00	6.00
WB	6.00	6.00	0.00	6.00
MINOR LEFTS				
EB	6.50	6.50	0.00	6.50
WB	6.50	6.50	0.00	6.50

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
DATE AND TIME OF THE ANALYSIS..... 11/16/92 ; 11:45-12:45 PM
OTHER INFORMATION.... SOUWAIA. EXISTING 11/12/92

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M		SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET								
EB LEFT	4	112	98	>	109	98	>	102 94 >D E
THROUGH	2	146	138	>		138	>	136 > D
RIGHT	14	524	524			524		509 A
MINOR STREET								
WB LEFT	25	117	108	>		108	>	83 > E
THROUGH	1	148	139	>	213	139	>	141 138 >D D
RIGHT	46	469	469	>		469	>	424 > A
MAJOR STREET								
SB LEFT	35	539	539			539		504 A
NB LEFT	20	598	598			598		578 A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
 DATE AND TIME OF THE ANALYSIS..... 11/16/92 ; 11:45-12:45 PM
 OTHER INFORMATION.... SOUWAIA. EXISTING 11/12/92

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 30
 PEAK HOUR FACTOR..... .94
 AREA POPULATION..... 8000
 NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET..... SOUTH KIHEI ROAD
 NAME OF THE ANALYST..... PGP
 DATE OF THE ANALYSIS (mm/dd/yy)..... 11/16/92
 TIME PERIOD ANALYZED..... 4:30-5:30 PM
 OTHER INFORMATION.... SOUWAIP. EXISTING 11/12/92

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN
 CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	4	9	15	32
THRU	1	0	566	746
RIGHT	20	35	15	11

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	1	1	1
LANE USAGE	LT + R	LTR		

ADJUSTMENT FACTORS

Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	30	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	2	0	1
SOUTHBOUND	3	0	1

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	5.50	5.50	0.00	5.50
WB	5.50	5.50	0.00	5.50
MAJOR LEFTS				
SB	5.00	5.00	0.00	5.00
NB	5.00	5.00	0.00	5.00
MINOR THROUGHGS				
EB	6.00	6.00	0.00	6.00
WB	6.00	6.00	0.00	6.00
MINOR LEFTS				
EB	6.50	6.50	0.00	6.50
WB	6.50	6.50	0.00	6.50

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
 DATE AND TIME OF THE ANALYSIS..... 11/16/92 ; 4:30-5:30 PM
 OTHER INFORMATION.... SOUWAIP. EXISTING 11/12/92

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTEN-	ACTUAL	SHARED		RESERVE		LOS	
		TIAL CAPACITY c (pcph) P	MOVEMENT CAPACITY c (pcph) M	CAPACITY c (pcph) SH	CAPACITY c (pcph) SH	CAPACITY c = c - v R SH			
MINOR STREET									
EB LEFT	4	109	99	>	105	99	>	99	95 > E E
THROUGH	1	141	134	>		134	>		133 > D
RIGHT	21	425	425			425			404 A
MINOR STREET									
WB LEFT	10	112	102	>		102	>		93 > E
THROUGH	0	142	135	>	290	135	>	243	135 > C D
RIGHT	37	548	548	>		548	>		511 > A
MAJOR STREET									
SB LEFT	34	618	618			618			584 A
NB LEFT	16	497	497			497			481 A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
 DATE AND TIME OF THE ANALYSIS..... 11/16/92 ; 4:30-5:30 PM
 OTHER INFORMATION.... SOUWAIP. EXISTING 11/12/92

A P P E N D I X C

CAPACITY ANALYSIS CALCULATIONS

**YEAR 1995 PEAK HOUR
OF TRAFFIC WITHOUT PROJECT**

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 30
 PEAK HOUR FACTOR..... .92
 AREA POPULATION..... 8000
 NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET..... SOUTH KIHEI ROAD
 NAME OF THE ANALYST..... PGP
 DATE OF THE ANALYSIS (mm/dd/yy)..... PROJECTED
 TIME PERIOD ANALYZED..... MID-DAY PEAK HOUR
 OTHER INFORMATION.... SOUWAOA. 1995 WOP

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN
 CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	4	23	18	32
THRU	2	1	759	678
RIGHT	13	42	15	3

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	1	1	1
LANE USAGE	LT + R	LTR		

ADJUSTMENT FACTORS

Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	30	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	2	0	1
SOUTHBOUND	3	0	1

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	5.50	5.50	0.00	5.50
WB	5.50	5.50	0.00	5.50
MAJOR LEFTS				
SB	5.00	5.00	0.00	5.00
NB	5.00	5.00	0.00	5.00
MINOR THROUGH				
EB	6.00	6.00	0.00	6.00
WB	6.00	6.00	0.00	6.00
MINOR LEFTS				
EB	6.50	6.50	0.00	6.50
WB	6.50	6.50	0.00	6.50

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
 DATE AND TIME OF THE ANALYSIS..... PROJECTED ; MID-DAY PEAK HOUR
 OTHER INFORMATION.... SOUWAQA. 1995 WOP

CAPACITY AND LEVEL-OF-SERVICE

Page-3

MOVEMENT	FLOW-RATE v (pcph)	POTEN-	ACTUAL	SHARED		RESERVE		LOS	
		TIAL CAPACITY c (pcph) p	MOVEMENT CAPACITY c (pcph) M	CAPACITY c (pcph) SH	CAPACITY c (pcph) SH	c = c - v R SH			
MINOR STREET									
EB LEFT	4	95	82	>	89	82	>	83	78 > E E
THROUGH	2	115	108	>		108	>		105 > D D
RIGHT	14	465	465			465			451 A
MINOR STREET									
WB LEFT	25	95	86	>		86	>		61 > E E
THROUGH	1	115	108	>	174	108	>	103	106 > D D
RIGHT	46	409	409	>		409	>		364 > B
MAJOR STREET									
SB LEFT	35	478	478			478			443 A
NB LEFT	20	539	539			539			519 A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
DATE AND TIME OF THE ANALYSIS..... PROJECTED ; MID-DAY PEAK HOUR
OTHER INFORMATION.... SOUWAQA. 1995 WOP

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 30
 PEAK HOUR FACTOR..... .94
 AREA POPULATION..... 8000
 NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET..... SOUTH KIHEI ROAD
 NAME OF THE ANALYST..... PGP
 DATE OF THE ANALYSIS (mm/dd/yy)..... PROJECTED
 TIME PERIOD ANALYZED..... PM PEAK HOUR
 OTHER INFORMATION.... SOUWAOP. 1995 WOP

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN
 CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	4	9	15	32
THRU	1	0	645	850
RIGHT	20	35	15	11

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	1	1	1
LANE USAGE	LT + R	LTR		

ADJUSTMENT FACTORS

Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	30	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	2	0	1
SOUTHBOUND	3	0	1

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	5.50	5.50	0.00	5.50
WB	5.50	5.50	0.00	5.50
MAJOR LEFTS				
SB	5.00	5.00	0.00	5.00
NB	5.00	5.00	0.00	5.00
MINOR THROUGHGS				
EB	6.00	6.00	0.00	6.00
WB	6.00	6.00	0.00	6.00
MINOR LEPTS				
EB	6.50	6.50	0.00	6.50
WB	6.50	6.50	0.00	6.50

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
 DATE AND TIME OF THE ANALYSIS..... PROJECTED ; PM PEAK HOUR
 OTHER INFORMATION.... SOUWAOP. 1995 WOP

CAPACITY AND LEVEL-OF-SERVICE

Page-3

MOVEMENT	FLOW-RATE v (pcph)	POTEN-	ACTUAL	SHARED		RESERVE		LOS	
		TIAL CAPACITY c (pcph) P	MOVEMENT CAPACITY c (pcph) M	CAPACITY c (pcph) SH	CAPACITY c (pcph) SH	CAPACITY c = c - v R SH			
MINOR STREET									
EB LEFT	4	95	85	>	89	85	>	84	81 > E E
THROUGH	1	115	108	>		108	>		107 > D
RIGHT	21	373	373			373			351 B
MINOR STREET									
WB LEFT	10	95	86	>		86	>		76 > E
THROUGH	0	115	108	>	251	108	>	204	108 > C D
RIGHT	37	494	494	>		494	>		457 > A
MAJOR STREET									
SB LEFT	34	564	564			564			529 A
NB LEFT	16	439	439			439			423 A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
DATE AND TIME OF THE ANALYSIS..... PROJECTED ; PM PEAK HOUR
OTHER INFORMATION.... SOUWAØP. 1995 WOP

1985 HCM: TWO-LANE HIGHWAYS

FACILITY LOCATION.... SOUTH KIHEI RD N. OF WAIMAHAIHAI ST
 ANALYST..... PGP
 TIME OF ANALYSIS..... MID PEAK HOUR
 DATE OF ANALYSIS..... PROJECTED
 OTHER INFORMATION.... SOUNWAQA. 1995 WOP

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	2.29
PERCENTAGE OF BUSES.....	.36
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.94
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	47 / 53
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	6
PERCENT NO PASSING ZONES.....	0

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	2	1.8	2.2	.93	.98	.97
B	2.2	2	2.5	.93	.98	.97
C	2.2	2	2.5	.93	.98	.97
D	2	1.6	1.6	.93	.98	.98
E	2	1.6	1.6	.94	.98	.98

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 1518
 ACTUAL FLOW RATE: 1615

LOS	SERVICE FLOW RATE	V/C
A	374	.15
B	670	.27
C	1066	.43
D	1597	.64
E	2521	1

LOS FOR GIVEN CONDITIONS: E

1985 HCM:TWO-LANE HIGHWAYS

FACILITY LOCATION.... SOUTH KIHAI RD N. OF WAIMAHAIHAI ST
 ANALYST..... PGP
 TIME OF ANALYSIS..... PM PEAK HOUR
 DATE OF ANALYSIS..... PROJECTED
 OTHER INFORMATION.... SOUNWAOP. 1995 WOP

A) ADJUSTMENT FACTORS

 PERCENTAGE OF TRUCKS..... 1.4
 PERCENTAGE OF BUSES..... .3
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0
 DESIGN SPEED (MPH)..... 50
 PEAK HOUR FACTOR..... .97
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 43 / 57
 LANE WIDTH (FT)..... 11
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)... 6
 PERCENT NO PASSING ZONES..... 0

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	2	1.8	2.2	.93	.96	.98
B	2.2	2	2.5	.93	.96	.98
C	2.2	2	2.5	.93	.96	.98
D	2	1.6	1.6	.93	.96	.98
E	2	1.6	1.6	.94	.96	.98

C) LEVEL OF SERVICE RESULTS

 INPUT VOLUME(vph): 1577
 ACTUAL FLOW RATE: 1626

LOS	SERVICE FLOW RATE	V/C
A	368	.15
B	660	.27
C	1052	.43
D	1572	.64
E	2482	1

LOS FOR GIVEN CONDITIONS: E

A P P E N D I X C

CAPACITY ANALYSIS CALCULATIONS

**CUMULATIVE
PEAK HOUR OF TRAFFIC**

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 30
 PEAK HOUR FACTOR..... .92
 AREA POPULATION..... 8000
 NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET..... SOUTH KIHEI ROAD
 NAME OF THE ANALYST..... PGP
 DATE OF THE ANALYSIS (mm/dd/yy)..... PROJECTED
 TIME PERIOD ANALYZED..... MID-DAY PEAK HOUR
 OTHER INFORMATION.... SOUWA1P. 1995 WP

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN
 CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	21	23	33	32
THRU	2	1	759	678
RIGHT	28	42	15	17

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	1	1	1
LANE USAGE	LT + R	LTR		

ADJUSTMENT FACTORS

Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	30	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	2	0	1
SOUTHBOUND	3	0	1

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	5.50	5.50	0.00	5.50
WB	5.50	5.50	0.00	5.50
MAJOR LEFTS				
SB	5.00	5.00	0.00	5.00
NB	5.00	5.00	0.00	5.00
MINOR THROUGHS				
EB	6.00	6.00	0.00	6.00
WB	6.00	6.00	0.00	6.00
MINOR LEFTS				
EB	6.50	6.50	0.00	6.50
WB	6.50	6.50	0.00	6.50

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
DATE AND TIME OF THE ANALYSIS..... PROJECTED ; MID-DAY PEAK HOUR
OTHER INFORMATION.... SOUWA1P. 1995 WP

CAPACITY AND LEVEL-OF-SERVICE

Page-3

MOVEMENT	FLOW-RATE v (pcph)	POTEN-	ACTUAL	SHARED		RESERVE		LOS
		TIAL CAPACITY c (pcph) P	MOVEMENT CAPACITY c (pcph) M	CAPACITY c (pcph) SH		CAPACITY c = c - v R SH		
MINOR STREET								
EB LEFT	23	95	81	>	82	81	>	57 58 >E E
THROUGH	2	115	105	>		105	>	103 > D
RIGHT	30	460	460			460		430 A
MINOR STREET								
WB LEFT	25	95	83	>		83	>	58 > E
THROUGH	1	115	105	>	169	105	>	97 104 >E D
RIGHT	46	409	409	>		409	>	364 > B
MAJOR STREET								
SB LEFT	35	478	478			478		443 A
NB LEFT	36	529	529			529		493 A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
DATE AND TIME OF THE ANALYSIS..... PROJECTED ; MID-DAY PEAK HOUR
OTHER INFORMATION.... SOUWA1P. 1995 WP

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 30

PEAK HOUR FACTOR..... .94

AREA POPULATION..... 8000

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET

NAME OF THE NORTH/SOUTH STREET..... SOUTH KIHEI ROAD

NAME OF THE ANALYST..... PGP

DATE OF THE ANALYSIS (mm/dd/yy)..... PROJECTED

TIME PERIOD ANALYZED..... PM PEAK HOUR

OTHER INFORMATION.... SOUWA1P. 1995 WP

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	27	9	42	32
THRU	1	0	645	850
RIGHT	51	35	15	46

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	1	1	1
LANE USAGE	LT + R	LTR		

ADJUSTMENT FACTORS

Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	30	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	2	0	1
SOUTHBOUND	3	0	1

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	5.50	5.50	0.00	5.50
WB	5.50	5.50	0.00	5.50
MAJOR LEFTS				
SB	5.00	5.00	0.00	5.00
NB	5.00	5.00	0.00	5.00
MINOR THROUGHGS				
EB	6.00	6.00	0.00	6.00
WB	6.00	6.00	0.00	6.00
MINOR LEFTS				
EB	6.50	6.50	0.00	6.50
WB	6.50	6.50	0.00	6.50

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
DATE AND TIME OF THE ANALYSIS..... PROJECTED ; PM PEAK HOUR
OTHER INFORMATION.... SOUWA1P. 1995 WP

CAPACITY AND LEVEL-OF-SERVICE

Page-3

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M		SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET								
EB LEFT	29	95	82	>	82	82	> 52	53 > E E
THROUGH	1	115	104	>		104	>	102 > D
RIGHT	54	364	364			364		310 B
MINOR STREET								
WB LEFT	10	95	77	>		77	>	67 > E
THROUGH	0	115	104	>	234	104	>	187 104 > D D
RIGHT	37	494	494	>		494	>	457 > A
MAJOR STREET								
SB LEFT	34	564	564			564		529 A
NB LEFT	45	420	420			420		375 B

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... WAIMAHAIHAI STREET
 NAME OF THE NORTH/SOUTH STREET.... SOUTH KIHEI ROAD
 DATE AND TIME OF THE ANALYSIS..... PROJECTED ; PM PEAK HOUR
 OTHER INFORMATION.... SOUWA1P. 1995 WP.

1985 HCM: TWO-LANE HIGHWAYS

FACILITY LOCATION.... SOUTH KIHEI RD N. OF WAIMAHAIHAI ST
 ANALYST..... PGP
 TIME OF ANALYSIS..... MID PEAK HOUR
 DATE OF ANALYSIS..... PROJECTED
 OTHER INFORMATION.... SOUNWAIA. 1995 WP

A) ADJUSTMENT FACTORS

 PERCENTAGE OF TRUCKS..... 2.29
 PERCENTAGE OF BUSES..... .36
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0
 DESIGN SPEED (MPH)..... 50
 PEAK HOUR FACTOR..... .94
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 47 / 53
 LANE WIDTH (FT)..... 11
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)... 6
 PERCENT NO PASSING ZONES..... 0

B) CORRECTION FACTORS

 LEVEL TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	2	1.8	2.2	.93	.98	.97
B	2.2	2	2.5	.93	.98	.97
C	2.2	2	2.5	.93	.98	.97
D	2	1.6	1.6	.93	.98	.98
E	2	1.6	1.6	.94	.98	.98

C) LEVEL OF SERVICE RESULTS

 INPUT VOLUME (vph): 1549
 ACTUAL FLOW RATE: 1648
 SERVICE

LOS	FLOW RATE	V/C
A	374	.15
B	670	.27
C	1066	.43
D	1597	.64
E	2521	1

LOS FOR GIVEN CONDITIONS: E

1985 HCM:TWO-LANE HIGHWAYS

FACILITY LOCATION.... SOUTH KIHEI RD N. OF WAIMAHAIHAI ST
 ANALYST..... PGP
 TIME OF ANALYSIS..... PM PEAK HOUR
 DATE OF ANALYSIS..... PROJECTED
 OTHER INFORMATION.... SOUNWA1P. 1995 WP

A) ADJUSTMENT FACTORS

 PERCENTAGE OF TRUCKS..... 1.4
 PERCENTAGE OF BUSES..... .3
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0
 DESIGN SPEED (MPH)..... 50
 PEAK HOUR FACTOR..... .97
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 43 / 57
 LANE WIDTH (FT)..... 11
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)... 6
 PERCENT NO PASSING ZONES..... 0

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	2	1.8	2.2	.93	.96	.98
B	2.2	2	2.5	.93	.96	.98
C	2.2	2	2.5	.93	.96	.98
D	2	1.6	1.6	.93	.96	.98
E	2	1.6	1.6	.94	.96	.98

C) LEVEL OF SERVICE RESULTS

 INPUT VOLUME(vph): 1635
 ACTUAL FLOW RATE: 1686

LOS	SERVICE FLOW RATE	V/C
A	368	.15
B	660	.27
C	1052	.43
D	1572	.64
E	2482	1

LOS FOR GIVEN CONDITIONS: E

Appendix D

Drainage and Erosion Control Report

DRAINAGE AND EROSION CONTROL REPORT

FOR

KIHEI PUBLIC LIBRARY

KIHEI, MAUI, HAWAII

TMK: 3-9-12:13

PREPARED FOR:

**DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
STATE OF HAWAII**

PREPARED BY:

**RICHARD M. SATO & ASSOCIATES, INC.
CONSULTING CIVIL AND STRUCTURAL ENGINEERS
2115 WELLS STREET
WAILUKU, MAUI, HAWAII 96793**

DECEMBER 30, 1992

I. LOCATION

The project site is located in the heart of Kihei Town along Waimahaihai Street, approximately 200 feet makai of South Kihei Road. The site is bordered on the south by Kalama Park, to the east by the Kihei Fire Station, to the north by Waimahaihai Street and to the west by residential lots. The project site is identified by TMK: 3-9-12:13 (See Exhibit A).

II. PROJECT DESCRIPTION

The project consists of a library building, on-site open parking, road widening and related improvements along Waimahaihai Street and landscaping within the 1.93 acre site.

III. FLOOD HAZARD

The project site including Kalama Park is located within Zone AO (areas of 100 yr. shallow flooding) with an average depth of inundation of 1-ft. Other areas closer to the shoreline are within Zone AH (areas where the flood elevation's 7-Ft. above MSL). Isolated patches of Kalama Park are located within Zone C and are classified as areas of minimal flooding. The above information was obtained from the "Flood Insurance Rate Maps" for the County of Maui, see Exhibit B.

IV. DRAINAGE

A. EXISTING CONDITIONS

The site is undeveloped and overgrown with brush, kiawe trees and have good ground cover. Under existing conditions the site produces runoff at a rate of 0.83 cubic feet per second (cfs). This is based on a 10-year, 1-hour storm. Existing storm runoff from the project site generally flows towards the center of the property, then percolates into the ground. The water table is approximately 3 ft. below existing grade in this area.

Offsite runoff from lands mauka of the project does not enter the site. Runoff from the Kihei Fire Station sheet flows into Kalama Park, and runoff from other areas drains into Waimahaihai Street and flows down the street a short distance before draining into the sea. (see Exhibit C)

B. DEVELOPED CONDITIONS

Once developed, the project will produce runoff at the rate of 2.99 cfs. The 2.16 cfs increase is due to the projects various improvements as indicated in Section II, Project Description.

Existing drainage patterns will be maintained. The site will be filled to raise the ground elevation approximately 2 to 3 feet. A subdrain system will be installed on site to handle all the runoff from the project site. Drain inlets distributed across the site will collect onsite runoff into an underground perforated pipe subdrain system or wet well.

C. HYDROLOGIC AND HYDRAULIC CALCULATIONS

Storm runoff calculations were prepared using the Rational Method calculation were based on a one-hour storm with a recurrence interval of 10-years. (See Appendix A). Tables and Charts from the Drainage Master Plan for the County of Maui were referenced.

D. CONCLUSIONS:

Due to the onsite containment of the project's surface runoff, no significant adverse drainage impacts to downstream properties will result.

V. EROSION CONTROL:

Estimated soil loss was calculated using the Universal Soil Loss Equation in accordance with the County of Maui's Grading Ordinance concerning erosion control.

Calculations show that a maximum of 17.3 tons/acre/year of soil may be lost during grading operations. 2,590 tons/acre/year is the maximum allowable annual soil loss rate. Normal soil erosion control measure during construction (See Appendix B) should be sufficient for this project with no excessive soil loss occurring.

Charts and tables from the "Soil Surveys of Islands of Kauai, Oahu, Maui, Molokai and Lanai" and the "Erosion and Sediment Control Guide for Hawaii" prepared by the Soil Conservation Service, Department of Agriculture were referenced.

APPENDIX A
HYDROLOGIC AND HYDRAULIC CALCULATIONS

HYDROLOGIC AND HYDRAULIC CALCULATIONS

FOR

KIHEI PUBLIC LIBRARY

I. DRAINAGE RUNOFF CALCULATIONS

A. Existing Conditions (10 Year, 1-Hr. Storm)

1. Runoff Coefficient

Infiltration (High) = 0.00
Relief (Flat) = 0.00
Vegetal Cover (High) = 0.00
Development Type (Open) = 0.15
0.15

2. Existing Runoff from Project Site

Area (A) = 1.93 Acres
L = 130 Ft.
S = $6/130 = 0.046 = 4.62\%$

Tc = 16 Min
i₁₀ = 1.5"/hr.
I₁₀ = 2.85"/hr.
Q₁₀ = CiA
= 0.15(2.85)(1.53) = 0.83 cfs

B. Developed Conditions

1. Runoff Coefficient

Infiltration (Medium) = 0.07
Relief (Flat) = 0.00
Vegetal Cover (Good) = 0.03
Development Type (Library) = 0.40
0.50

2. Developed Runoff from Project Site

Area (A) = 1.93 Acres
L = 130 Ft.
S = 2.3%
Tc = 10 Min
i₁₀ = 1.5"/hr.
I₁₀ = 3.10"/hr.
Q₁₀ = CiA
= 0.50(3.00)(1.53) = 2.99 cfs

APPENDIX B
SOIL EROSION CALCULATIONS

SOIL EROSION CALCULATIONS

1. SITE CONDITIONS DURING CONSTRUCTION:

An area of approximately 1.93 acres will be graded at once.

Soil within the project site is classified as Dune Land (DL). Dune Land consists of hills and ridges of sand drifted and piled by wind. The sand is dominantly from eroded coral and sea shells. This type of soil exhibits high permeability, low runoff and an erosion hazard which is slight to moderate.

2. HESL SOIL LOSS FOR THE PROJECT DURING CONSTRUCTION

Erosion Rate, as set forth by the County of Maui Ordinance:

$$E = R K L S C P$$

Where:

E = Soil Loss in tons/acre/year
R = Rainfall Factor = 150 tons/acre/year
K = Soil Erodibility Factor = 0.10%
L = Slope Length = 25 Feet
S = Slope Gradient = 14%
LS = Slope-Length Factor = 1.15
C = Cover Factor = 1.0 (Bare Soil)
P = Control Factor = 1.0
(Construction Site)

$$\begin{aligned} E &= (150 \text{ tons/acre/year}) (0.10) (1.15) \\ &\quad (1.0) (1.0) \\ &= 17.3 \text{ tons/acre/year} \end{aligned}$$

3. ALLOWABLE SOIL LOSS FOR SITE:

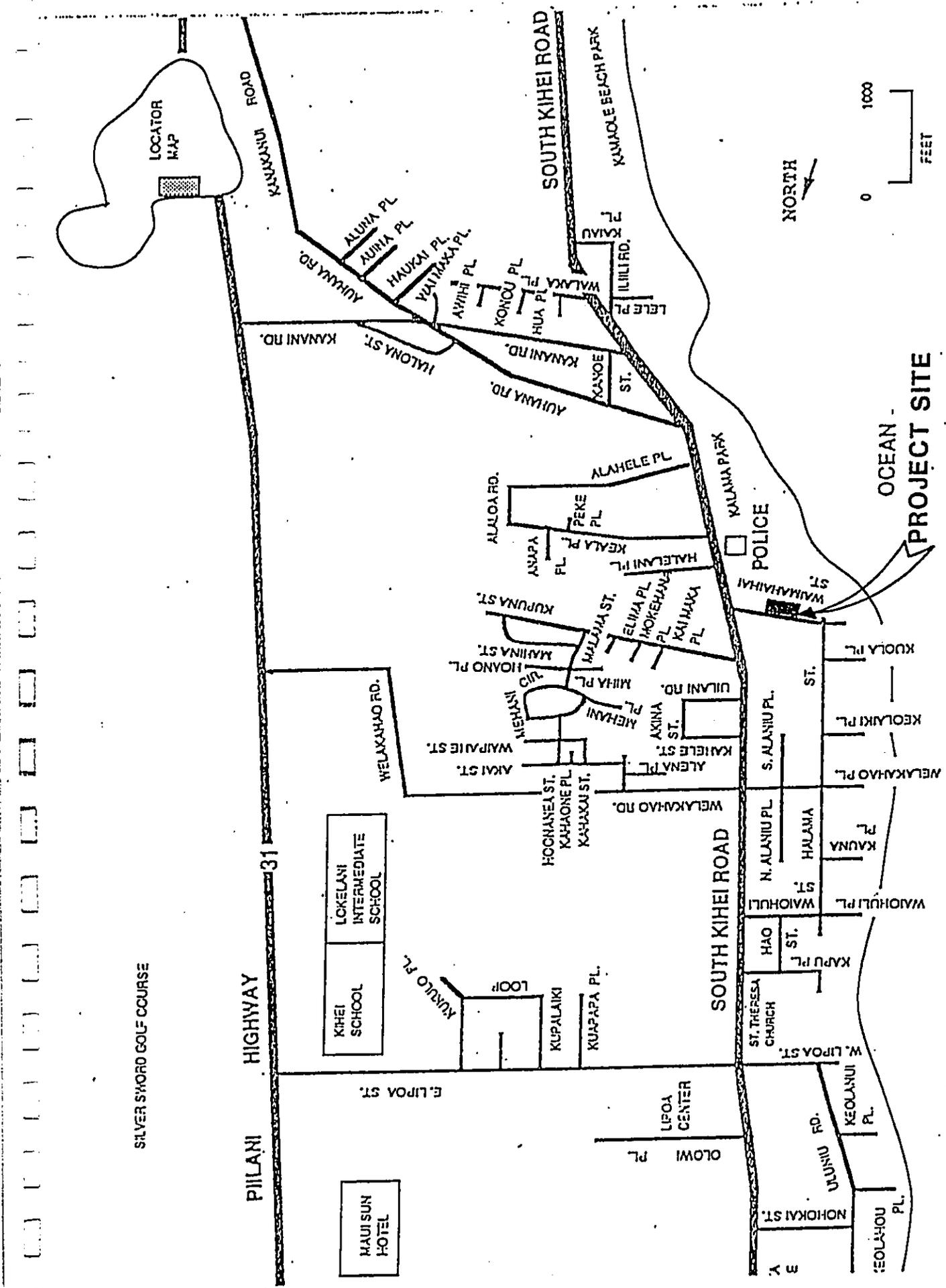
Coastal Water Hazard (D) = 2 (Class A Water)
Downstream Hazard (F) = 4
Duration of Site Work = 1/2 year
Maximum Allowable Construction Area x Erosion
Rate = 5,000 tons/year
Project Construction Area = 1.93 acre
Maximum Allowable Rate = $5,000/1.93$
= 2,590 tons/acre/year

4. CONCLUSION:

The Maximum Allowable Erosion Rate of 2,590 tons/acre/year is greater than the Estimated Construction Erosion Rate of 17.3 tons/acre/year. Normal soil erosion control measures during construction should be sufficient to prevent excessive soil loss from occurring.

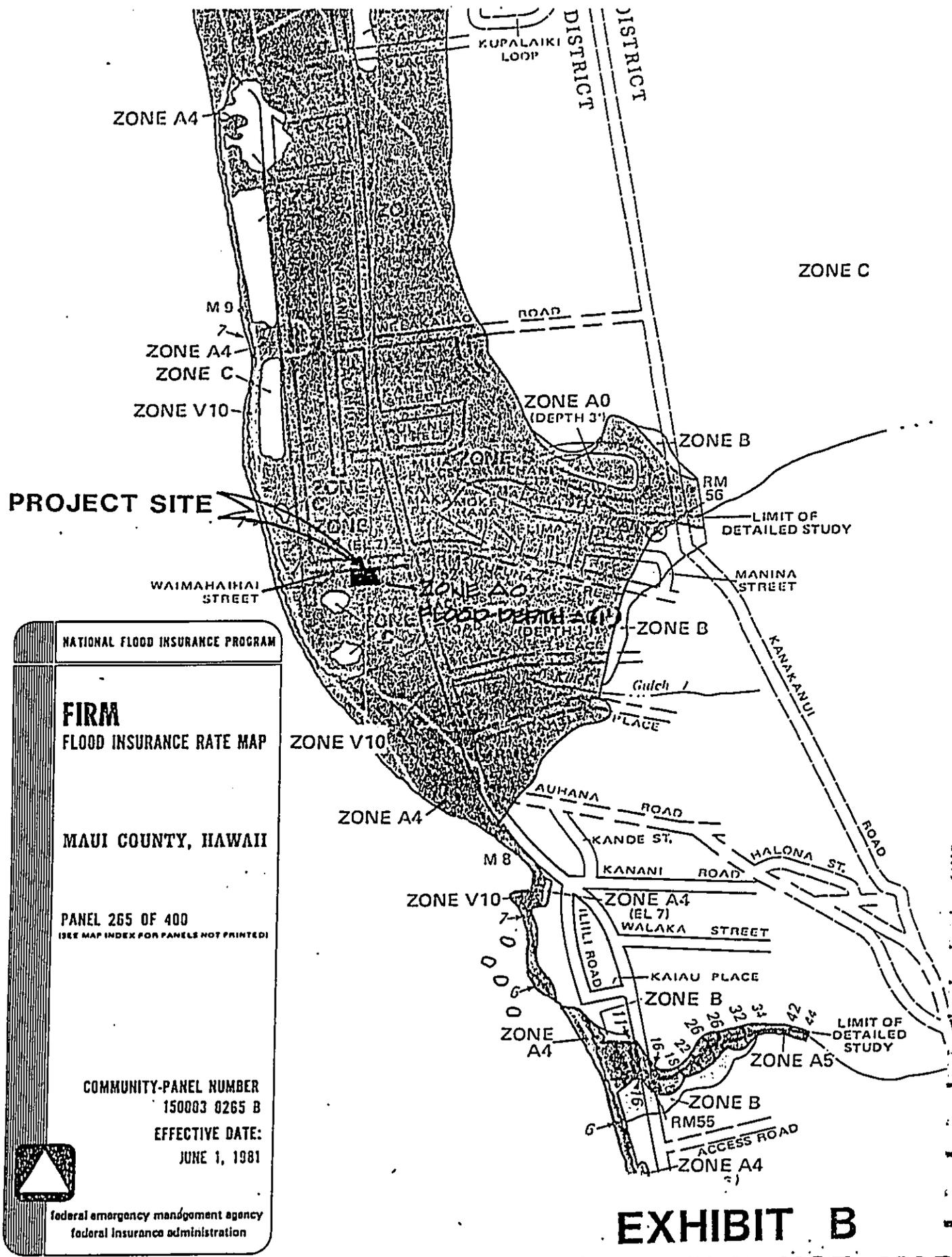
5. EROSION CONTROL PRACTICE DURING CONSTRUCTION:

1. Minimize time of construction.
2. Dust control by temporary water sprinkler systems or water wagons both if necessary.
3. All exposed areas shall be protected immediately after grading is completed by grassing or mulching.
4. All exposed slopes (cut and fill) shall be protected by grassing and by constructing temporary swales at the top of slopes.



LOCATION MAP

EXHIBIT A



LOT 62

LOT 67

LOT 69

LOT 71

WAIMAHAIHAI ROAD

LOT 61

NEW
KIHEI LIBRARY

LOT 60

LOT B
AREA = 1.93 ACS.

LOT 59

DRAINAGE MA

SCALE: 1" = 40'

