

JOHN WAIHEE
GOVERNOR



Dr. Herman Aizawa
SUPERINTENDENT

STATE OF HAWAII
OFFICE OF DISTRICT SUPERINTENDENT
DEPARTMENT OF EDUCATION
54 HIGH STREET, 4TH FLOOR, ROOM 401
WAILUKU, MAUI, HAWAII 96793

July 26, 1994

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

SUBJECT: Kihei Elementary School II
TMK 3-9-19:por.6
Kihei, Maui, Hawaii

REC'D
94 JUL 27 AM 11:57
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

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 June 23, 1994 OEQC Bulletin. Letters received during the public comment period as well as our response have been included in the Final Environmental Assessment.

As the accepting agency, we are forwarding herewith one (1) copy of the OEQC Bulletin Publication Form, and four (4) 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,

for Ralph M. Murakami
District Superintendent

RMM:hf
Enclosures

1994-08-08-MA-*FEA*-Kihei Elementary
School II

AUG 8 1994

***Final
Environmental Assessment
Kihei Elementary School II***

Prepared for

**Maul School
Development Partnership**

July 1994



***Final
Environmental Assessment***

Kihei Elementary School II

Prepared for

**Maui School
Development Partnership**

July 1994



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Preface

Maui School Development Partnership proposes to construct Kihei Elementary School II, in Kihei, Maui, Hawaii (TMK 3-9-19:por. 6). Although no State or County lands or funds are being used to construct the school, the facility is being built with the understanding that the State of Hawaii will enter into a long-term lease for use of the premises as a public school. An Environmental Assessment is being prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, Environmental Impact Statement Rules. The Environmental Assessment documents the project's technical characteristics and environmental impacts, and advances findings and conclusions relative to the significance of the project.

Summary

Applicant and Landowner

The applicant for the project is the Maui School Development Partnership. The land owner is KOAHE Limited Partnership.

Contact Person

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

Property Location and Description

The applicant, Maui School Development Partnership, proposes to develop Kihei Elementary School II, a public elementary school facility located in Kihei, Maui, Hawaii.

The twelve (12) acre project site adjoins Kananui Road, and is defined by TMK 3-9-19: por. 6. The site is currently undeveloped, and predominantly vegetated with buffelgrass and kiawe trees.

The existing Kihei Elementary School services students from Kindergarten to Grade 5. This existing facility has a current enrollment of 1,128 students. Because current and projected enrollment demands exceed the capacity of the existing school, a second elementary school is necessary to meet educational facility requirements for the Kihei-Makena region.

The conceptual plans for the proposed Kihei Elementary School II incorporate a functional design with natural landscaping and vegetation. The proposed single-level facility will ultimately include fifteen (15) buildings consisting of 40 permanent and eight (8) portable classrooms. Proposed improvements also include administrative, cafeteria/multi-purpose, computer, faculty, library, outdoor playcourt, resource, and restroom facilities. Additional site improvements include a drainage system and retention basin/ play field, landscaping, underground utilities, and separate 6-stall and 95-stall parking lots.

Assuming all applicable permits are obtained, the construction of classroom facilities is anticipated to begin in April 1995, with completion targeted for September, 1996. Estimated project cost is approximately \$21 million.

Access to the proposed elementary school facility will be provided by a primary driveway entrance along Kananui Road and a service entrance along Road "F", a proposed collector road.

Findings

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

From a long term perspective, the proposed project is not anticipated to result in adverse environmental impacts. The project should not have a significant negative impact on botanical and wildlife resources in the vicinity.

An earlier archaeological survey conducted by Hammatt and Shideler encompassed the project site. The survey identified one (1) site (Site 2632) within the limits of the subject property. This site was described as a historic ranch site. However, a recent archaeological study indicates that this could have been a structure not necessarily associated with ranching activities. According to an informant interview, the structure was formerly utilized as a dwelling by some of his relatives. The informant also indicated that his relatives lived in the house from the 1920's through World War II. The site is not anticipated to be significant in the context of historic preservation.

The project should have significant beneficial effects upon educational services in the Kihei-Makena region. The existing elementary school facility is already overcrowded and the need for a second elementary school facility is significant.

With the implementation of regional traffic improvements as well as project-specific improvements, the proposed project is not anticipated to have any adverse impacts on traffic operations in the vicinity. Surface runoff from the site will be addressed by concrete drainage inlets that will collect runoff from the project site. An onsite retention basin/playfield, with an emergency spillover, will store the runoff, and convey it to the Road "F" drainage system. The development of the school is not expected to result in any adverse impacts to adjacent and downstream properties. The project is not anticipated to have adverse impacts upon other infrastructure or public service systems.

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

Chapter 1

Project Overview

PROJECT OVERVIEW

A. PROPERTY LOCATION, EXISTING USE, AND LAND OWNERSHIP

The applicant, Maui School Development Partnership, proposes to develop Kihei Elementary School II, a public elementary school facility located in Kihei, Maui, Hawaii. See Figure 1. The twelve (12) acre project site adjoins Kananui Road, and is defined by TMK 3-9-19:por. 6. See Figure 2. The site is currently undeveloped, and predominantly vegetated with buffelgrass and kiawe trees.

KOAHE Limited Partnership is the landowner of the underlying parcel. Dowling Company, Inc. is the general managing partner of KOAHE Limited Partnership.

B. PROPOSED ACTION

The applicant, Maui School Development Partnership, proposes to construct a new elementary school in Kihei to meet projected future enrollment demands, and relieve overcrowding at the existing Kihei Elementary School facility.

Kihei Elementary School, located on Lipoa Street, services students from Kindergarten to Grade 5. The existing facility has a current enrollment of 1,128 students. Because current and projected enrollment demands exceed the capacity of the existing school, a second elementary school is necessary to meet educational facility requirements for the Kihei-Makena region.

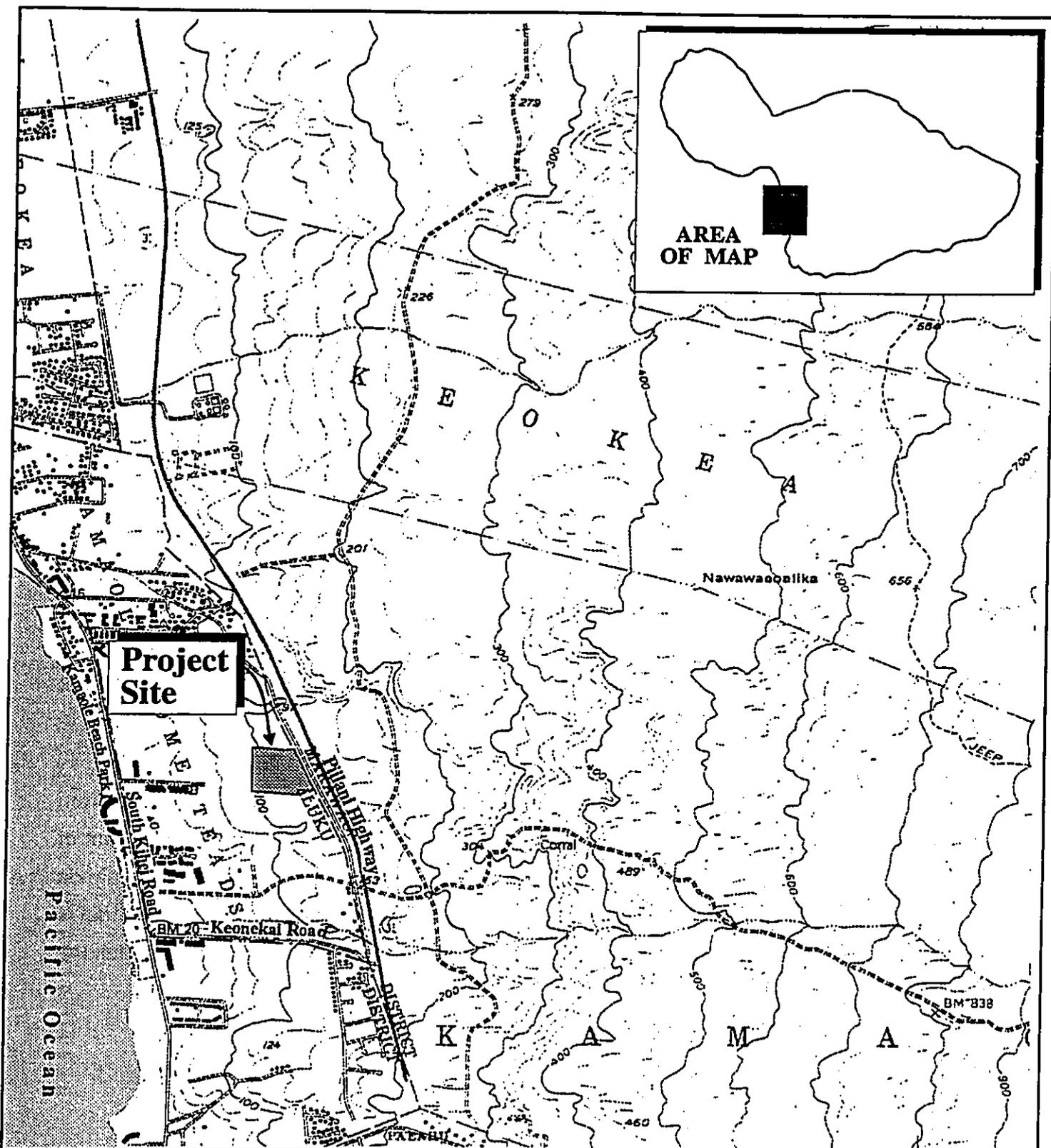
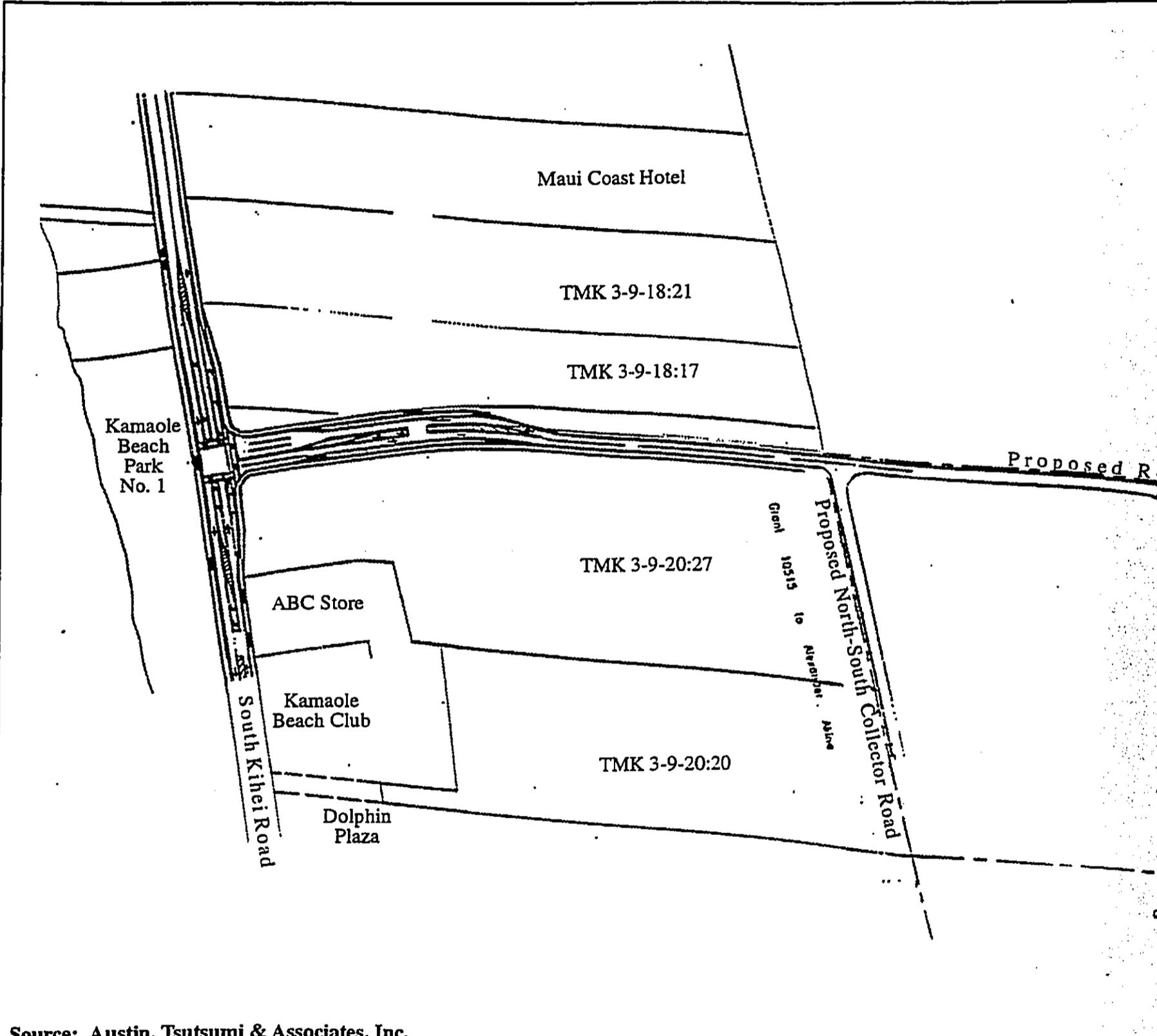


Figure 1 Kihei Elementary School II
Regional Location Map



Prepared for: Maui School Development Partnership





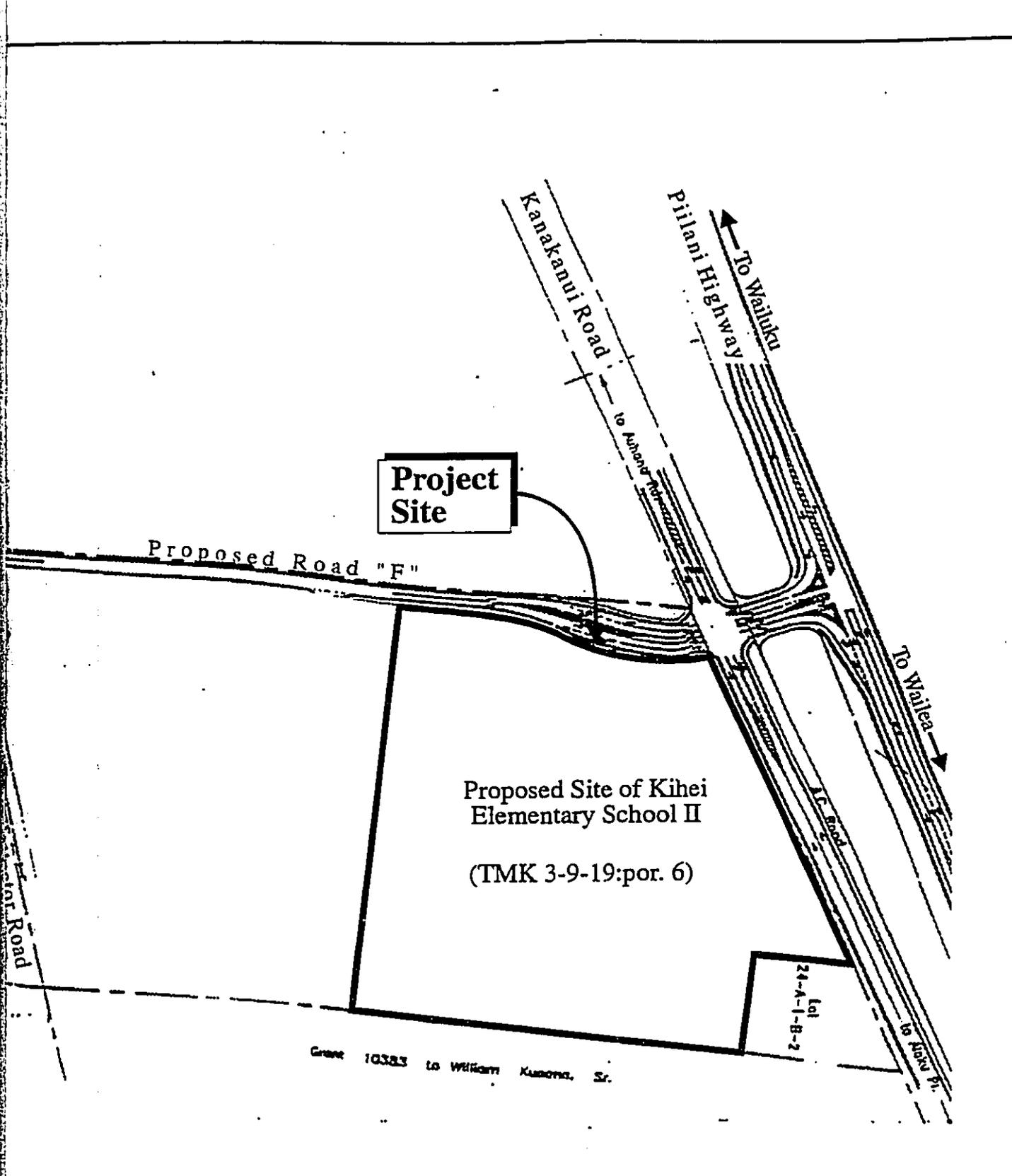
Source: Austin, Tsutsumi & Associates, Inc.

Figure 2

Kihei Elementary School
Project Location Map



Prepared for: Maui School Development Partnership



Kihei Elementary School II
Project Location Map



NOT TO SCALE

The conceptual plans for Kihei Elementary School II incorporate a functional design with natural landscaping and vegetation. The proposed single-level facility will ultimately include fifteen (15) buildings consisting of 40 permanent and eight (8) portable classrooms. See Figure 3. Proposed improvements also include administrative, cafeteria/multi-purpose, computer, faculty, library, outdoor playcourt, resource, and restroom facilities. See Figure 4, Figure 5, and Figure 6. Additional site improvements include a drainage system and retention basin/playfield, landscaping, underground utilities, and separate 6-stall and 95-stall parking lots.

The proposed project will involve the construction of an approximately 93,644 square foot elementary school facility. Assuming all applicable permits are obtained, the construction of classroom facilities is expected to begin in April, 1995, with completion targeted for September, 1996. The estimated project cost is approximately \$21 million.

Access to the proposed elementary school facility will be provided by a primary driveway entrance along Kananui Road, and a service entrance along Road "F", a proposed collector road.

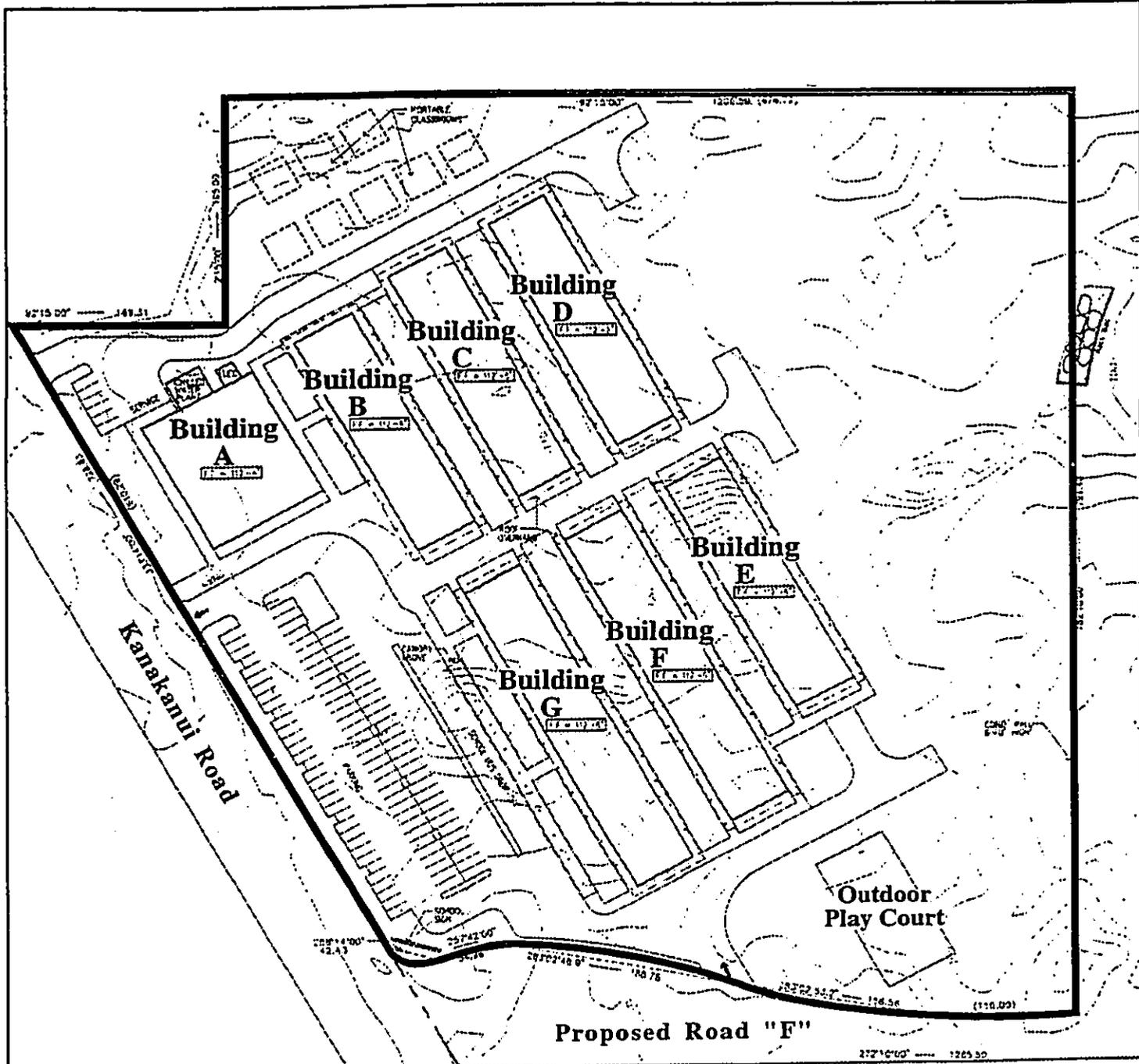
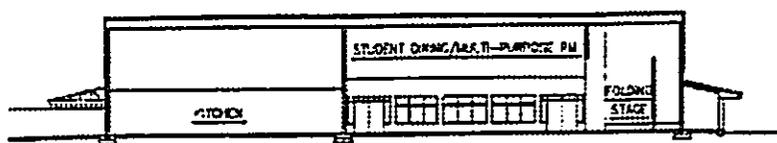


Figure 3 Kihei Elementary School II
Site Plan



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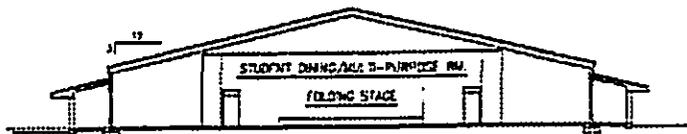


1
SK-2

Building Section

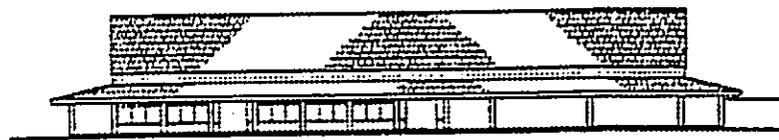


Northeast Elevation

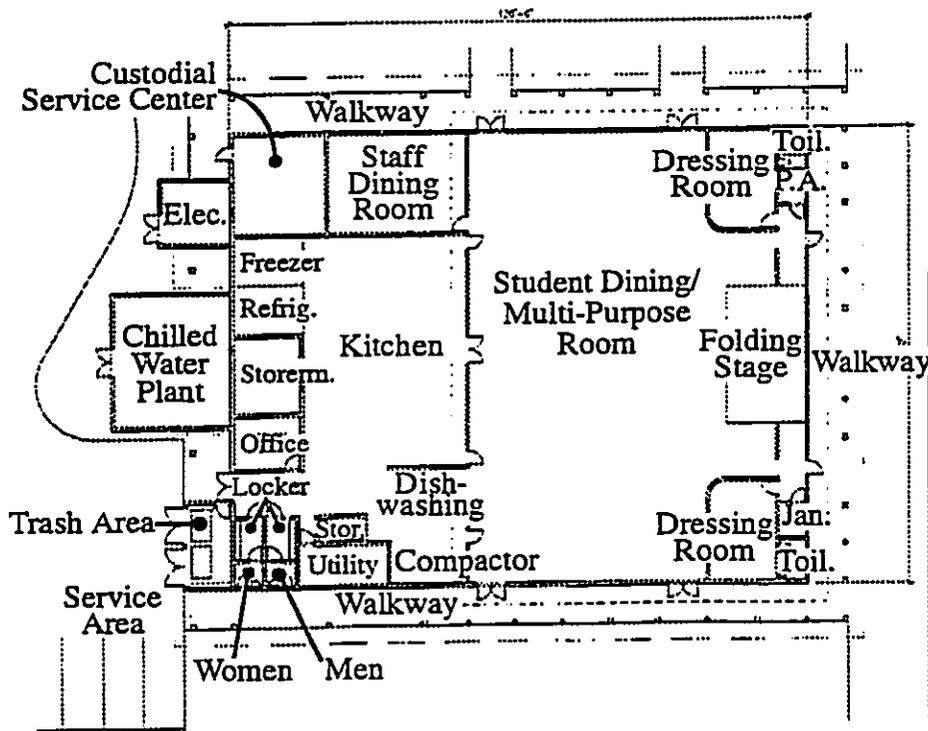


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SK-2

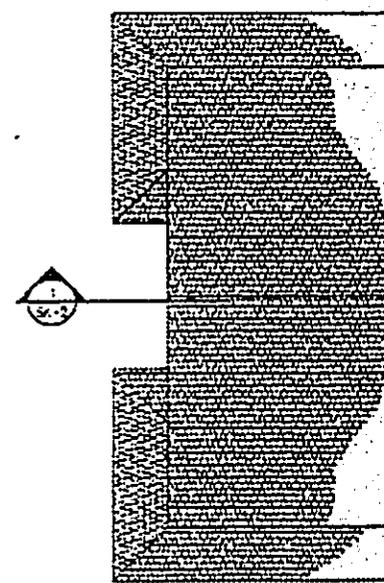
Building Section



Southwest Elevation



Floor Plan



Source: Gima, Yoshimori, Miyabara, Deguchi Architects, Inc.

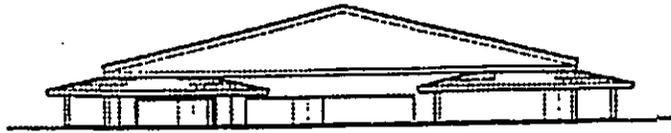
Figure 4

**Kihei Elementary School II
Multi-Purpose/Cafeteria Building -
Typical Elevations and Floor Plan**

Prepared for: Maui School Development Partnership



Elevation



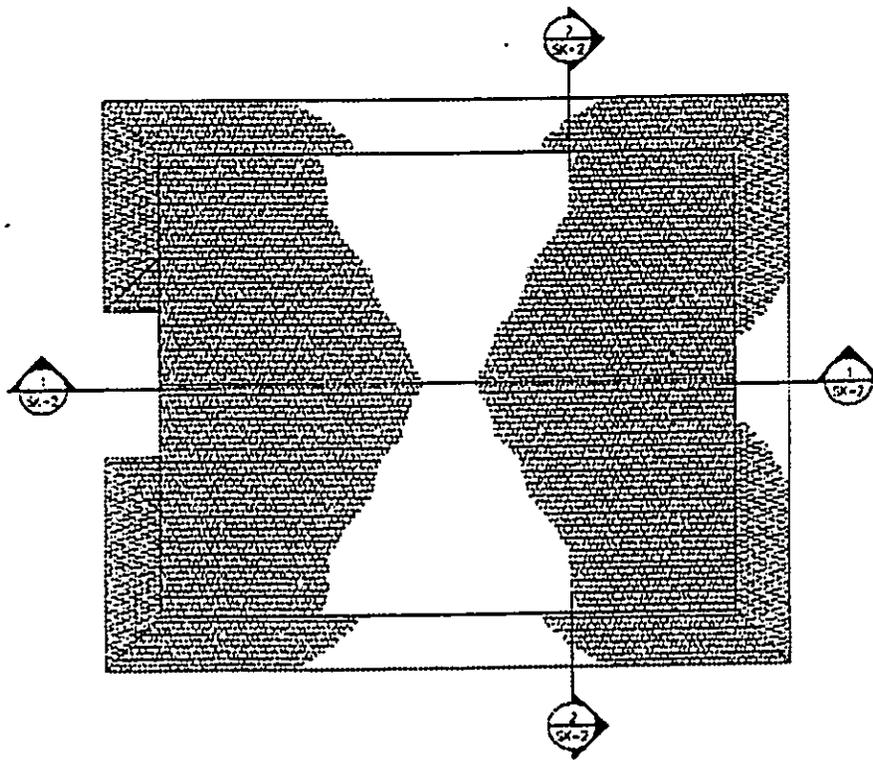
Southeast Elevation



Elevation



Northwest Elevation

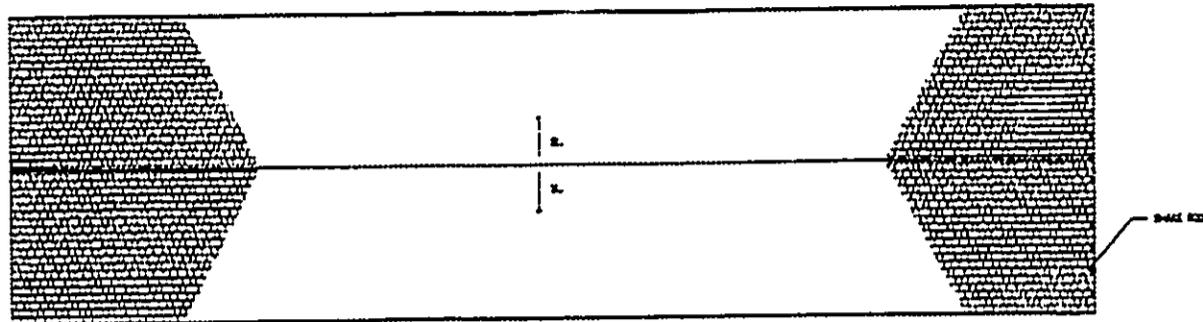


Roof Plan

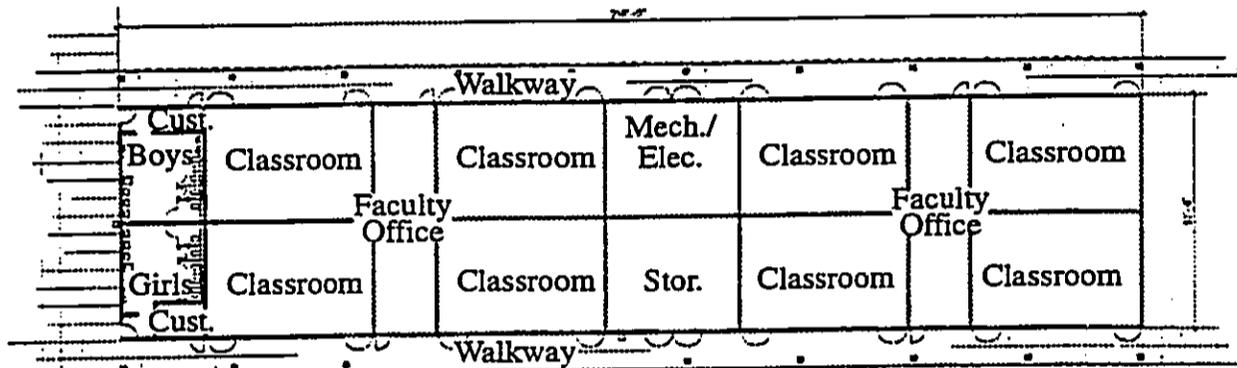
**Elementary School II
Cafeteria Building -
Elevations and Floor Plan**



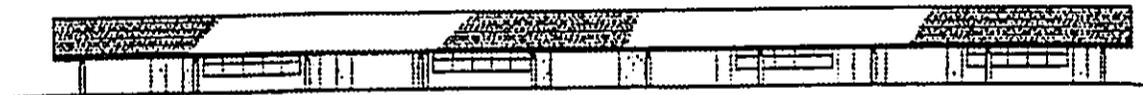
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Roof Plan



Floor Plan



Northeast Elevation



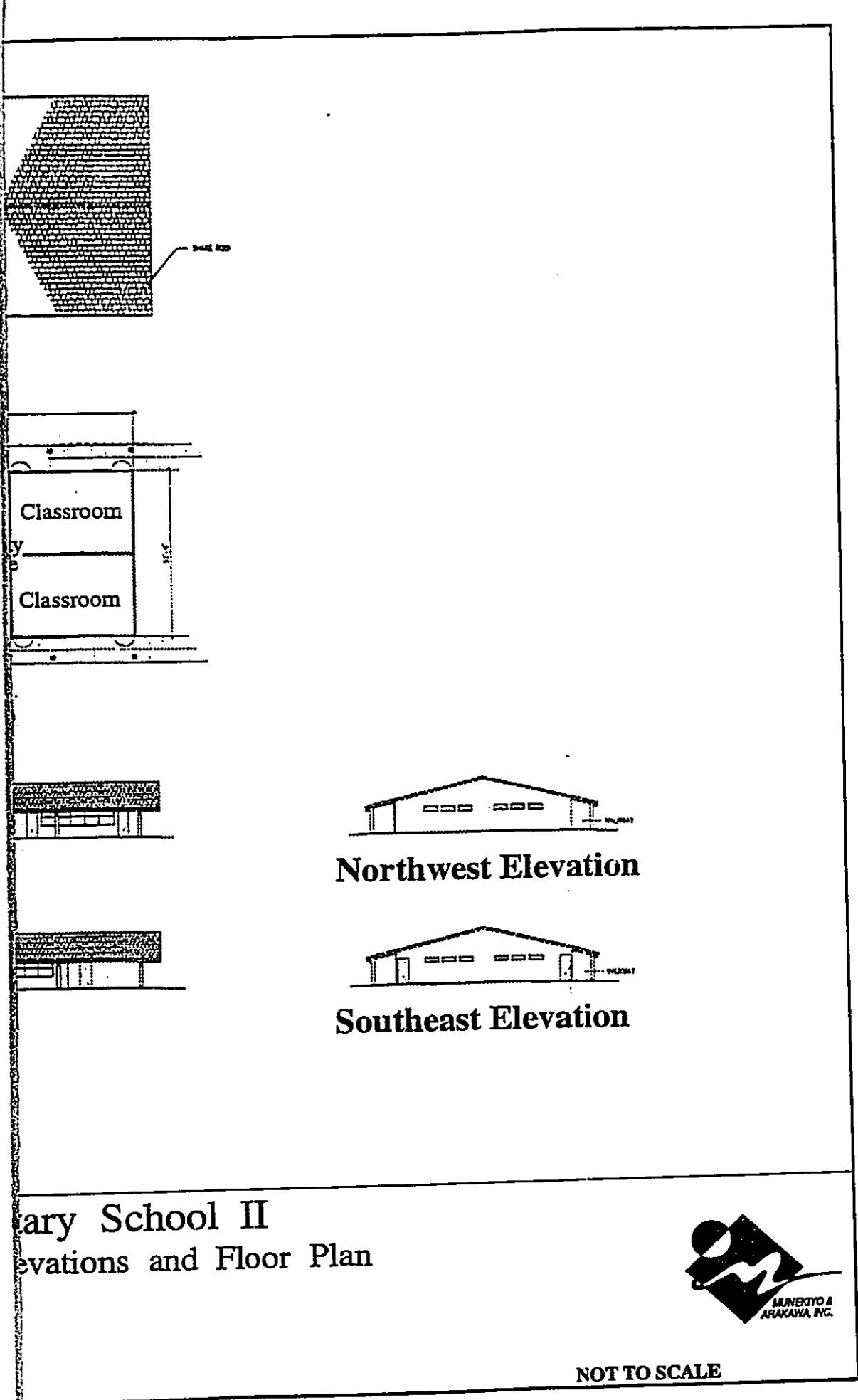
Southwest Elevation

Source: Gima, Yoshimori, Miyabara, Deguchi Architects, Inc.

Figure 5

Kihei Elementary School II
 Typical Classroom - Elevations and Floor Plan

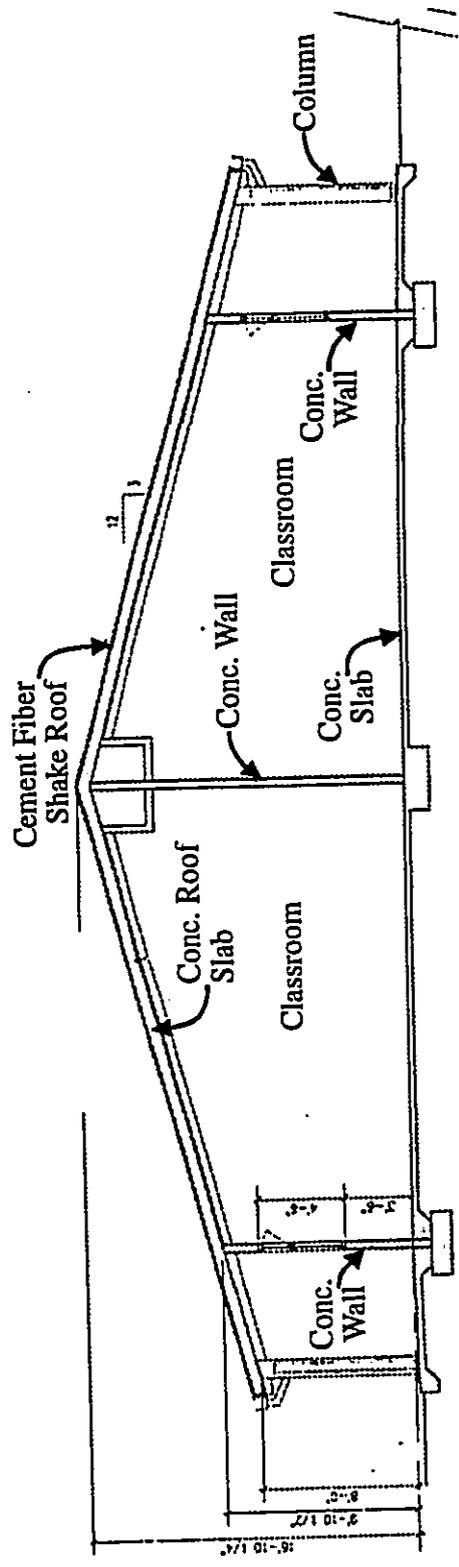
Prepared for: Maui School Development Partnership



Elementary School II
Elevations and Floor Plan



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Typical Building Cross-Section

Figure 6
 Kihei Elementary School II
 Typical Building Cross-Section



Prepared for: Maui School Development Partnership

Chapter II

Description of the Existing Environment

II. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. Surrounding Environment

The project site is located in Kamaole, Maui, within the southern portion of the Kihei District.

The proposed Road "F" abuts the northern boundary of the school site. At its eastern or mauka terminus, Road "F" would link with Kananui Road and Piilani Highway. At its western or makai terminus, Road "F" will link with South Kihei Road. Vacant and undeveloped lands lie to the north of Road "F". Further north lies the single family residential area around Auhana and Kanani Roads.

To the immediate west of the Kihei Elementary School II site is an 11.256-acre vacant parcel which is the site of the proposed Kamaole Heights residential subdivision. Vacant lands occupy the area to the west of the Kamaole Heights site. Properties along South Kihei Road are typified by the Kihei Akahi and Maui Vista Condominiums, and the Dolphin Plaza and Rainbow Mall Shopping Centers.

With the exception of a single-family residence situated beyond the project's southeastern quadrant, vacant and undeveloped lands border the south side of the subject property. Lands further south are occupied by the Keonekai Heights Subdivision.

Kananui Road forms the eastern or mauka boundary of the project site. A narrow strip of vacant land separates Kananui from Piilani Highway. Lands east or mauka of Piilani Highway are vacant and undeveloped.

2. **Climate**

The Kihei Coast, which encompasses the site, is generally sunny, warm and dry the entire year. In Kihei Town, the average annual high temperature is in the low 90's with the average low temperature being in the low 60's. 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 ten (10) inches per year to twenty (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 ten (10) to fifteen (15) miles per hour during afternoons, with slightly lighter winds during mornings and nights.

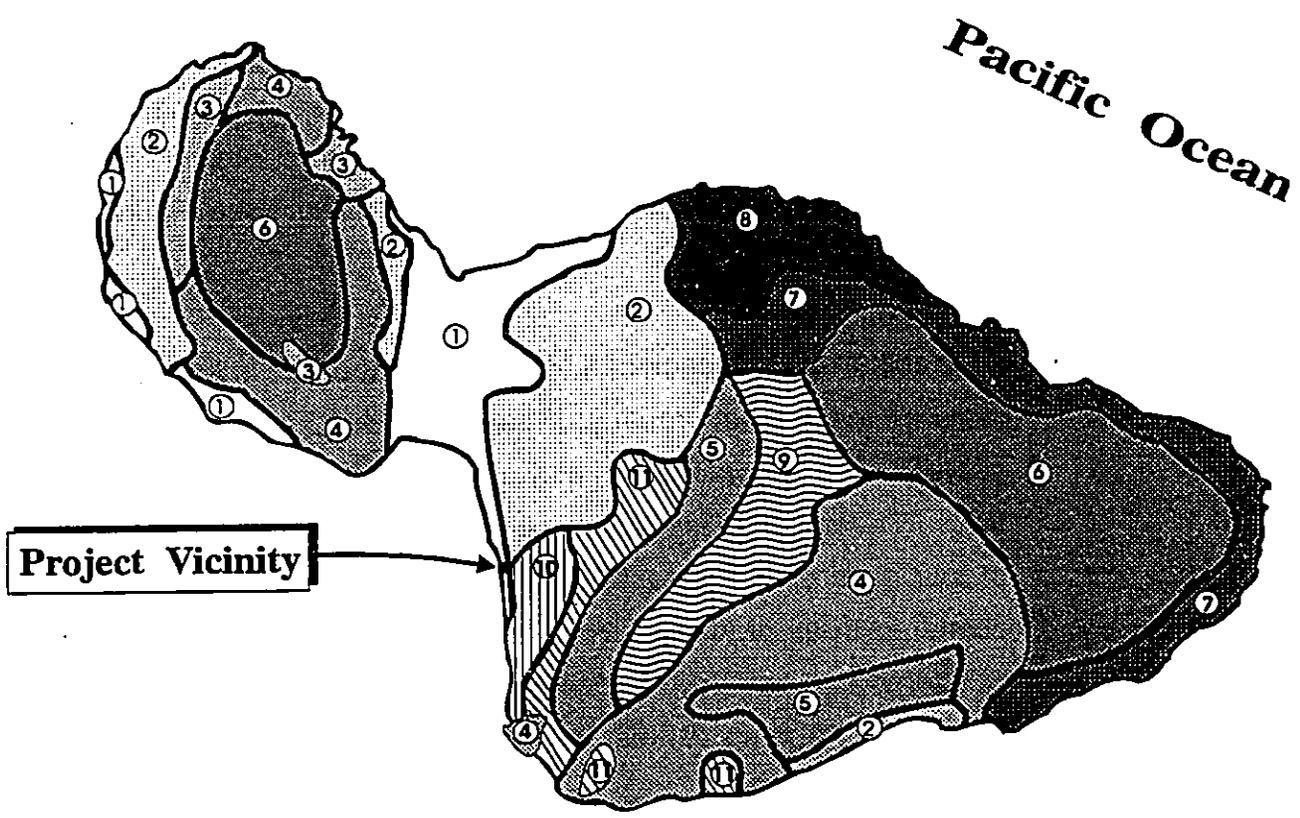
3. **Topography and Soil Characteristics**

The topography of the site ranges from relatively flat to gently sloping. Elevations range from approximately 96 feet above sea level to approximately 120 feet above sea level. Average slope of the site is approximately 3 percent.

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 7.

LEGEND

- | | |
|--|---|
| <p>① Pulahu-Ewa-Jaucas association</p> <p>② Waianoa-Keahua-Molokai association</p> <p>③ Honolulu-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 Laumala-Kaipoi-Olinda association</p> <p>⑩ Keawakapu-Makana association</p> <p>⑪ Kamaole-Oanapuka association</p> |
|--|---|



Map Source: USDA Soil Conservation Service

Figure 7 **Kihei Elementary School II**
Soil Association Map



Prepared for: Maui School Development Partnership

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The soil types at the project site are Puuone sand, 7 to 30 percent slopes (PZUE). See Figure 8.

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

4. **Flood and Tsunami Hazard**

According to the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency, the entire project site is designated as Zone C, areas of minimal flooding. See Figure 9.

5. **Flora and Fauna**

A botanical survey conducted by Char & Associates in August, 1993 included the subject property. See Appendix A. Vegetation on the subject property consists primarily of buffelgrass with scattered kiawe trees. The buffelgrass/kiawe association is fairly uniform, consisting of low mats of buffelgrass, from one (1) to two (2) feet tall, with scattered trees of kiawe. The tree cover is about 3 to 5 percent. Scattered throughout this vegetation type are shrubs of koa-haole, from three (3) to six (6) feet tall.

Avifauna and mammals common to the project site and surrounding areas are also typical of species found in the urbanized Kihei area. Species of birds commonly found in the area include the Northern Cardinal, Common Mynah, Golden Plover, Spotted Dove, House Finch, and Gray and Black Francolin. Feral mammals typically found

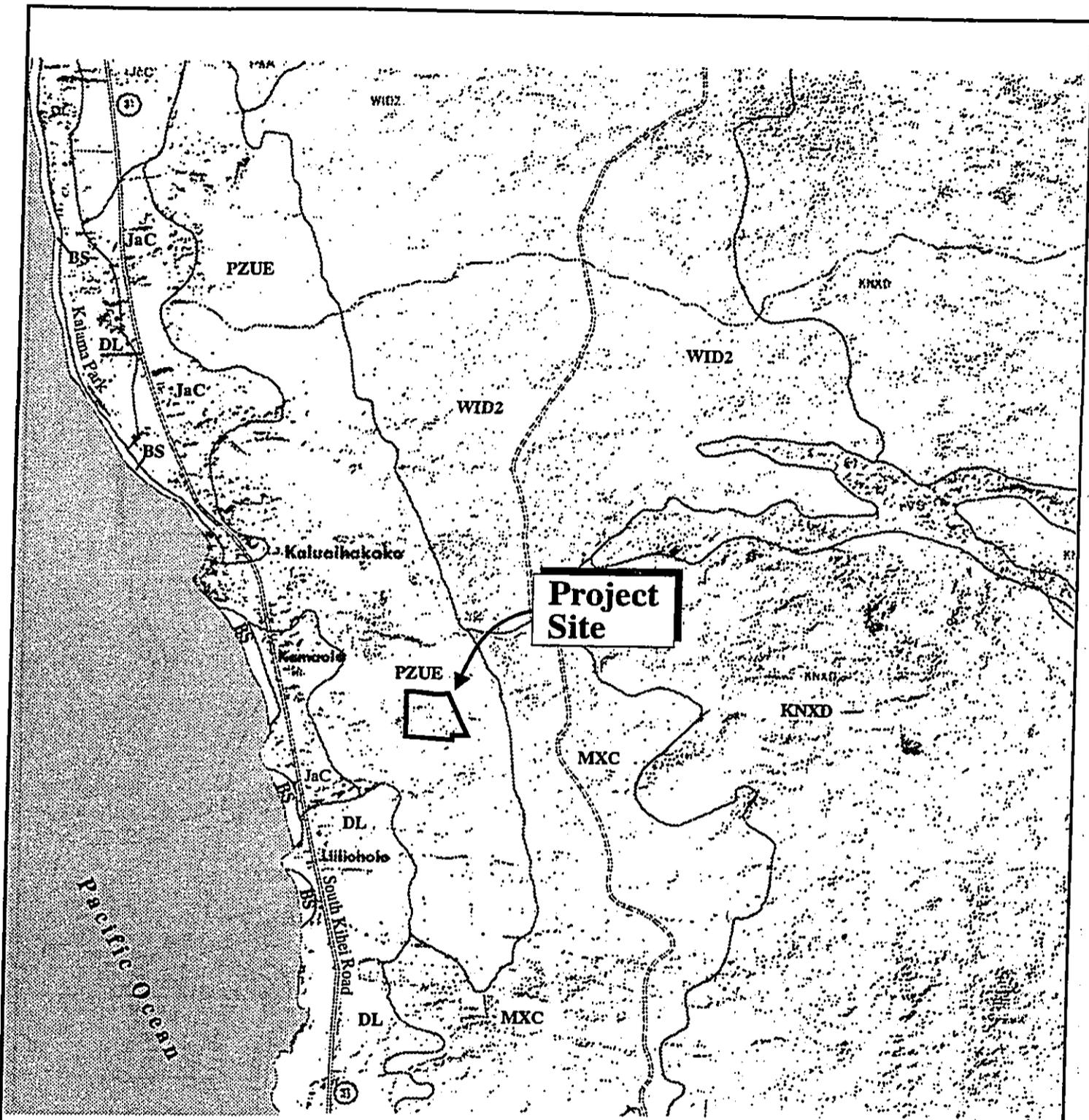


Figure 8

Kihei Elementary School II
Soil Classification Map



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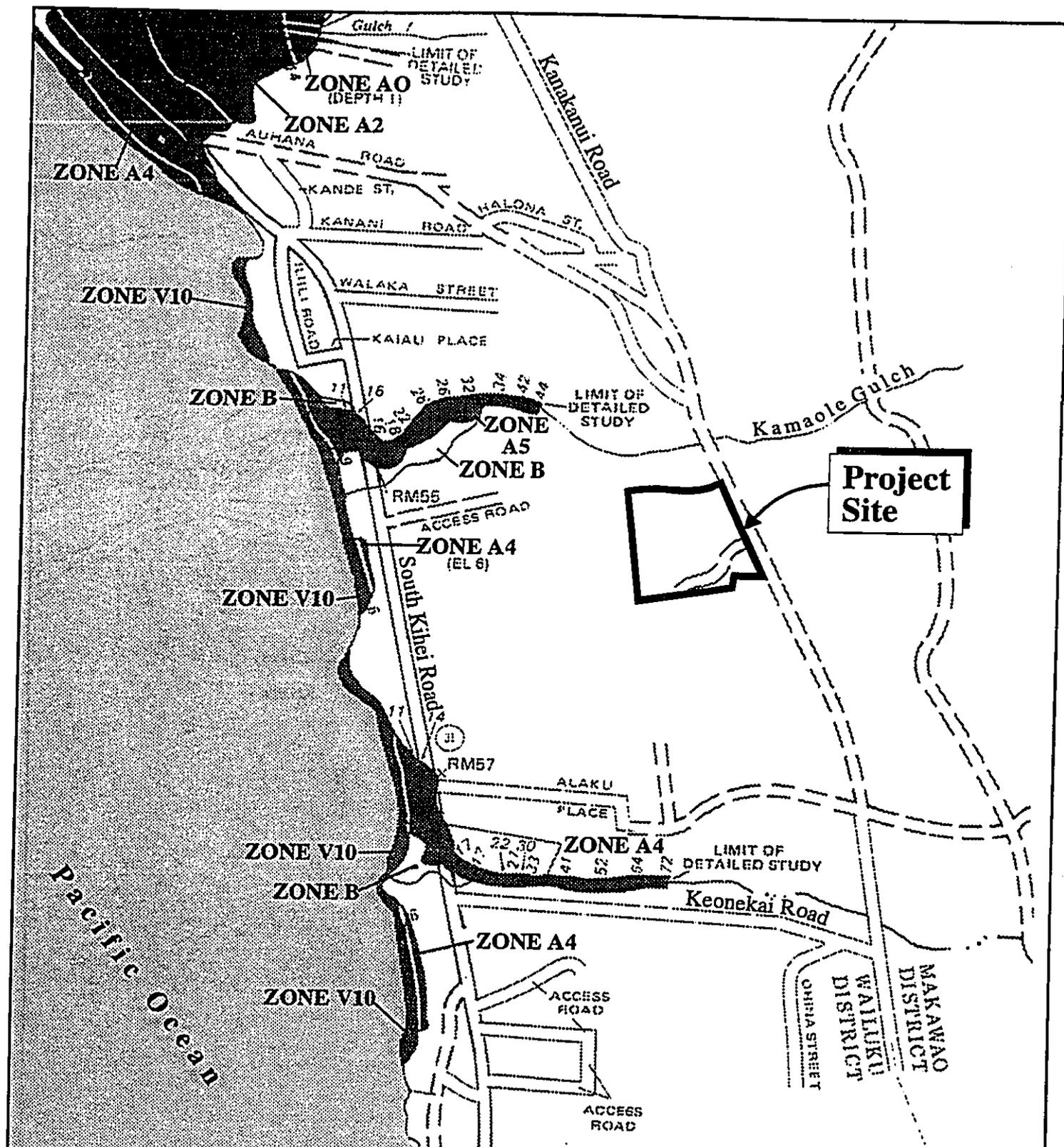
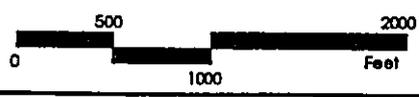


Figure 9 Kihei Elementary School II
Flood Insurance Rate Map



Prepared for: Maui School Development Partnership

in the area include cats, rats, mice, and mongoose. There are no known endangered or threatened wildlife species in the vicinity of the site.

6. **Air Quality**

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

7. **Noise Characteristics**

There are no significant noise generators in the vicinity of the project site. Background noise in this locale can be attributed to traffic travelling along Kananui Road and Piilani Highway.

8. **Scenic and Open Space Resources**

The site of the elementary school is located makai of Piilani Highway and is situated 2,000 feet from the shoreline. The proposed Road "F", which will extend from Piilani Highway to South Kihei Road, will serve as a major regional connector roadway. Moving towards the shoreline, there are resort, residential, and commercial properties. To the immediate west is an 11-acre vacant parcel which is the site of the proposed Kamaole Heights residential subdivision. To the north and south of the subject property are vacant parcels and residential subdivisions. The site is not a part of or in proximity to scenic corridors.

9. Archaeological Resources

An archaeological survey and testing conducted by Hammatt and Shideler included the subject project site (Cultural Services Hawaii, April, 1989). The Hammatt study included approximately 54 acres of land in Kamaole (TMK 3-9-18:17 and 21; 3-9-20:20 and 27; and 3-9-19:6). This study identified one (1) site (Site 2632) within the subject property. See Figure 10.

Site 2632 is located near the makai boundary of the property. The Hammatt study interpreted this to be an older ranch site. The most prominent features of this site are a large platform and associated dump. The rectangular platform is 29 meters long extending in the north south direction and 7.6 meters wide. A large trash dump is located 30 meters southwest of this platform. The study notes that trash in the immediate area including a kerosene stove, water tank, water pipes, pipe railing, a child's wagon wheels, a welded barbecue, and roofing iron suggest that the site may have been a ranch field station or cattle loading area. Other remains include a rock wall 0.7 meters in height constructed around a kiawe tree nine (9) meters east of the platform, the adjacent remains of a probable chicken coop, and a possible stone loading ramp to the northeast.

B. COMMUNITY SETTING

1. Community Character

From a regional standpoint, the subject parcel is part of the Kihei-Makena Community Plan region which stretches from Maalaea to La Perouse Bay. The 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

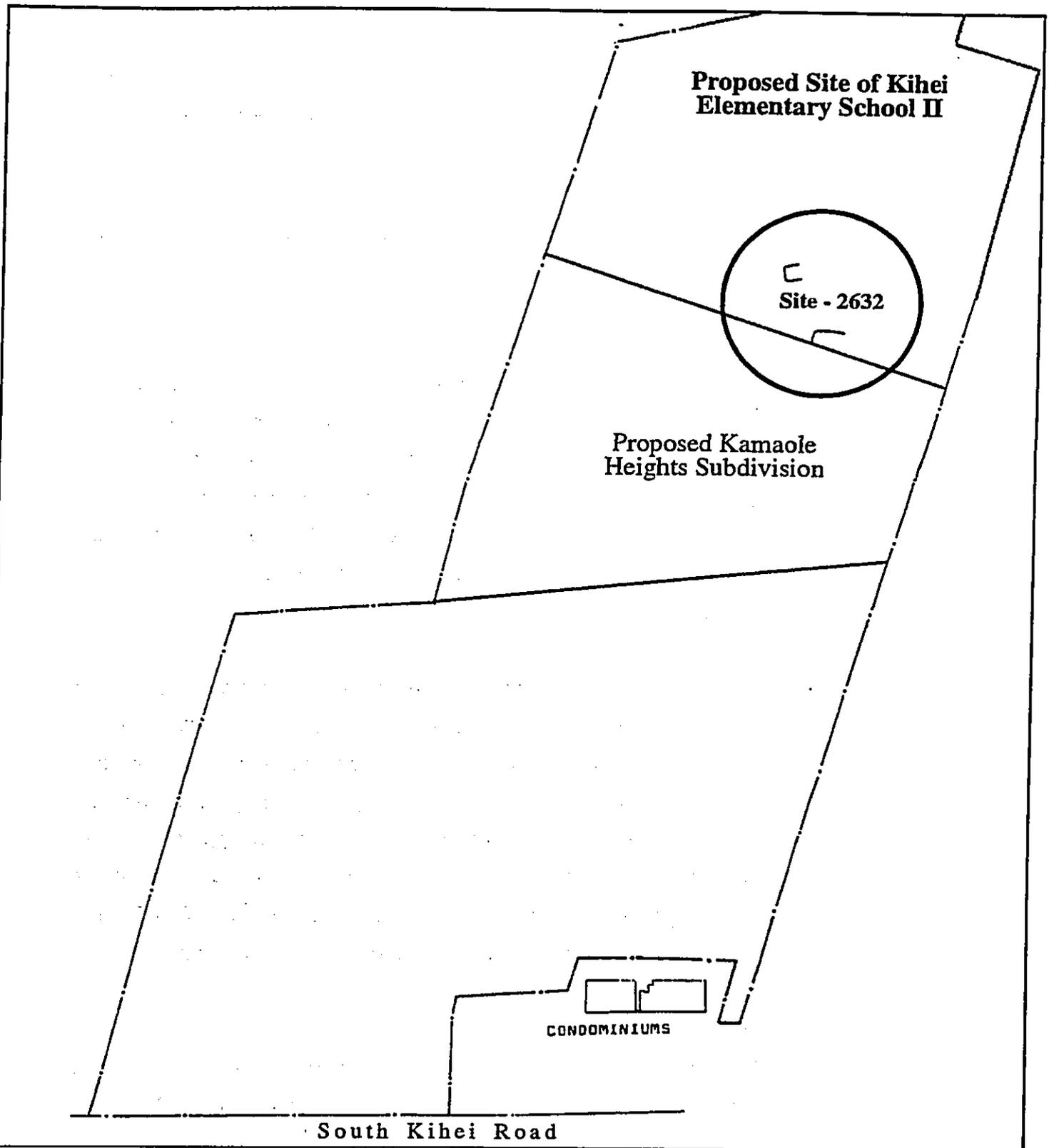


Figure 10 Kihei Elementary School II
 Location of Archaeological Site 2632



Prepared for: Maui School Development Partnership

NOT TO SCALE

Kihei serves as the commercial and residential center of the region with the master-planned communities of Wailea and Makena serving as the focal point for visitor activities.

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

2. Population

The population of the County of Maui has exhibited relatively strong growth over the past decade, with the 1990 population estimated to be 100,504, a 41.8 percent increase over the 1980 population of 70,847. Growth in the County is expected to continue, with resident population projections to the year 2000 and 2010 estimated to be 124,562 and 145,872, respectively (Community Resources, Inc., January, 1994).

Just as the County's population has grown, the resident population of the region surrounding the project site 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 20,092 and 24,846 respectively (Community Resources, Inc., January, 1994).

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, July/August, 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 opening of the Four Seasons Hotel, the Grand Hyatt, and Kea Lani Hotel has 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 facilities, such as the Azeka's and Long's Drugs complexes, will further bolster the regional economy.

4. **Housing**

The island-wide housing need for the year 2000 has been estimated at approximately 8,079 units, with 1,819 units occurring in the Kihei-Makena district. By the year 2010, an estimated 16,622 housing units will be needed to satisfy the island-wide demand for housing units. Approximately 23 percent, or 3,743 housing units will be required to fulfill the housing needs of the Kihei-Makena region (Community Resources, Inc., January, 1994).

5. **Police and Fire Protection**

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

Fire prevention, suppression and protection services are offered by the County's Department of Fire Control. The Kihei Station, which services the Kihei-Makena region is located on South Kihei Road, approximately one (1) mile north of the subject site.

6. **Medical Facilities**

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

7. **Recreational Facilities**

Diverse recreational opportunities are available in the Kihei-Makena region. Recreational facilities in close proximity to the project site include the Kalepolepo Park, Silversword Golf Course, Kalama Park, Kamaole Beach Parks I, II and III, and numerous other beach parks along the Kihei coastline. Shoreline recreation includes swimming, fishing, picnicking, snorkeling, and windsurfing.

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

8. **Schools**

The existing school service area encompasses approximately 32 square miles. The State Department of Education (DOE) operates two (2) schools in the Kihei area. Kihei Elementary School covers grades K to 5, with an enrollment of 1,128 students, while Lokelani Intermediate School includes grades 6 to 8, with an enrollment of 527 students. Public school students in grades 9 through 12 attend H.P. Baldwin High School in Wailuku (Telephone conversation with DOE employee, Aileen Shirota, April, 1994).

9. **Solid Waste**

Single-family residential solid waste collection service is provided by the County of Maui on a once-a-week basis. Residential solid waste collected by County crews are disposed at the County's 55-acre Central Maui Landfill located four (4) 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 from the Kahului area and from "Upcountry". 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. See Appendix C.

Piilani Highway is the primary arterial highway for South Maui. It is a two-lane, two-way high quality highway which runs 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.

Situated between its junction with Mokulele Highway to Wailea, South Kihei Road is a secondary arterial highway that is generally oriented in the north-south direction. The two-lane, two-way roadway generally follows the coastline through Kihei Town. In the vicinity of the project, South Kihei Road is unsignalized at its intersections with Kanani Road and Keonekai Road.

Kanakanui Road is a narrow, two-way roadway which is oriented in a north-south direction. Kanakanui extends from the Auhana Street area to Keonekai Road. In the vicinity of the project site, the average distance between Piilani Highway and Kanakanui Road is approximately 165 feet.

Access between Piilani Highway and South Kihei Road in the project vicinity is currently provided by two (2) roadways. Kanani Road is a mauka-makai collector roadway between Piilani Highway and South Kihei Road, located to the north of the project site. Located to the south of the project site, Keonekai Road also is a mauka-makai collector roadway between Piilani Highway and South Kihei Road.

Road "F" is proposed as a major collector road connecting Piilani Highway and South Kihei Road. Once implemented, Road "F" is expected to divert some of the existing and future traffic demands from Kanani Road and Keonekai Road.

2. **Water**

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

3. **Drainage**

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

Storm runoff from the Kamaole Drainage Basin converges at two (2) 72-inch diameter culverts near the Maui Coast Hotel. This leads to an 8.5 feet by 7 feet metal culvert which crosses South Kihei Road. An underground drainage collection system makai of the project site along South Kihei Road connects to the outlet of the 8.5 feet by 7 feet culvert. The runoff from the culvert and the underground collection system discharges to the ocean through an existing concrete lined channel.

4. **Wastewater Systems**

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 convey 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).

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

5. Electrical and Telephone Systems

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

Chapter III

Potential Impacts and Mitigation Measures

III. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. IMPACTS TO THE PHYSICAL ENVIRONMENT

1. Surrounding Land Uses

Various land uses, encompassing commercial, hotel, recreational, and multi- and single-family activities, are found within the general proximity of the project site.

Situated primarily along South Kihei Road, commercial zoned properties include the Dolphin Plaza, Kamaole Beach Center, Kamaole Shopping Center, Kihei Town Center, and Rainbow Mall. The Kihei Alii Kai, Kamaole Sands, Kihei Akahi, Maui Banyan, and Maui Vista condominiums represent the larger multi-family properties in the project area. Residential properties within the project vicinity include the Alaku, Kamaole Homesteads, Keonekai Heights, and Pacific Terrace Subdivisions. The Maui Coast Hotel and Kamaole Beach Parks I, II, and III, typify the hotel and recreational land uses within the project area.

The proposed elementary school facility is not expected to affect the land use and development of properties within the general project area.

2. Flora and Fauna

Vegetation associated with the project site consists primarily of introduced species such as buffelgrass and scattered kiawe trees. None of the plants are listed or proposed as endangered or threatened species. See Appendix A.

Avifauna and fauna in the vicinity are typical of the Kihei-Makena region. There are no known endangered or threatened species of wildlife found in the vicinity of the project site.

The proposed development of the site is not anticipated to have an adverse affect on botanical and wildlife resources.

3. **Air Quality**

Existing airborne pollutants are attributed primarily to vehicle-generated exhaust from the region's roadways.

Other sources of airborne pollutants typically include dust resulting from construction activities, and smoke from sugarcane harvesting operations occurring in the Central Maui plain. These sources are considered intermittent, and the generated particulates are quickly dispersed by the prevailing tradewinds.

Emissions from construction equipment and other vehicles involved in construction activities may temporarily affect the ambient air quality within the immediate vicinity. However, these effects shall be minimized by properly maintaining construction equipment and vehicles.

In addition, dust generated during construction, especially from earth-moving operations such as clearing, excavating, and trenching, may also result in a temporary decrease in ambient air quality. Mitigation measures include utilizing dust barriers, waterwagons and/or sprinklers to control dust, and watering graded areas after construction activity has ceased for the day.

4. **Noise Characteristics**

The project site is situated within an area encompassed by vacant, undeveloped lands, and with the exception of temporary construction activities, is not susceptible to adverse noise conditions.

Ambient noise conditions will be temporarily affected by construction activities. Heavy construction equipment such as bulldozers, dump trucks, front-end loaders, and material-transport vehicles, are anticipated to be the dominant noise-generating source during the construction period.

Proper equipment and vehicle maintenance are anticipated to minimize noise levels. In addition, equipment mufflers or other noise attenuating equipment may be necessary if noise levels are determined to be excessive. Construction activities will be primarily limited to daylight working hours.

In the long term, vehicles traveling along Kananui Road and Piilani Highway will be the primary source of indirect noise in the project area. Traffic along Kananui Road is typified by light vehicular movement, while Piilani Highway is characterized by higher traffic flows. The project site is setback an average distance of 165 feet makai (west) from Piilani Highway. The proposed classroom facilities will be setback an average distance of 195 feet from Kananui Road. The proposed setback distances are anticipated to mitigate potential vehicle-generated noise impacts.

It is noted that the school facility is anticipated to be air-conditioned which would further attenuate noise, as well as provide a cool and comfortable learning environment.

5. **Scenic and Open Space Resources**

The project site is located makai (west) of Kanakanui Road and is situated approximately 2,000 feet from the shoreline. With the exception of a single-family residence situated beyond the project's southeastern quadrant, the adjoining properties consist of vacant, undeveloped parcels.

The project site is not considered to be a part of, or in proximity to a scenic corridor.

6. **Archaeological Resources**

Site 2632 is centrally located along the western boundary of the project site. Its most prominent features include a large, rectangular platform and a trash disposal area. Evidence of previous ranching activity was also noted within the vicinity of this site.

A previous archaeological study conducted by Hammatt and Shideler indicated that Site 2632 may have been a historic ranch site (Cultural Surveys Hawaii, April 1989). The State Historic Preservation Division (SHPD) review determined that Site 2632 is no longer significant in the context of historic preservation.

A recent site inspection by interested community members and a State Historic Preservation Division (SHPD) staff archaeologist suggests that Site 2632 may have been an old dwelling rather than a ranch site.

A recent archaeological study indicates that this could have been a structure not necessarily associated with ranching activities. Refer

to Appendix B. According to informant interviews with a native Hawaiian resident of Maui who visited the site, the structure was formerly utilized as a dwelling by some of his relatives. The informant also indicated that his relatives resided in the dwelling from the 1920's through World War II.

Should any additional archaeological features be exposed during construction activities, work in the vicinity will cease and the SHPD will be immediately notified in order to establish the significance of the unearthed features, and to determine the nature and extent of any data recovery and/or preservation measures which may be warranted.

B. IMPACTS TO THE COMMUNITY SETTING

1. Land Use and Community Character

County zoning for the twelve (12) acre project site is R-2, Residential. Permitted uses within the R-2 district include publicly and/or privately owned schools. There will be no displacement of existing residences or other active uses as a result of the proposed action.

With the exception of a single-family dwelling adjoining the project's southeastern corner, the project site is currently surrounded by vacant, undeveloped parcels. The Pacific Terrace, Keonekai Heights, Keonekai Estates, Kamaole Homesteads and Alaku Subdivisions are in proximity of the project site.

The 79-lot Kamaole Heights Subdivision is planned for a vacant eleven (11) acre site abutting the project's makai (west) boundary. Complete build-out and occupancy of the subdivision is projected by

fall of 1996. In addition, Road "F" is proposed as a major east-west collector road linking South Kihei Road with Piilani Highway. As part of the Kamaole Heights development, a portion of Road "F" would be constructed to provide access to the subdivision. Residential projects with access on Alaku Place are currently under construction, with full build-out and occupancy anticipated by September, 1996.

The proposed project is considered compatible with the land use and development of the surrounding properties.

2. Economy

The proposed project is anticipated to accommodate the needs of the Kihei region's growing number of students. On a short-term basis, the proposed project will support construction and construction-related employment. The increased construction activities will also benefit local retail and commercial enterprises. Over the long-term, the proposed project will provide employment opportunities for the school's administrative, faculty, and support personnel. Moreover, the school provides a basic educational foundation for prospective future employees and residents.

3. Police, Fire, and Medical Services

The proposed project is not anticipated to affect the service capabilities of police, fire, and emergency medical operations. The project will not extend the existing service area limits for emergency services.

4. Recreational Services

The proposed project will include a playground area designated primarily for school use. Students for the new school are anticipated

to come from within the Kihei-Makena school service area. In this regard, the school itself is not considered a generator of new resident population which would place additional demands upon recreational resources. Impacts upon recreational resources should, therefore, be appropriately addressed when applications for multi- and single-family housing projects are filed.

5. **Educational Services**

The existing school service area encompasses approximately 32 square miles. The State Department of Education (DOE) operates two (2) public schools in the Kihei-Makena region. According to 1993-1994 enrollment statistics, Kihei Elementary School and Lokelani Intermediate School consists of 1,128 and 527 students, respectively. The existing Kihei Elementary School facility services students from Kindergarten to Grade 5, while Lokelani Intermediate School supports students from Grades 6 to 8. Both schools are located approximately two (2) miles north of the project site. Students enrolled in Grades 9 to 12 attend H.P. Baldwin High School in Wailuku, approximately fourteen (14) miles northwest of the project site (Telephone conversation with DOE employee, Aileen Shirota, April, 1994).

School size planning criteria are based upon schools servicing a desired number of students. "Desirable enrollment" represents an average number of students that are required to support the most effective range of activities, facilities, and curriculum. In addition, a "minimum student number" indicates the minimum point where the establishment of a new school becomes feasible. The school size enrollment planning criteria for elementary schools reflects a "minimum student number" of 400, and a "desirable enrollment" of

800. In addition, the DOE currently utilizes "rated capacity" to quantify the appropriate number of students that can be effectively accommodated by the existing classrooms, facilities, and teachers at each school (R.M. Towill Corp., August, 1992).

The existing Kihei Elementary School facility has an ideal capacity of 700 students, a design capacity of 900 students, and a "rated capacity" of 1,054 students. In addition to 32 permanent classrooms, 23 portable classrooms were constructed to meet the increasing demands for educational facilities and services associated with the region's rapid growth (Comprehensive Consulting Services of Hawaii, September, 1991).

Taking into consideration planned and future housing developments in the region as well as grade school attrition, a total of 1,800 students are anticipated within the service region. In this regard, the existing Kihei Elementary School, with its design capacity of 900 students, is inadequate to address projected increase.

According to DOE estimates for Kihei Elementary School II, daily attendance projections reflect an average attendance of 750 students. In addition, the school staff is anticipated to consist of approximately 61 administrative, faculty, and support employees (Telephone conversation with DOE employee, David Keala, May, 1994).

6. **Solid Waste**

A solid waste management plan will be developed in coordination with the Solid Waste Division of the County Department of Public

Works and Waste Management (DPWWM) for the disposal of materials resulting from site and construction activities.

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

C. IMPACTS TO THE INFRASTRUCTURE

1. Roadways

A Traffic Impact Analysis Report (TIAR) has been prepared for the proposed project. Refer to Appendix C. Kihei Elementary School II is expected to be open in September, 1996; accordingly, the year 1996 is utilized as the planning horizon for the TIAR. For the purpose of the TIAR, the maximum elementary school enrollment assumed was 1,000 students.

a. Road "F"

A primary access to the project site is proposed on Kananui Road, approximately 230 feet south of its intersection with Road "F". A service access driveway is planned on Road "F" about 220 feet makai (west) of its intersection with Kananui Road.

Initially, Road "F" is envisioned as a two-way, two-lane collector roadway which would divert some of the existing and future traffic demands from Kanani Road and Keonekai Road. Ultimately, Road "F" would become a multi-lane collector roadway, and could eventually be extended mauka (east) of Piilani Highway to provide access for future development in the vicinity.

b. Site Traffic

The trip rates for the proposed project were developed by correlating the vehicle trip generation data with school enrollment. Based on an estimated enrollment of 1,000 students, the proposed project is expected to generate 246 vehicles per hour (vph) during the AM peak hour, with 148 vehicles entering the site and 98 vehicles exiting the site.

During the mid-afternoon peak hour, the proposed project is anticipated to generate 210 vph, with 118 vehicles entering the site and 92 vehicles leaving the site. See Table 1. The

Table 1

TRIP GENERATION CHARACTERISTICS FOR THE PROPOSED KIHEI ELEMENTARY SCHOOL II		
		Vehicle Trips
AM Peak Hour	Enter	148
	Exit	98
	Total	246
PM Peak Hour	Enter	118
	Exit	92
	Total	210

Source: Appendix C

late-afternoon peak hour traffic generated by the proposed project was not considered significant and was not analyzed in the TIAR.

c. External Traffic

Traffic on Piilani Highway has increased at an annual rate of 6.66 percent. The traffic increase on South Kihei Road varies annually, from 4.55 percent to the north of the project site, and 0.42 percent to the south of the project site.

The Kamaole Homestead Subdivision project is assumed to be completely built-out and occupied, and was not included in the traffic impact analysis. The Kamaole Heights Subdivision and Road "F" are projected to be developed within the planning horizon. In addition, the residential developments with access on Alaku Place are also expected to be fully built-out and occupied within the planning horizon. Residents from the various Alaku Place projects are anticipated to utilize Road "F" as their primary access to South Kihei Road and Piilani Highway.

d. Traffic Volume Without Project

Traffic operating conditions of a roadway are expressed by its Level of Service (LOS). LOS "A", "B", and "C" reflect satisfactory levels of service, while LOS "D" is considered a minimum desirable operating level of service. LOS "E" and "F" indicate undesirable and unacceptable conditions, respectively.

During the 1996 AM peak hour without the project, the left turn movement from mauka (east) bound Road "F" to northbound Piilani Highway is expected to operate at LOS "F" under unsignalized conditions. Similarly, the left turn movements from Keonekai Road and from Kanani Road to

Piilani Highway are also expected to operate at LOS "F". During the 1996 AM peak hour without the project, Piilani Highway and South Kihei Road are expected to operate at LOS "D". The remaining intersections in the proposed school's vicinity are anticipated to operate at LOS "C" or better during the AM peak hour without the project.

Under unsignalized conditions, the left turn movement from mauka (east) bound Road "F" to northbound Piilani Highway is expected to continue to operate at LOS "F", during the mid-afternoon peak hour without the project. The left turn movement from makai (west) bound Road "F" to southbound South Kihei Road is expected to operate at LOS "E". The left turn movements from Kanani Road and from Keonekai Road to Piilani Highway are also expected to continue to operate at LOS "F". Piilani Highway, north of Kanani Road, is expected to operate at LOS "E". During the 1996 mid-afternoon peak hour, South Kihei Road is expected to operate at LOS "E" north of Kanani Road, and LOS "D" south of Keonekai Road. The remaining intersections in the proposed school's vicinity are projected to operate at LOS "C" or better during the mid-afternoon peak hour without the project.

e. **Traffic Volume With Project**

During the AM peak hour with the project, the left turn movement, from makai (west) bound Road "F" to southbound South Kihei Road, is expected to operate at LOS "D". The AM peak hour traffic operations within the rest of the proposed school's vicinity are not expected to be significantly affected by the traffic generated by the project.

The traffic operations during the mid-afternoon peak hour of traffic with the project are not expected to be significantly impacted by the site-generated traffic.

f. Recommended Roadway Improvements

i. General Recommendations:

The following improvements are recommended to accommodate projected 1996 traffic without the project:

- Road "F" should be constructed to improve access between Piilani Highway and South Kihei Road in the Kamaole area;
- Kananui Road should be stop-controlled at its intersection with proposed Road "F";
- The intersections of Piilani Highway and Kanani Road, Piilani Highway and Keonekai Road, and Piilani Highway and Road "F" should be signalized, when warranted, to mitigate the LOS "F" conditions expected during the 1996 peak hours of analysis without the project; and
- Kananui Road, between Alaku Place and Keonekai Road, should be restricted to local traffic only to mitigate the impact of the drainage crossing during severe rainstorms.

ii. Site-Related Recommendations:

The following improvements are recommended to accommodate the projected site-generated traffic:

- The primary access to the proposed elementary school should be located on Kananui Road, to minimize the number of driveways on Road "F". This driveway should be located as far south from Road "F" as possible to mitigate potential queuing problems;

-
- Kananui Road should be upgraded to County collector road standards, including curb, gutter, and sidewalks; and
 - Clear lines of sight from the project access driveways should be established to accommodate adequate intersection sight distance.

2. Water

Water will be furnished to the project site by the County domestic water system servicing the Kihei-Makena region. The estimated average daily demand for the proposed facility is projected to be approximately 49,000 gallons per day (gpd), with peak hour demand estimated to be 146,000 gpd. This estimate was determined by calculating the average daily water flow of approximately 60 gpd for each student and employee.

Water service for the new school will be provided by a proposed 8-inch offsite waterline along Kananui Road. The proposed waterline will diverge from the existing County water system in the vicinity of Alaku Place, and then proceed to Road "F" before continuing makai (west) to the Kamaole Heights Subdivision.

The proposed project may be subject to a facilities reserve charge for a proportionate share of improvements to the water supply system. In addition, storage assessment fees for reservoir storage costs may be required.

3. Wastewater

The new school facility is anticipated to connect with an 8-inch sewerline proposed for the Kamaole Heights Subdivision. The

proposed sewerline will be situated along the Road "F" right-of-way and extend makai (west) before connecting to the existing 15-inch County gravity sewerline along South Kihei Road.

The proposed Kihei Elementary School II project is estimated to generate an average flow of approximately 15,000 gpd. This estimate was derived from calculations utilizing an average per capita wastewater flow of approximately 18 gpd for each student and 23 gpd for each employee.

The Kihei Wastewater Reclamation Facility (KWRF) has a design capacity of 6.0 million gpd, with approximately 5.4 million gpd currently allocated. Concerns relating to the facility's capacity have surfaced as allocations approach the KWRF's design capability. It should be noted, that of the 50,000 gpd allocated for public/quasi-public improvements, approximately 46,640 gpd still remains available.

Proposed improvements to the KWRF would increase its design capacity to 8.0 million gpd. Sewer impact fees may be assessed for plant expansion costs and distribution system improvements. KWRF capacity allocations for the proposed project will be coordinated with the Department of Public Works and Waste Management (DPWWM).

4. **Drainage and Erosion Control**

The project site is situated at an elevation ranging from 124 feet to 94 feet mean sea level (msl), and slopes in a predominantly makai (west) direction. The site is situated within the Kamaole Gulch Drainage Basin which encompasses a total of 770 acres on both sides of Piilani Highway. Based on a 1-hour, 10-year storm and a

1-hour, 50-year storm, the proposed project is estimated to produce runoff at a rate of 23.44 cfs and 24.93 cfs, respectively. Refer to Appendix D.

Concrete drain inlets will be used to collect storm runoff from the project. The runoff will then be conveyed to a retention basin/playfield situated in the northwest quadrant of the project site. The retention basin/playfield will feature an emergency spillover which will connect with the Road "F" drainage system improvements. Offsite runoff is not anticipated to enter the project site. The Road "F" drainage system improvements are currently being designed by Austin, Tsutsumi, & Associates, Inc. in conjunction with the development of the Kamaole Heights Subdivision. The development of Kihei Elementary School II is not expected to result in any adverse impacts to adjacent or downstream properties.

With regard to erosion control, natural vegetation will be left undisturbed in areas not needed for immediate construction, and exposed areas will be grassed or landscaped immediately upon the completion of grading operations.

Soil loss during construction is below the allowable rate established by the County.

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 (4) major land use districts in which all lands in the State are placed. These districts are classified "Urban", "Rural", "Agricultural", and "Conservation". The proposed elementary school is located within the "Urban" district and is compatible with the "Urban" classification. See Figure 11.

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.

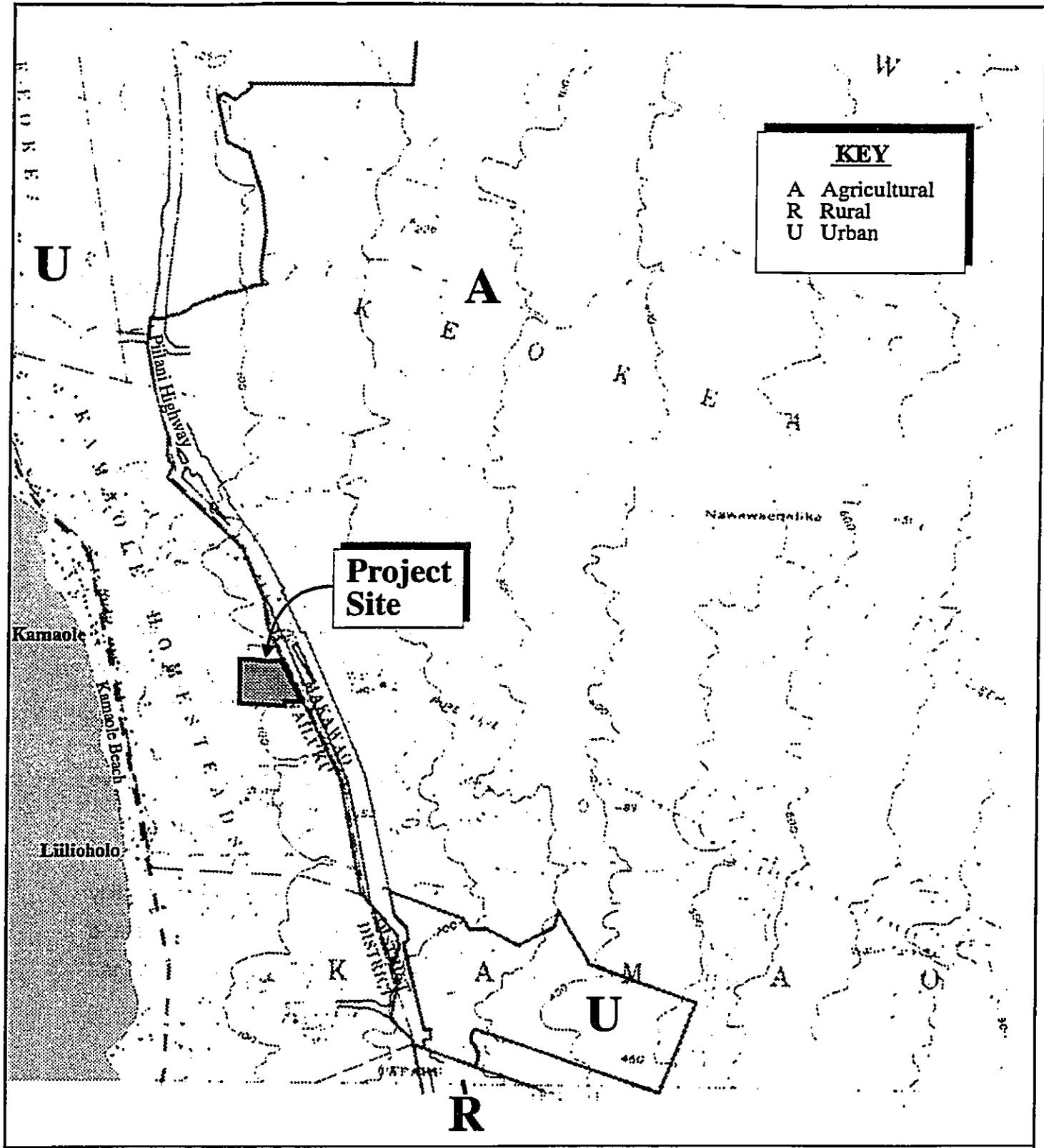


Figure 11 Kihei Elementary School II
State Land Use Classifications



Prepared for: Maui School Development Partnership

Policies:

1. Support the State and the Maui community in the provision of:
 - a) improvements and timely development of facilities; and
 - b) lower student/teacher ratios.
2. Require that quality educational facilities and services are available to all residents.

C. KIHEI-MAKENA COMMUNITY PLAN

The subject parcel is located in the Kihei-Makena Community Plan region which is one of nine (9) 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 proposed project would facilitate the implementation of the Kihei-Makena Community Plan by addressing the following plan recommendation:

Coordinate with the State Department of Education for the following improvement to educational facilities to meet projected school needs in the Kihei region.

- Monitor need for expanded facilities at Kihei School and additional elementary and intermediate schools when required to accommodate growth.

The Kihei-Makena Community Plan sets forth detailed land use spatial relationship for the region. The subject property is currently designated Single-Family in the Community Plan. See Figure 12. School use is not contrary to the existing Community Plan designation.

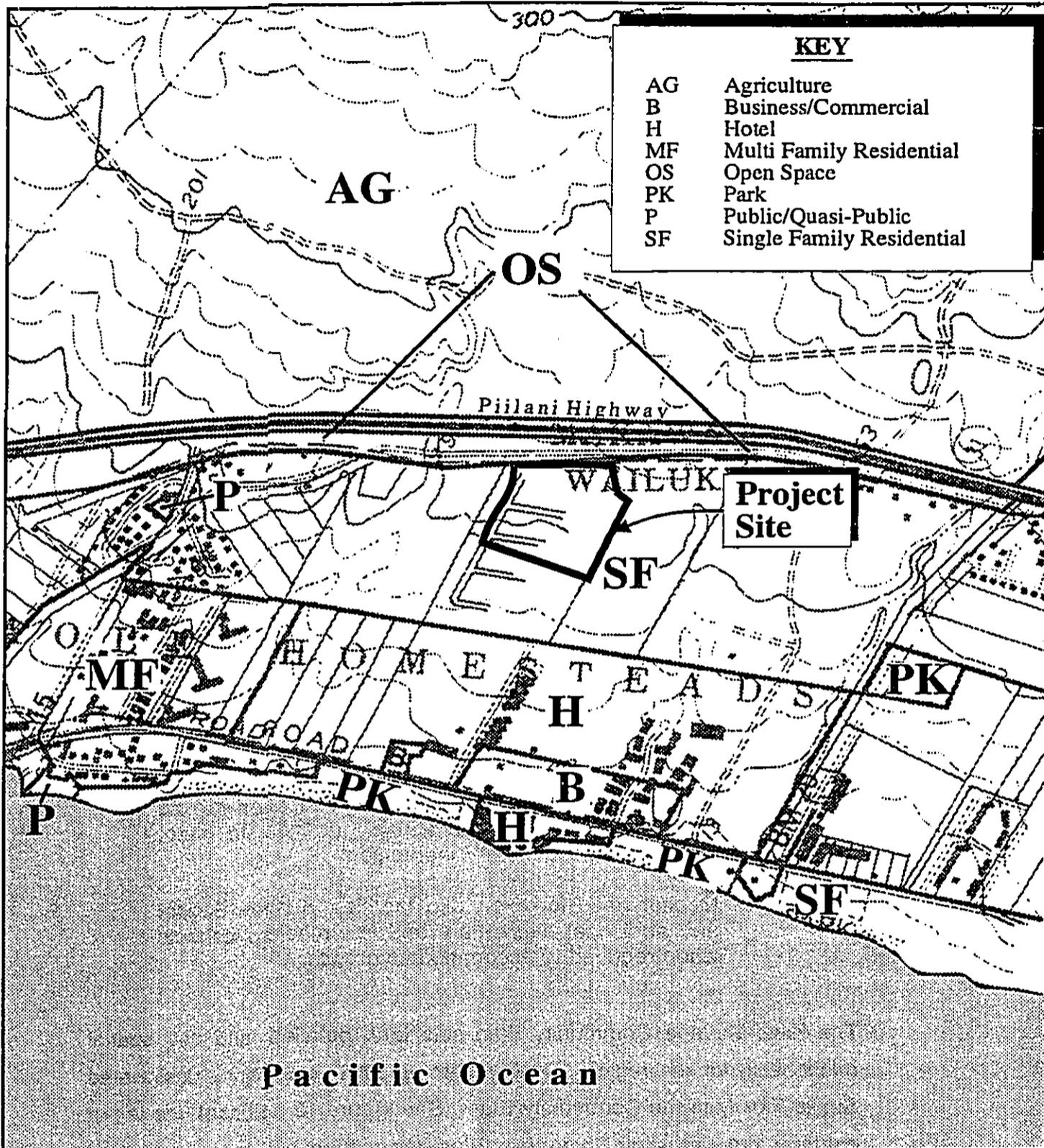


Figure 12 Kihei Elementary School II
 Kihei-Makena Community Plan
 Land Use Designations



Prepared for: Maui School Development Partnership

D. ZONING

The zoning for the site of the proposed Kihei Elementary School II is R-2 Residential District. Elementary schools are permitted within R-2 zoned properties. Accordingly, the proposed elementary school is consistent with County of Maui zoning provisions.

E. 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 Maui 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 recreational 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, fishponds and sand 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) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
- (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;
- (7) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and
- (8) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, county planning commissions, and crediting such dedication against the requirements of section 46-6.

Response: The proposed project is not anticipated to affect existing coastal recreational resources. The project is designed to accommodate current and projected needs for educational facilities. Accordingly, the project itself is not a direct generator of new demand for regional recreational resources.

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 areas that are significant in Hawaiian and American history and culture.

Policies:

- a. Identify and analyze significant archaeological resources;
- b. Maximize information retention through preservation of remains and artifacts or salvage operations; and
- c. Support State goals for protection, restoration, interpretation and display of historic resources.

Response: Although Site 2632 was originally interpreted to be a historic ranch site, additional information revealed that it was formerly utilized as a dwelling and was not engaged in ranching activities. It is anticipated that Site 2632 will be no longer considered significant in the context of historic preservation.

3. Scenic and Open Space Resources

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

Policies:

- a. Identify valued scenic resources in the coastal zone management area;
- b. 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;
- c. Preserve, maintain and, where desirable, improve and restore shoreline open space and scenic resources; and
- d. Encourage those developments which are not coastal dependent to locate in inland areas.

Response: The new school will be architecturally designed and landscaped to ensure visual compatibility with the surrounding environs. The development of the proposed school at this location is consistent with the objectives and policies for scenic and open space resources.

4. **Coastal Ecosystems**

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

Policies:

- a. Improve the technical basis for natural resource management;
- b. Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
- c. 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
- d. 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. Drainage improvements shall be engineered to ensure that coastal water quality impacts are mitigated. In this regard, 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:

- a. Concentrate coastal dependent development in appropriate areas;
- b. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as 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
- c. 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:
 - (1) Use of presently designated locations is not feasible,
 - (2) Adverse environmental effects are minimized; and
 - (3) The development is important to the State's economy.

Response: The proposed project is designed to provide additional educational facilities servicing the Kihei-Makena region and will not generate any adverse economic impacts.

6. **Coastal Hazards**

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

Policies:

- a. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

-
- b. Control development in areas subject to storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
 - c. Ensure that developments comply with requirements of the Federal Flood Insurance Program;
 - d. Prevent coastal flooding from inland projects; and
 - e. Develop a coastal point and nonpoint source pollution control program.

Response: The project site is located within Zone C, which is an area of minimal flooding. Storm runoff would be addressed through new onsite and offsite drainage improvements proposed for the school and the proposed Road "F". No significant adverse drainage impacts to downstream properties should result from the proposed project.

7. **Managing Development**

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

Policies:

- a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- b. Facilitate timely processing of application for development permits and resolve overlapping of conflicting permit requirements; and
- c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the 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 and public review are 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.

8. **Public Participation**

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

- a. Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program;
- b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and
- c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: The proposed project involves the construction of a new school facility which provides the venue for educational enhancement for elementary school age children as well as the general public.

This preserves the opportunity for public awareness, education and participation pertaining to significant resource attributes of the coastal zone.

9. **Beach Protection**

Objective: Protect beaches for public use and recreation.

Policies:

- a. Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;
- b. Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
- c. Minimize the construction of public erosion-protection structures seaward of the shoreline.

Response: The proposed project is located approximately 2,000 feet from the shoreline and is not anticipated to impact shoreline activities.

Chapter V

Summary of Adverse Environmental Effects Which Cannot Be Avoided

V. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The proposed development of Kihei Elementary School II will result in unavoidable construction-related impacts as described in Chapter III, Potential Impacts and Mitigation Measures.

Potential effects include noise-generated impacts occurring from site preparation and construction activities. In addition, there may be temporary air quality impacts associated with dust generated from construction activities, and exhaust emissions discharged by construction equipment.

The proposed project is not anticipated to create any significant, long-term, adverse environmental effects.

Chapter VI

Alternatives to Proposed Action

VI. ALTERNATIVES TO PROPOSED ACTION

Several alternatives were considered to address the long-range elementary school needs in the Kihei-Makena region.

A. EXPANSION OF KIHEI ELEMENTARY SCHOOL

Kihei Elementary School currently has an enrollment of approximately 1,128 students. In addition to 32 permanent classrooms, the existing school houses 23 portable classrooms.

A desirable enrollment for an elementary school is considered to be 800 students (R. M. Towill Corp., August, 1992). This enrollment level was determined to support the most effective range of activities, facilities and curriculum. Kihei Elementary School already exceeds the desirable enrollment figure of 800 students. Further expansion of the existing school would not provide for a desirable long-term solution to meet educational facility needs.

B. ALTERNATIVE LOCATIONS

A site selection study and Environmental Impact Statement were undertaken on behalf of the DOE to consider alternative locations for the new Kihei Elementary School (Comprehensive Consulting Services of Hawaii, September, 1991). Four (4) alternative sites were considered as follows (See Figure 13):

Site No. 1 (TMK 3-9-19:4): This site is located on Kananui Road north of the Keonekai Heights Subdivision.

Site No. 2 (TMK 3-9-19:Portion of 6): Site No. 2 is the site selected for the proposed Kihei Elementary School II.

Site No. 3 (TMK 2-1-8:42): This site is located west of Kapili Street between the Wailea Kialoa Subdivision and Kilohana Park.

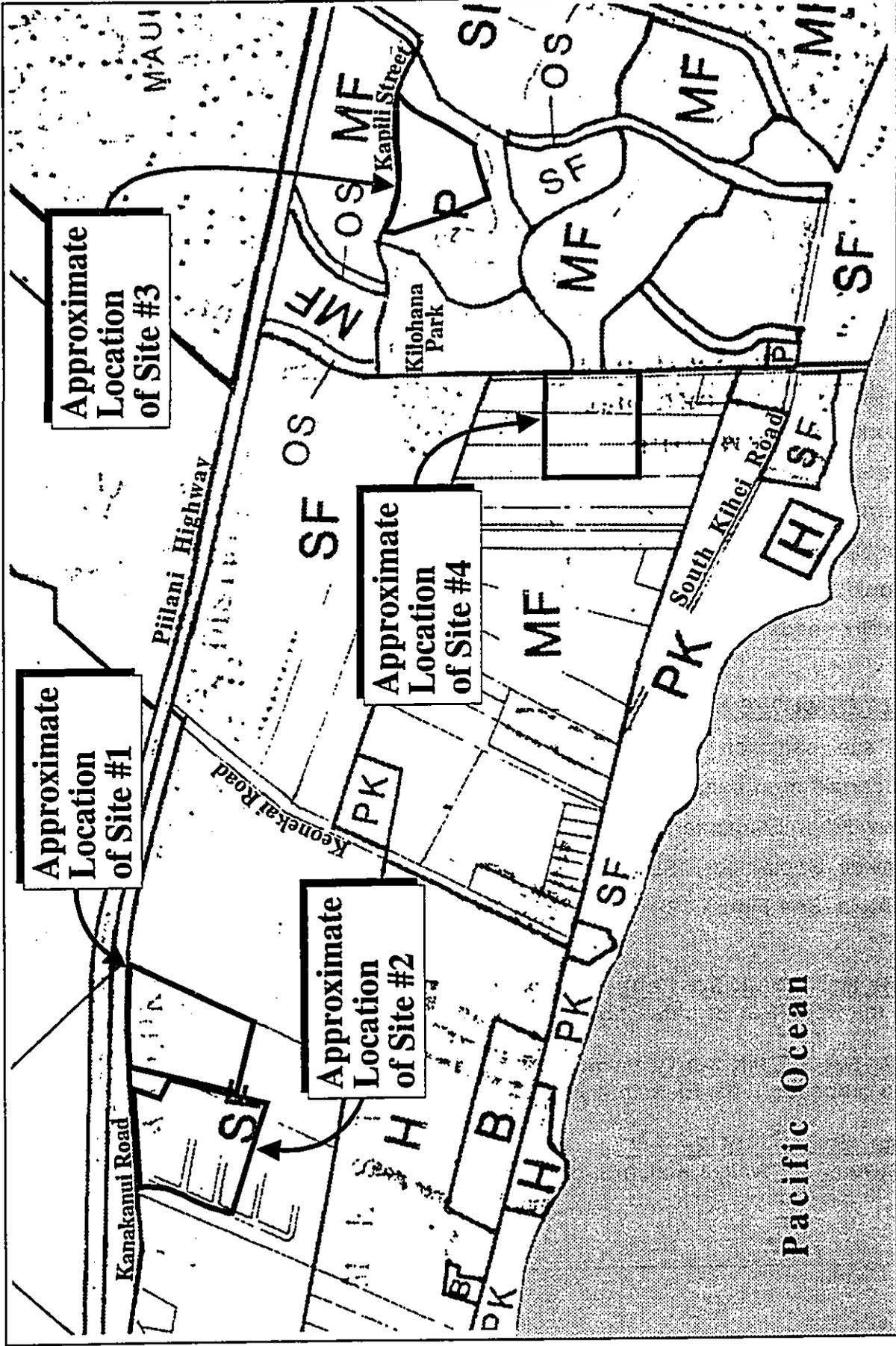
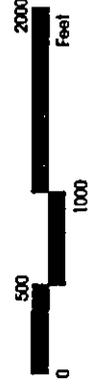


Figure 13

Kihei Elementary School II
Locations of Alternative School Sites



Prepared for: Maui School Development Partnership

Site No. 4 (TMK 3-9-4:Portion of 129): This site is located on Kilohana Drive between Kauhale Street and South Kihei Road, north of the Wailea Kai Subdivision.

The study considered and ranked the four (4) sites based on a total of 28 site criteria (e.g. location, size of the property, topography, access, proximity to infrastructure, cost of site development, environmental impacts, availability, and bussing cost). For each of the criteria, each site was ranked as "Good", "Fair" or "Poor". A ranking of "Good" equalled one (1) point while a ranking of "Fair" or "Poor" did not have a point total attached to it.

The study ranked Site No. 1 highest, with a score of 22.5. Site No. 3 was next with a score of 22. Site No. 2 was ranked next, with a score of 21.5. Site No. 4 had a score of 18.5. See Table 2.

Although Site No. 2 has been selected, it is noted that the ranking among Site Nos. 1, 2 and 3 are nearly equal.

Significantly, Site No. 2, the selected site, is readily available for school development based on the willingness of the current owner to cooperate with the DOE.

C. NO ACTION ALTERNATIVE

The existing Kihei Elementary School facility is currently operating at enrollment levels above the desirable enrollment figure of 800 students. Future growth and development in the region will only add to the overcrowding at the existing school. The no action alternative does not represent a responsible option in addressing elementary school educational needs in the region.

Table 2

SITE RATING SUMMARY FOR KIHEI ELEMENTARY SCHOOL SITE SELECTION				
Rated Factor	Site #1	Site #2	Site #3	Site #4
Location	Good	Good	Fair	Fair
Size	Good	Good	Good	Fair
Topography	Good	Good	Fair	Fair
Slope	Good	Good	Fair	Fair
Shape	Good	Good	Fair	Good
Vehicular Access	Good	Good	Good	Good
Walking Access	Fair/Good	Fair/Good	Good	Good
Traffic Accommodation	Good	Good	Good	Good
Planning & Zoning	Good	Good	Good	Good
Historical	Good	Good	Good	Good
Special Management Area	Good	Good	Good	Good
Flood Free	Good	Good	Good	Good/Fair
Drainage	Good	Good	Good	Fair
Tsunami Free	Good	Good	Good	Good
Geological Stability	Good	Good	Good	Good
Storm Drain Proximity	Fair	Fair/Poor	Good	Good
Water Service Proximity	Fair	Fair	Good	Good
Sewer Proximity	Fair	Fair	Fair	Good
Electricity	Good	Good	Good	Good
Telephone	Good	Good	Good	Good
Site Cost-Development	Fair	Fair/Poor	Good	Fair
Air Quality	Good	Good	Good	Good
Noise Free	Good	Good	Good	Good
Archaeology	Good	Good	Good	Good
Scenic Beauty	Fair	Fair	Good	Fair
Displacement	Good	Good	Good	Good
Availability	Good	Fair	Good	Poor
Bussing Cost	Good	Good	Fair	Fair
Total*	22.5	21.5	22	18.5
Source: Comprehensive Consulting Services of Hawaii.				
* Totals reflect the sum of all criteria rated "Good".				

Chapter VII

Irreversible and Irretrievable Commitments of Resources

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed project will result in the loss of approximately twelve (12) acres of land for the development of a second elementary school in Kihei. While the loss of this land is considered irretrievable, the projected need for additional educational services and facilities is considered essential.

No other significant irreversible and irretrievable commitments of resources have been identified in connection with the proposed action.

Chapter VIII

Findings and Conclusions

VIII. FINDINGS AND CONCLUSIONS

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

From a long term perspective, the proposed project is not anticipated to result in adverse environmental impacts. The project should not have a significant negative impact on botanical and wildlife resources in the vicinity.

A recent archaeological study was conducted for the project site. The survey identified one (1) site (Site 2632) within the limits of the subject property. This site was described as a historic ranch site in another earlier archaeological survey. However, a recent archaeological study indicates that this could have been a structure not necessarily associated with ranching activities. According to informant interviews with a native Hawaiian resident of Maui who visited the site, the structure was formerly utilized as a dwelling by some of his relatives. The informant also indicated that his relatives resided in the dwelling from the 1920's through World War II. It is anticipated that this site will be no longer considered significant in the context of historic preservation.

The project should have significant beneficial effects upon educational services in the Kihei-Makena region. The existing elementary school facility is already overcrowded and the need for the second elementary school facility is significant.

With the implementation of regional traffic improvements, as well as project-specific improvements, the proposed project is not anticipated to have any adverse impacts on traffic operations in the vicinity. Concrete drainage inlets will collect runoff from the project site. An onsite retention basin/playfield, with an emergency spillover, will store the runoff and convey it to the Road "F" drainage system. Drainage will be addressed by an underground drainage collection system, swales, and a retention basin/playfield located on the school site. The development of the school is not expected to result in any adverse impacts to adjacent and downstream properties. Soil loss during construction is below the allowable rate established by the County.

The project is also not anticipated to have adverse impacts upon medical, police, and fire protection services as well as other infrastructure systems.

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

Chapter IX

***Agencies and Organizations
Consulted in the Preparation of
the Environmental Assessment***

X. AGENCIES AND ORGANIZATIONS CONSULTED IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT

1. State of Hawaii
Department of Education-Maui District Office
Facilities and Grounds Division, 4th Floor
54 High Street
Wailuku, Hawaii 96793
2. State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
1325 Lower Main Street, Room 108
Wailuku, Hawaii 96793
3. County of Maui
Planning Department
250 South High Street
Wailuku, Hawaii 96793
4. Kihei Elementary School-PTSA
250 East Lipoa Street
Kihei, Hawaii 96753

Chapter X

***Letters Received After Filing of
Draft Environmental Assessment
and Agency Response***



'94 JUL 20 12:58

DEPT OF PLANNING
COUNTY OF MAUI
RECEIVED

July 15, 1994

Mr. Brian Miskae
Planning Director
County of Maui
Maui Planning Department
250 S. High Street
Wailuku, HI 96793

Dear Mr. Miskae:

Subject: Second Kihei Elementary School, SMA
TMK: 3-9-19:06

Thank you for allowing us to comment on the subject project.

In reviewing the information transmitted and our records, we have no objection to the subject project. A service request has been submitted for electrical service to MECO for a preliminary cost estimate. We encourage the developer's electrical consultant to meet with us as soon as practical and to submit a permanent service request for electrical service to verify the project's electrical requirements so that service can be provided on a timely basis.

If you have any questions or concerns, please call Dan Takahata at 871-2385.

Sincerely,

A handwritten signature in cursive script that reads "Edward L. Reinhardt".

Edward L. Reinhardt
Manager, Engineering

DT:rt



UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

70 S. HIGH STREET, RM. 215
WAILUKU, HAWAII
96793

Date: July 12, 1994

Mr. Brian Miskae, Planning Director
Maui Planning Department
250 S. High Street
Wailuku, Hawaii 96793

DEPT OF PLANNING
COUNTY OF MAUI
RECEIVED
94 JUL 13 13:08

Dear Brian,

RE: Second Kihei Elementary School; TMK: 3-9-19:06
I.D. No. 94/SM1-014

I have no comment on the subject's application and
environmental assessment.

Sincerely,
Neal S. Fujiwara
Neal S. Fujiwara
District Conservationist

MAUI PLANNING DEPT	FYI	COMMENTS
BRIAN	<input type="checkbox"/>	ASSIGN
GREEN	<input type="checkbox"/>	SEE ME
COLLEEN	<input type="checkbox"/>	FILE
CLAYTON	<input type="checkbox"/>	DRAFT RESPONSE
JACK	<input type="checkbox"/>	
B.	<input type="checkbox"/>	
SECRETARY	<input type="checkbox"/>	
ASSIGN TO		
ISSUE DATE		
DATE DUE		
BY:		

JOHN WAIHEE
GOVERNOR



ROBERT P. TAKUS
COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING
AND GENERAL SERVICES

SURVEY DIVISION
P. O. BOX 119
HONOLULU, HAWAII 96810

FILE NO. _____

July 8, 1994

TRANSMITTAL

TO: Mr. Brian Miskae, Director
ATTN.: Mr. Joseph Aleuta
SUBJECT: I. D. No. 94/SM1-014
TMK: 3-9-19:06
Project Name: Second kihei Elementary School
Applicant: Maui School Development Partnership

DEPT OF PLANNING
COUNTY OF MAUI
RECEIVED

94 JUL 11 P3:47

REMARKS:

The subject proposal has been reviewed and confirmed that no Government Survey Triangulation Stations and Benchmarks are affected. Survey has no objections to the proposed project.

STANLEY T. HASEGAWA
State Land Surveyor

MAUI
PLANNING
DEPT
BRIAN
GWEN
COLLEEN
CLAYTON
JULIE
BILL
SECRETARY

FYI
COMMENTS
ASSGN
SEE ME
FILE
DRAFT RESPONSE

ASSIGNED

TODAY'S DATE

7/11/94

DATE DUE

By: _____

JOHN WAIHEE
GOVERNOR



Dr. Herman Aizawa
SUPERINTENDENT

STATE OF HAWAII
OFFICE OF DISTRICT SUPERINTENDENT
DEPARTMENT OF EDUCATION
54 HIGH STREET, 4TH FLOOR, ROOM 401
WAILUKU, MAUI, HAWAII 96703

July 26, 1994

Mr. Edward L. Reinhardt
Manager, Engineering
Maui Electric Company, Ltd.
210 West Kamehameha Avenue
P. O. Box 398
Kahului, Hawaii 96732

SUBJECT: Second Kihei Elementary School
TMK 3-9-19:por.6

Dear Mr. Reinhardt:

We have received a copy of your July 15, 1994 letter to the County Planning Department regarding the subject project.

Please be advised that we will request that the developer's electrical consultant meet with you as soon as practicable to submit a permanent service request for electrical service.

Thank you for your timely comments.

Very truly yours,

Ralph M. Murakami

Ralph M. Murakami
District Superintendent

RMM:hf

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

References

References

Community Resources, Inc., Maui County Community Plan Update Program Socio-Economic Forecast Report, January, 1994.

Comprehensive Consulting Services of Hawaii, Site Selection Study and Draft Environmental Impact Statement-New Kihei Elementary School, Kihei, Maui, September, 1991.

Cultural Services Hawaii, Archaeological Reconnaissance of a 54-Acre Parcel at Kamaole, Wailuku District, Island of Maui, April, 1989.

First Hawaiian Bank, Supplement to Economic Indicators-Maui County Profiles, July/August, 1993.

Michael T. Munekiyo Consulting, Inc., Special Management Area Permit Application-Road "F"/Kamaole Heights, October, 1993.

R. M. Towill Corp., Public Facilities Assessment Report, August, 1992.

State of Hawaii, Department of Business, Economic Development, and Tourism, Data Book, March 1993.

Telephone conversation with Department of Education employee, Aileen Shirota, April, 1994.

Telephone conversation with Department of Education employee, David Keala, May, 1994.

Telephone conversations with Maui Fire Department employees, Joseph Fernandez and Cindy Kagoshima, April, 1994.

Telephone conversation with Maui Police Department employee, Greg Takahashi, April, 1994.

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

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

Wilson Okamoto and Associates, Site Selection Report and Draft Environmental Impact Statement for the Proposed Upcountry Maui High School, May, 1991.

Appendices

Appendix A

Botanical Study

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

by

Winona P. Char
CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

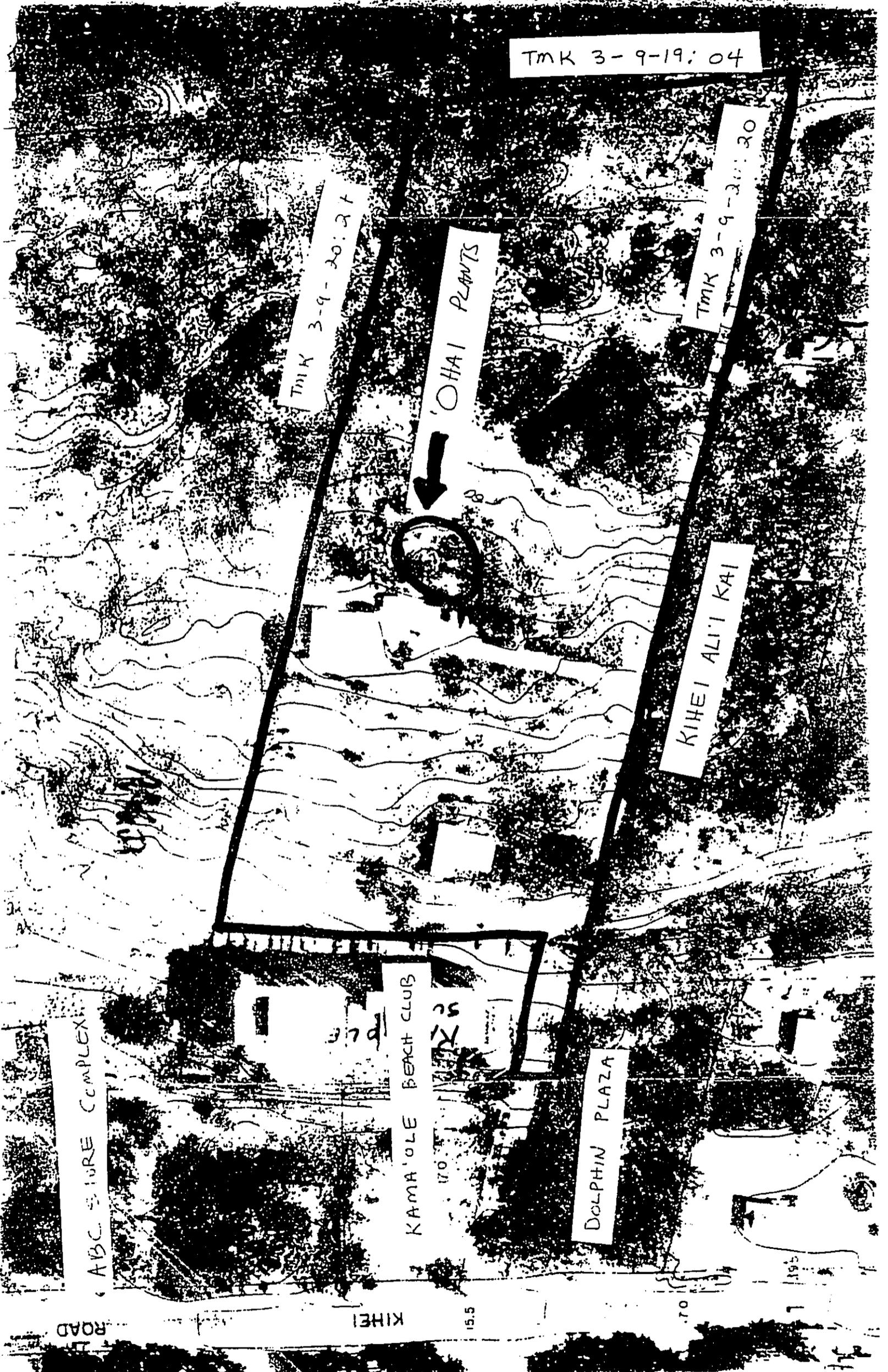
Prepared for: Michael T. Munekiyo Consulting, Inc.

August 1993

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ENDANGERED PLANTS	5
DISCUSSION AND RECOMMENDATIONS	6
PLANT SPECIES LIST	8
LITERATURE CITED	13

DOCUMENT CAPTURED AS RECEIVED



ROAD

KIHEI

15.5

170

195

ABC SHORE COMPLEX

KAMA'OLE BEACH CLUB

DOLPHIN PLAZA

KIHEI ALI'I KAI

OHAI PLANTS

TMK 3-9-30:27

TMK 3-9-30:30

TMK 3-9-19:04

Appendix B

***Clarification of
Status of Site 2632***

XAMANEK RESEARCHES
P.O. BOX 131
PUKALANI, MAUI, HAWAII 96788
Phone/FAX 572-8900

6 June 1994

Milton Arakawa
Munekiyo & Arakawa, Inc.
1823 Wells Street, Suite 3
Wailuku, Maui, Hawaii 96793

Subject: Kihei Elementary School II Project, clarification of status of Site 2632. as reported in "Archaeological Survey and Testing of a 54 -Acre Parcel at Kama'ole. Wailuku District, Island of Maui", Hammatt, 1992.

Among five sites reported and described in this report. Site 2632 was described as an Historic Ranch Site. Description of the site is quoted below (Hammatt. 1992. pp. 14-16):

"Located in the east central portion of the project area (Fig. 4) at 100' elevation. the most prominent features of this site are a large platform and associated dump (Figs. 7.8). The rectangular platform is 29 m. long north/south by 7.6 m. wide east/west and is constructed of an average of five courses of stacked large boulders to create a facing .6 m. high along the east, west and north sides. There is a large trash dump 30 m. SW of this platform which appears to date primarily from the 1930s to 1950s, but pot hunters may have removed evidence of earlier occupation. Trash in the immediate area, including a kerosene stove, water tank, water pipes, pipe railing, a child's wagon wheels, a welded barbecue, and roofing iron suggest that this site may have been a ranch field station or cattle loading area utilizing the platform as a cattle ramp. In the NW portion of the platform adjacent to an aloe patch, is a semicircular alignment of boulders which was thought to possibly demarcate a historic burial. Other remains of ranch life in the area are a rock wall .7 m. high constructed around a kiawe tree 9 m. east of the platform. the adjacent remains of a probable chicken coop, and a possible stone loading ramp to the NE."

From the description above and the kinds of recent artifacts on the surface, site 2632 could have been a house not necessarily associated with the ranch. In discussing the results of the archaeological fieldwork, Hammatt (1992, p. 43) suggests a semicircular construction at the site is thought to be a planting area for aloe and/or an ash deposit area. Either one of these features could be associated with standard residential houses in the Kihei region, and not necessarily with ranching activities.

Mr. Leslie Kuloloio, a native Hawaiian resident of Maui who visited the site, discussed the architectural remains with us during two vis-a-vis meetings and several telephone conversations (personal communications during May and June, 1994). He identified the house remains as the former home of the family of his brother-in-law, Thomas Kalepo Wallace, Jr. He stated that it was not a former ranch house, as described by Hammatt (1992, p. 14). To corroborate his argument, he provided the following information:

The house (Site 2632, Hammatt, 1992) is located on Homestead land, a parcel of c. 27 ac. It was owned by Thomas Kalepo Wallace, Sr. They lived in the house on the parcel from sometime in the 1920s through the Second World War. The house was built upon the stone platform which continues to mark its former location. The land (and house) was sold to a Canadian group between 1957 and 1960. The Canadian group sold the property to unknown buyers c. 1960.

Mr. Kuloloio was very helpful in this matter. He is willing to meet with us again if we require further information regarding the identity of Site 2632. From our point of view, Mr. Kuloloio has provided an adequate explanation for the existing site. We would concur with his explanation.

Thank you. If you have any questions, please contact us.

Sincerely,


Walter M. Fredericksen

Appendix C

Traffic Impact Analysis

DRAFT

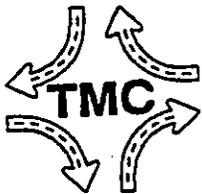
**TRAFFIC IMPACT ANALYSIS REPORT
FOR THE PROPOSED**

KIHEI ELEMENTARY SCHOOL II

PREPARED FOR
MURAYAMA, KOTAKE, NUNOKAWA & ASSOCIATES, INC.
JANUARY 5, 1994

RECEIVED
JAN 6 1994

Murayama, Kotake, Nunokawa
& Assoc., Inc.



PREPARED BY

THE TRAFFIC MANAGEMENT CONSULTANT

RANDALL S. OKANEKU, P. E., PRINCIPAL • 1188 BISHOP STREET, SUITE 1907 • HONOLULU, HAWAII 96813

DRAFT

JAN 5 1994

TRAFFIC IMPACT ANALYSIS REPORT FOR THE PROPOSED KIHEI ELEMENTARY SCHOOL II

I. Introduction

A. Purpose of Study

The purpose of this study is to identify and analyze the traffic impacts resulting from the proposed Kihei Elementary School II in Kihei, Maui, Hawaii. This study also presents alternative improvements that would mitigate the traffic impacts identified in this study. This report presents the findings and recommendations of the study.

B. Scope of the Study

1. Description of the proposed project.
2. Description of the study area and surrounding land uses.
3. Evaluation of existing roadway and traffic conditions.
4. Estimation of future traffic without the project.
5. Development of trip generation characteristics for the proposed project.
6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendation of improvements that would mitigate the traffic impacts identified in this study.

II. Project Description

A. Location and Access

The 12 acre project site, identified as Tax Map Key 3-9-19:06, is located on the southwest corner of the future intersection of Kananui Road and the proposed Road F. Figure 1 shows the vicinity map. Road F, as described in the County of Maui's Kihei Traffic Master Plan, would be constructed by others,

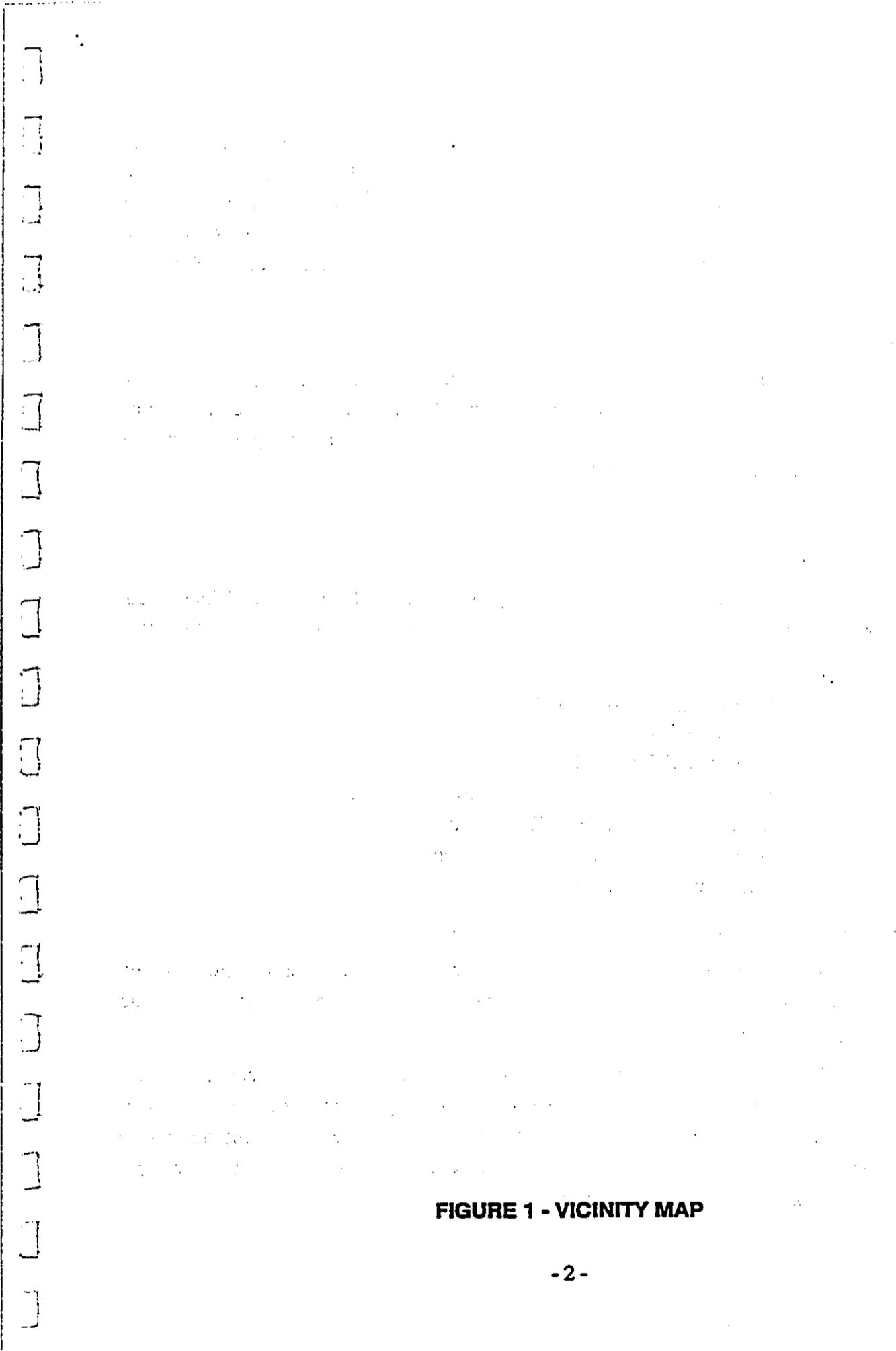


FIGURE 1 - VICINITY MAP

beginning at South Kihei Road near Kamaole Beach No. 1 and connecting to Piilani Highway, between Kanani Road and Keonekai Road. Primary access to the site is proposed on Kananui Road, about 230 feet south of its intersection with Road F. A service access driveway is proposed on the proposed Road F, located about 220 feet west of its intersection with Kananui Road. Figure 2 shows the project site plan.

B. Land Use Intensity

The Kihei Elementary School II is expected to be open in September, 1996. The Year 1996 is used as the planning horizon for the traffic impact analysis. For the purpose of the traffic impact analysis, the maximum elementary school enrollment is assumed to be 1,000 students.

III. Study Area Conditions

A. Study Area

The study area includes Piilani Highway, Kanani Road, South Kihei Road, Keonekai Road, and Kananui Road. The intersections included in this study are:

- Piilani Highway at Kanani Road
- Piilani Highway at Keonekai Road
- South Kihei Road at Kanani Road
- South Kihei Road at Keonekai Road
- Kanani Road at Auhana Road/Haukai Place
- South Kihei Road at Kamaole Beach No. 1
- Kananui Road at Alaku Place

B. Existing and Anticipated Future Development

The project site and the surrounding properties are currently undeveloped. Several residential projects are being planned or are under construction in the project vicinity.

Residential subdivisions with access on Alaku Place are currently under construction. Based upon discussions with real estate agents for these projects, about 170 single family dwelling units have been completed, are under construction, or are planned in the vicinity of Alaku Place. Full build out and occupancy are expected within the time frame of this study.

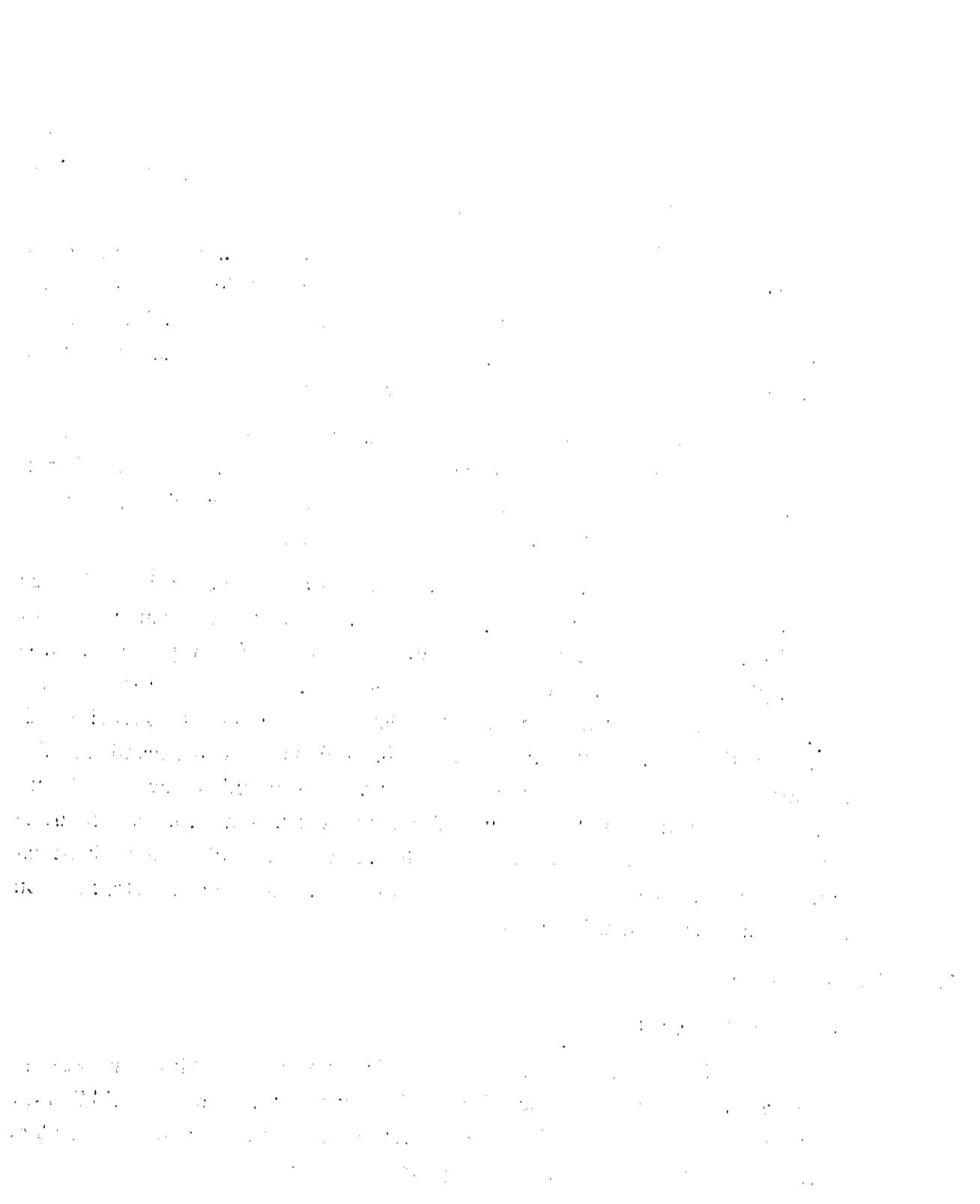


FIGURE 2 - PROJECT SITE PLAN

The Kamaole Homesteads Subdivision is a 98-lot residential project being planned immediately to the north of the project site. The development schedule for this project is uncertain at this writing.

The Kamaole Land Venture Hotel and Residential Complex was proposed on a 54 acre parcel on South Kihei Road, across from Kamaole Beach No. 1. The Kamaole Land Venture plans are being revised at this writing. The development of the Kamaole Homesteads Subdivision and the Kamaole Land Venture project are assumed to be beyond this study's planning horizon.

A 62-lot residential subdivision is proposed immediately to the west (makai) of the school site. The 62-lot subdivision is expected to be completed within the time frame of this study. As part of the development of this subdivision, a portion of Road F would be constructed to provide project access.

Road F is proposed as a major collector roadway between Piilani Highway and South Kihei Road, in the County's Kihei Traffic Master Plan. The purpose of Road F was to provide additional access between Piilani Highway and the existing and planned resort area in Kamaole. Road F is expected divert some of the existing and future traffic demands from Kanani Road and Keonekai Road. Within the time frame of this study, "half" of Road F is to be constructed. Road F envisioned as a two way, two lane roadway connecting Piilani Highway and South Kihei Road. Ultimately, Road F would become a multi-lane collector roadway between Piilani Highway and South Kihei Road. Road F could eventually be extended in the mauka (east) direction to provide access to future development on the mauka side of Piilani Highway.

IV. Existing Conditions

A. Area Roadway System

Piilani Highway is a two lane, two way high quality arterial highway between the Maalaea area and the Wailea Resort. Within the study area, Piilani Highway is unsignalized at its intersections with Kanani Road and Keonekai Road. Piilani Highway is the primary arterial highway for South Maui.

South Kihei Road is a secondary arterial highway, between its junction with Mokulele Highway to the north and Wailea to the south. South Kihei Road is a two lane roadway in the vicinity of the project. Within the study area, South Kihei Road is unsignalized at its intersections with Kanani Road and Keonekai Road.

Kanani Road is a two lane, two way collector between Piilani Highway and South Kihei Road, located to the north of the project site. Makai bound Kanani Road is stop-controlled at Auhana Road/Haukai Place. Kanani Road continues in the makai direction intersecting South Kihei Road, opposite Ili Ili Street.

Keonekai Road is located to the south of the project site. Keonekai Road is a two lane, two way collector roadway between Piilani Highway and South Kihei Road. Kananui Road intersects Keonekai Road, immediately west of Piilani Highway.

Kananui Road is a narrow, two way roadway in the vicinity of the project. Kananui Road connects Keonekai Road to the south and continues as Auhana Road as it approaches Kanani Road to the north. A major drainage ditch crosses over Kananui Road, between Keonekai Road and Alaku Place. A portion of Kananui Road is subject to flooding during severe rainstorms.

B. Existing Traffic Volumes and Operating Conditions

1. General

a. Field Investigation

A manual traffic count survey was conducted in the project vicinity in September, 1993, during the school peak periods of traffic between the hours of 6:00 AM to 8:30 AM, and 1:00 PM to 3:00 PM. The traditional PM peak period (3:00 PM to 6:00 PM) was not included in this analysis, since the elementary school is not expected to significantly impact the evening peak hour traffic. Additional traffic count data were obtained from the State Department of Transportation and other studies conducted in the vicinity.

b. Capacity Analysis Methodology

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

Level of Service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream." Several factors are included in determining LOS such as: speed, delay, vehicle density, freedom to maneuver, traffic interruptions, driver comfort, and safety. LOS "A", "B", and "C" are considered satisfactory levels of service. LOS "D" is generally considered a "desirable minimum" operating level of service. LOS "E" is an undesirable condition and LOS "F" is an unacceptable condition.

"Volume-to-capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road's traffic carrying ability. A v/c ratio of 0.50 indicates that the traffic demand is utilizing 50% of the roadway's capacity.

Another level of analysis for signalized intersections, relating traffic volumes to intersection capacity, is presented in the HCM as the "planning analysis" method. The purpose of this analysis is to determine the adequacy of intersection geometrics, i.e., number of through and turning lanes required, under given traffic demands. Three categories are used: "under capacity", "near capacity", and "over capacity". Under capacity conditions indicate that critical traffic volumes would virtually always be below the intersection's capacity. Over capacity conditions indicate that the intersection capacity will be exceeded in most cases and the intersection would require geometric improvements. Near capacity conditions requires engineering judgment as to whether or not intersection improvements would be required, especially when critical traffic volumes approach over capacity conditions. The planning method is a broad measure of traffic operations at an intersection, where the details of the traffic signal design and operation, intersection geometrics, and vehicle type distribution of traffic are not available.

2. AM Peak Hour Traffic Analysis

The AM peak hour of traffic in the vicinity of the project occurs between 7:00 AM and 8:00 AM. The left turn movements from Kanani Road and from Keonekai Road to northbound Piilani Highway operate at LOS "F" during the AM peak hour. Piilani Highway, north of Kanani Road, operates at LOS "E". South of Keonekai Road, Piilani Highway operates at LOS "D" during the AM peak hour. South Kihei Road operates at LOS "D" within study area. Figures 3 and 4 show the existing AM peak hour traffic volumes and operating LOS, along Kanani and Keonekai Roads, respectively. The remaining intersections in the study area operate at satisfactory Levels of Service during the AM peak hour, i.e., LOS "C" or better.

3. Mid-Afternoon Peak Hour Traffic Analysis

The mid-afternoon peak hour of traffic occurs between 1:45 PM and 2:45 PM. The left turn movements from Kanani Road and from Keonekai Road to northbound Piilani Highway continue to operate at LOS "F" during the mid-afternoon peak hour. Piilani Highway operates at LOS "D" within the study area. South Kihei Road, north of Kanani Road, operates at LOS "E". South of Keonekai Road, South Kihei Road operates at LOS "D" during the mid-afternoon peak hour. Figures 5 and 6 show the existing mid-afternoon peak hour traffic volumes and operating LOS, along Kanani Road and Keonekai Road, respectively. The remaining intersections in the study area operate at satisfactory Levels of Service during the mid-afternoon peak hour.

V. Projected Traffic

A. Site Traffic

1. Trip Generation

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

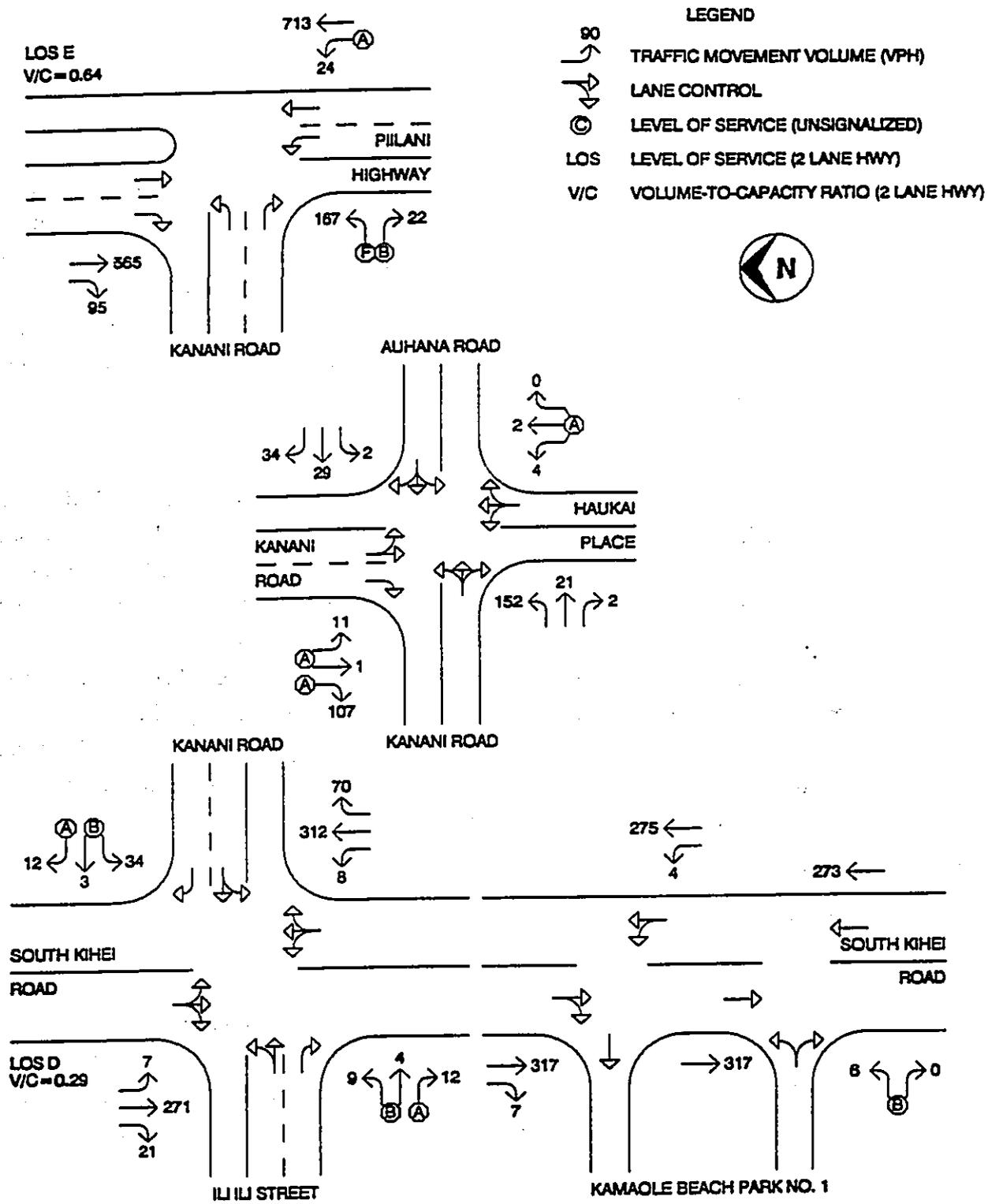


FIGURE 3 - EXISTING AM PEAK HR TRAFFIC-KANANI RD

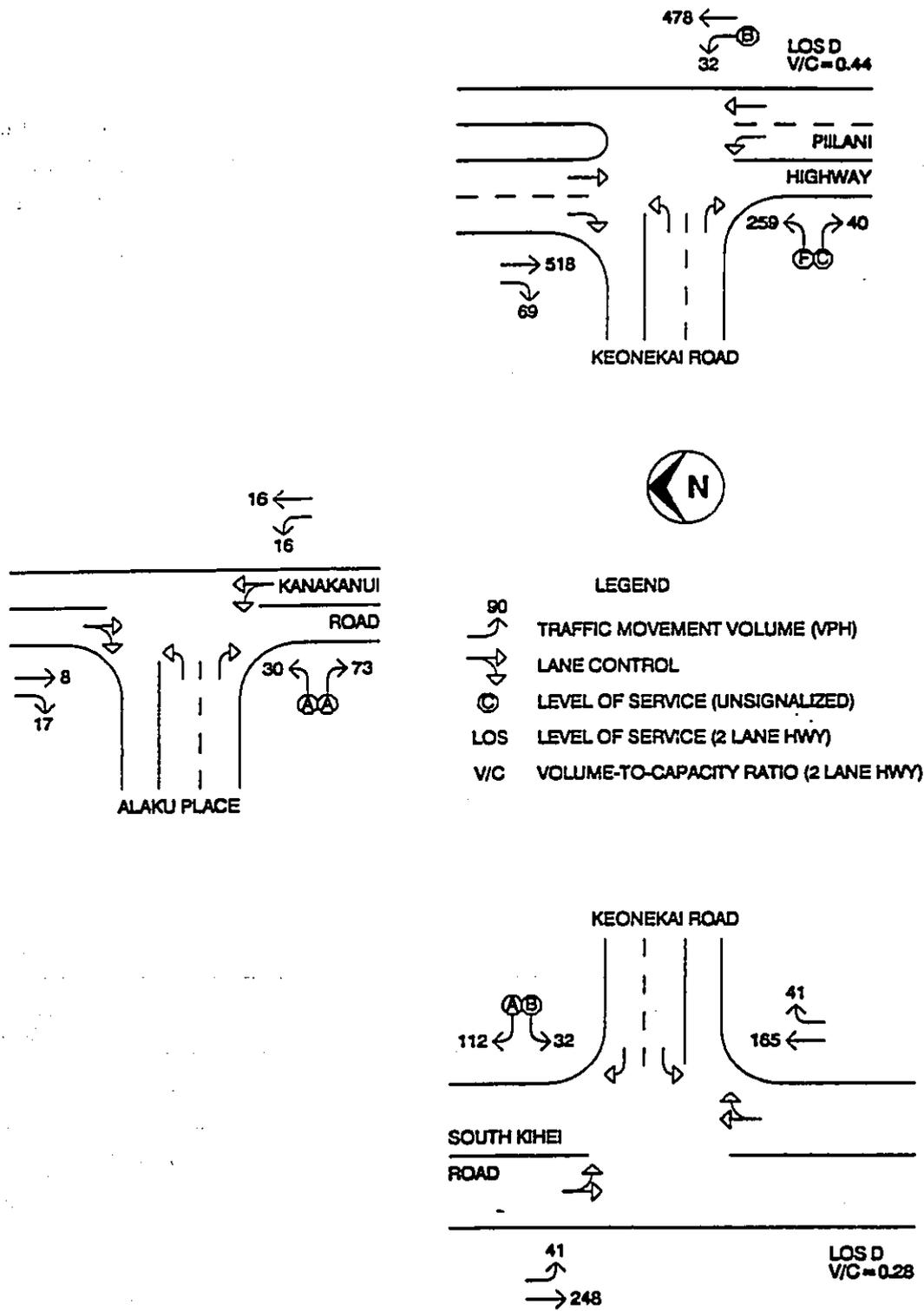


FIGURE 4 - EXISTING AM PEAK HR TRAFFIC-KEONEKAI RD

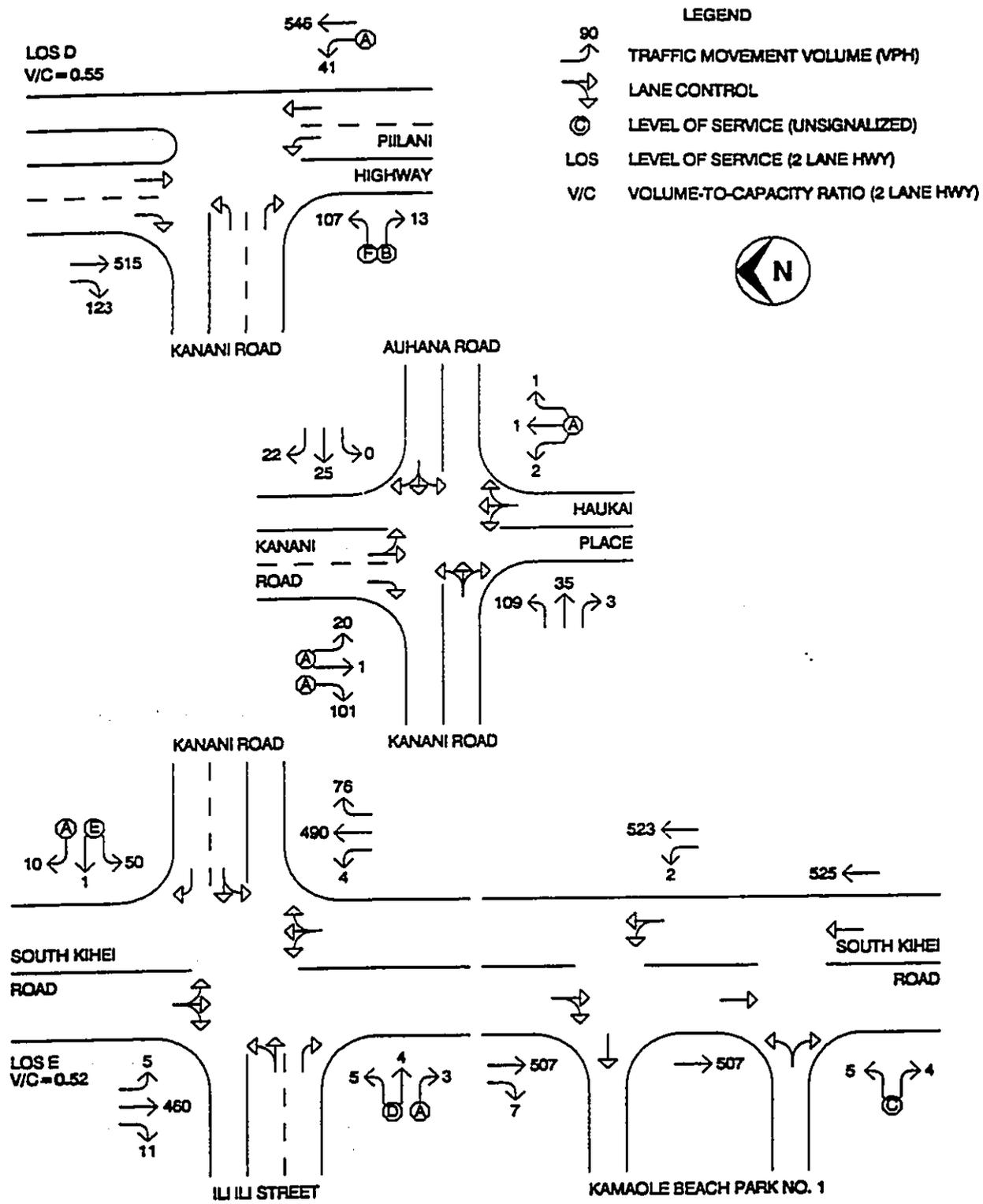
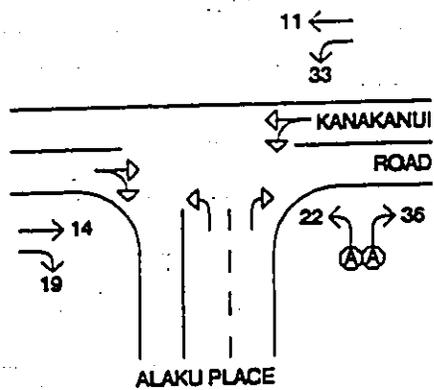
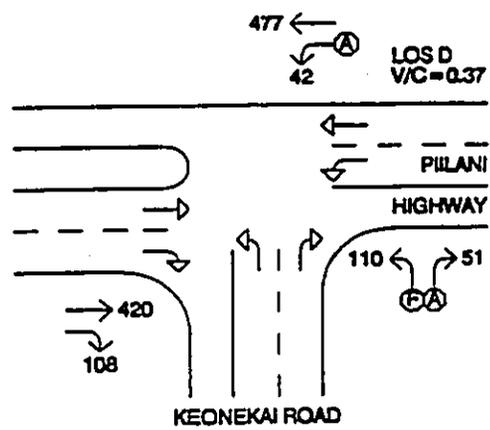


FIGURE 5 - EXISTING MID PM PEAK HR TRAFFIC-KANANI RD



LEGEND

- 90 ↗ TRAFFIC MOVEMENT VOLUME (VPH)
- ↗ LANE CONTROL
- ⊙ LEVEL OF SERVICE (UN SIGNALIZED)
- LOS LEVEL OF SERVICE (2 LANE HWY)
- V/C VOLUME-TO-CAPACITY RATIO (2 LANE HWY)

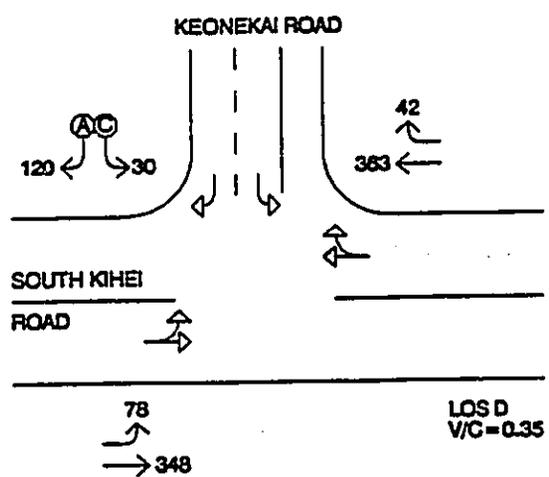


FIGURE 6 - EXISTING MID PM PEAK HR TRAFFIC-KEONEKAI RD

Based upon a maximum enrollment of 1,000 students, the proposed elementary school is expected to generate a total of 246 vehicles per hour (vph) during the AM peak hour of generator, 148 vph entering the site and 98 vph exiting the site. During the mid-afternoon peak hour, the proposed project is expected to generate 210 vph, 118 vph entering the site and 92 vph exiting the site. The proposed elementary school is expected to generate only 10 vph during the PM (evening) peak hour of adjacent street traffic. The evening peak hour traffic, generated by the proposed project, is not considered significant and is not analyzed in this study. Table 1 shows a summary of the trip generation characteristics.

Table 1. Trip Generation Characteristics				
Land Use: Elementary School		ITE Avg Trip Rate	Adjusted Trip Rate	Vehicle Trips
Independent Variable: 1,000 Students				
AM Peak Hour of Generator	Enter	60%	0.148	148
	Exit	40%	0.098	98
	Total	0.246	0.246	246
PM Peak Hour of Generator (Mid-Afternoon)	Enter	56%	0.118	118
	Exit	44%	0.092	92
	Total	0.210	0.210	210
PM Peak Hour of Adjacent Street Traffic	Enter	40%	0.004	4
	Exit	60%	0.006	6
	Total	0.010	0.010	10

B. External Traffic

1. Projected Through Traffic

Historical traffic count data were obtained from the State DOT. Linear regression techniques were applied to the historical traffic count data to estimate the annual growth in traffic. Traffic on Pilihi Highway has increased at an annual rate of 6.66%. The increase in traffic on South Kihei Road varies

from 4.55% per year, to the north of the study area and 0.42%, to the south of the study area. The historic growth in traffic is extrapolated from the base Year 1993 to the projected Year 1996 peak hour traffic conditions.

2. Future Off-Site Traffic In Study Area

The former Kamaole Land Venture project and the Kamaole Homestead Subdivision are assumed to be built out and occupied beyond the Year 1996 and are not included in this analysis.

The 62-lot residential subdivision, immediately to the south of the proposed school is expected to be built and occupied within this study's planning horizon. Road F is also expected to be constructed between South Kihei Road and Piilani Highway.

The residential developments with access on Alaku Place are expected to be built-out and occupied within the time frame of this study. Upon completion of Road F, it is expected that the Alaku Place residents would use Road F as their primary access to Piilani Highway and South Kihei Road. The traffic generated from these projects are added to the Year 1996 through traffic.

C. Total Traffic Volumes Without Project

The purpose of the traffic analysis of the Year 1996 traffic conditions without project is to establish base line conditions from which to measure the traffic impacts of the proposed elementary school. The Year 1996 traffic conditions without project is analyzed, assuming that Road F is constructed.

During the Year 1996 AM peak hour without project, the left turn movement from mauka bound Road F to northbound Piilani Highway is expected to operate at LOS "F" under unsignalized conditions. Similarly, the left turn movements from Keonekai Road and from Kanani Road to Piilani Highway are also expected to operate at LOS "F". During the Year 1996 AM peak hour without project, the operating Levels of Service on Piilani Highway and South Kihei Road are expected to remain the same as during existing AM peak hour. The remaining intersections in the study area operate at satisfactory Levels of Service during the AM peak hour without project. Figures 7, 8, and 9 show the Year 1996 AM peak hour traffic without the proposed project.

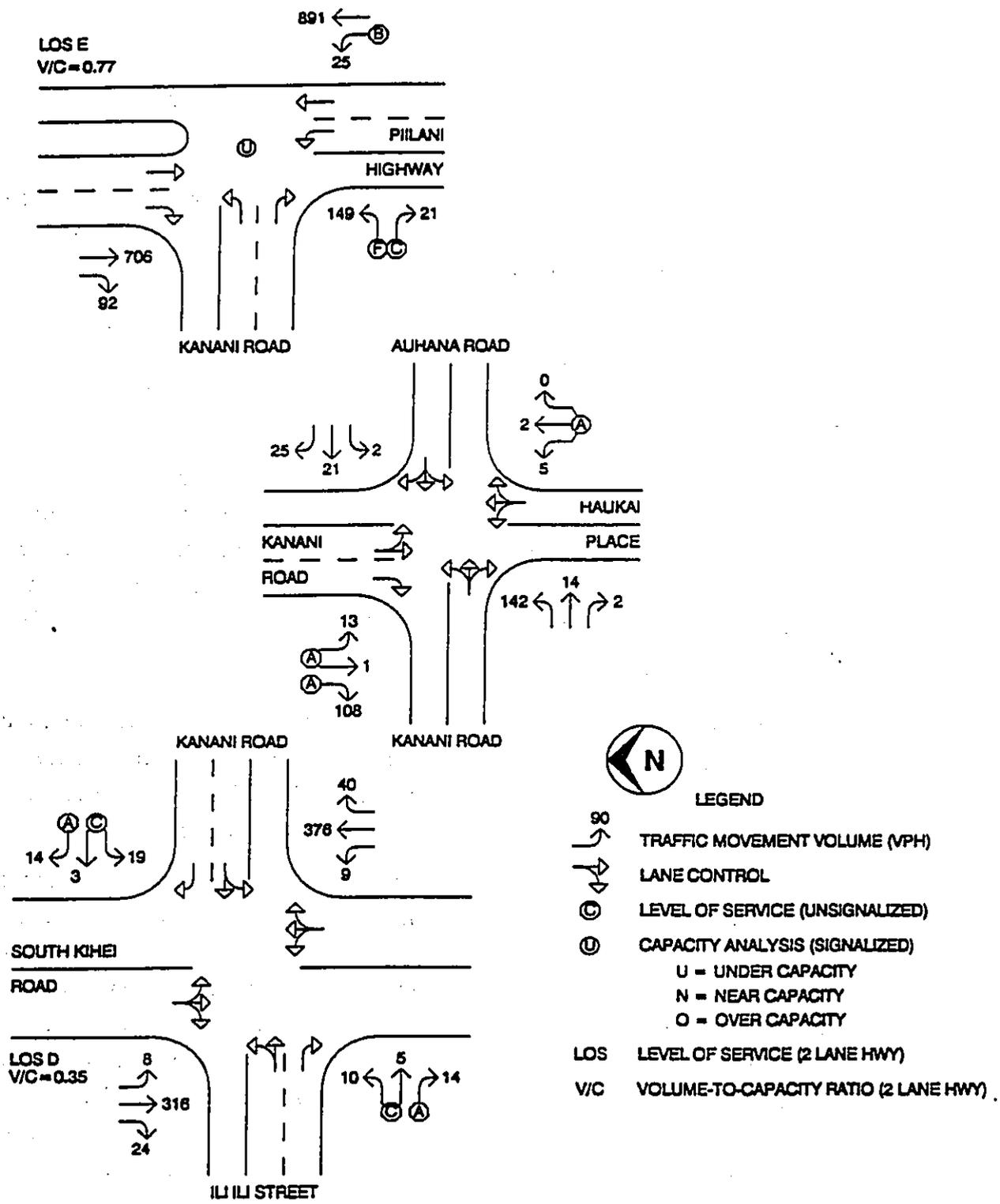
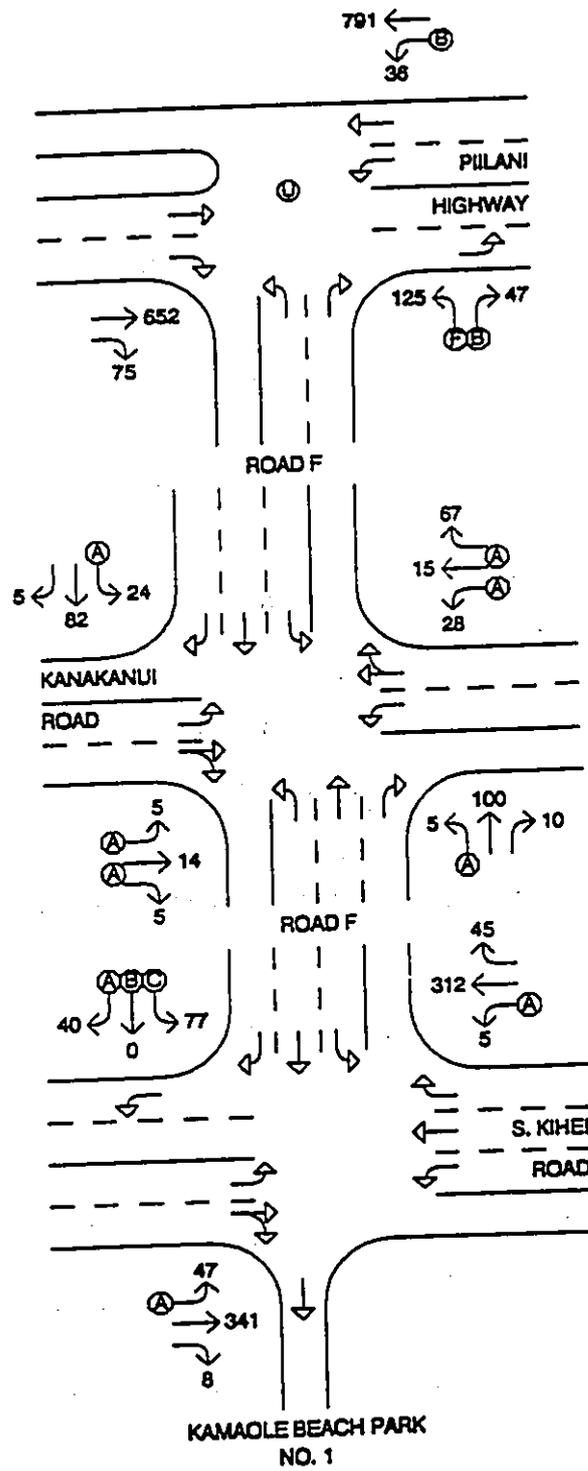


FIGURE 7 - AM PEAK HR TRAFFIC W/O PROJECT-KANANI RD



- LEGEND
- TRAFFIC MOVEMENT VOLUME (VPH)
 LANE CONTROL
 LEVEL OF SERVICE (UNSIGNALIZED)
 CAPACITY ANALYSIS (SIGNALIZED)
 U = UNDER CAPACITY
 N = NEAR CAPACITY
 O = OVER CAPACITY
 LOS LEVEL OF SERVICE (2 LANE HWY)
 V/C VOLUME-TO-CAPACITY RATIO (2 LANE HWY)

FIGURE 8 - AM PEAK HR TRAFFIC W/O PROJECT-ROAD F

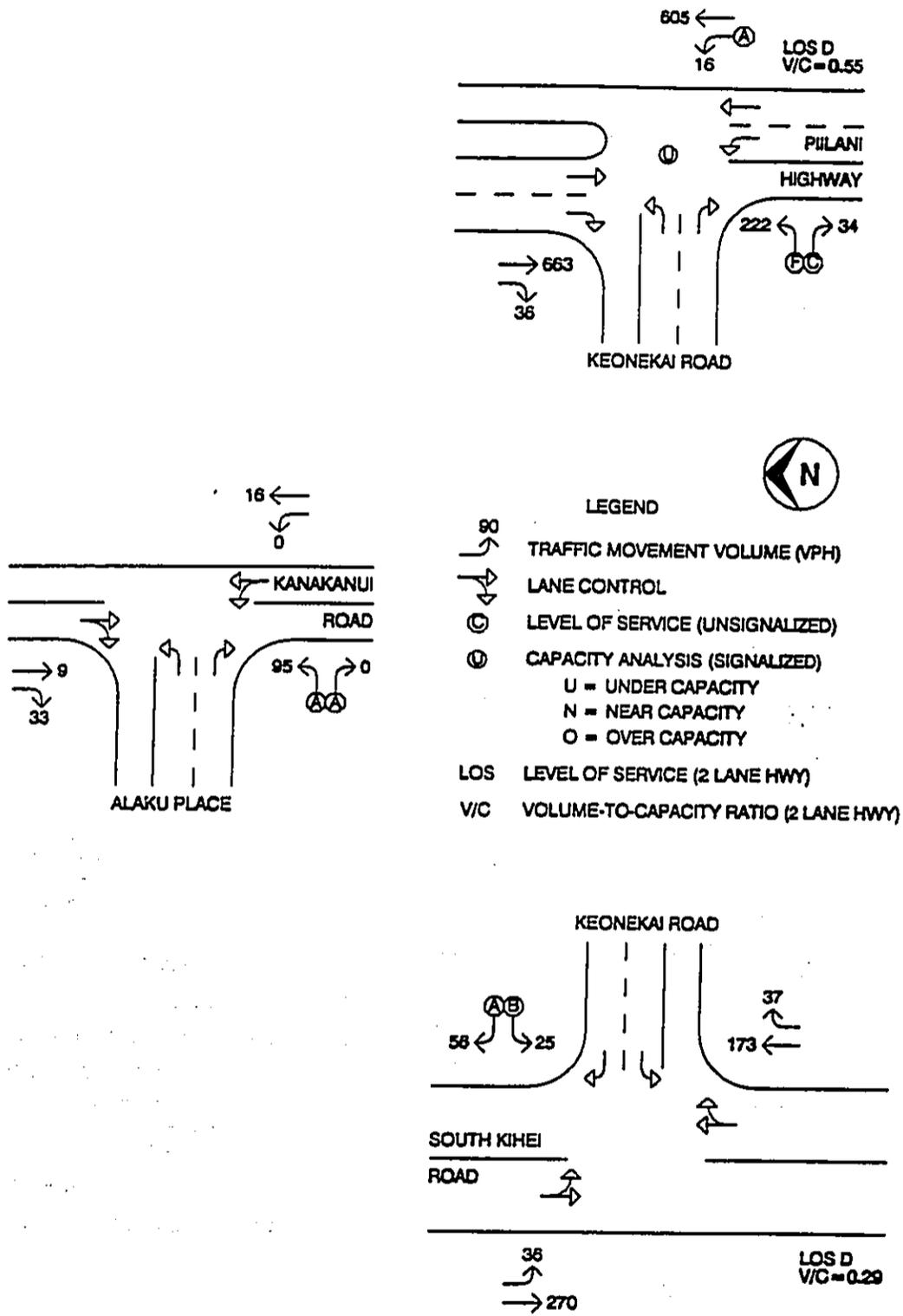


FIGURE 9 - AM PEAK HR TRAFFIC W/O PROJECT-KEONEKAI RD

Under unsignalized conditions, the left turn movement from mauka bound Road F to northbound Piilani Highway is expected to continue to operate at LOS "F", during the Year 1996 mid-afternoon peak hour without project. The left turn movement from makai bound Road F to southbound South Kihei Road expected to operate at LOS "E". The left turn movements from Kanani Road and from Keonekai Road to Piilani Highway are also expected to continue to operate at LOS "F". Piilani Highway, north of Kanani Road, is expected to operate at LOS "E". During the Year 1996 mid-afternoon peak hour, South Kihei Road is expected to operate at the same LOS as during the existing mid-afternoon peak hour. The remaining intersections in the study area operate at satisfactory Levels of Service during the mid-afternoon peak hour without project. Figures 10, 11, and 12 show the Year 1996 mid-afternoon peak hour traffic without the proposed project.

D. Total Traffic With Project

The site-generated traffic is superimposed over the Year 1996 traffic conditions without project. The traffic impact analysis is discussed in the following section.

VI. Traffic Impact Analysis

A. AM Peak Hour With Project

During the AM peak hour with project, the left turn movement, from makai bound Road F to southbound South Kihei Road, is expected to operate at LOS "D". The AM peak hour traffic operations within the rest of the study area are not expected to be significantly affected by the traffic generated by the proposed project. Figures 13, 14, and 15 show the AM peak hour traffic with the proposed project.

B. Mid-Afternoon Peak Hour With Project

The traffic operations during the mid-afternoon peak hour of traffic with project are not expected to be significantly impacted by the site-generated traffic. Figures 16, 17, and 18 show the mid-afternoon peak hour traffic with the proposed project.

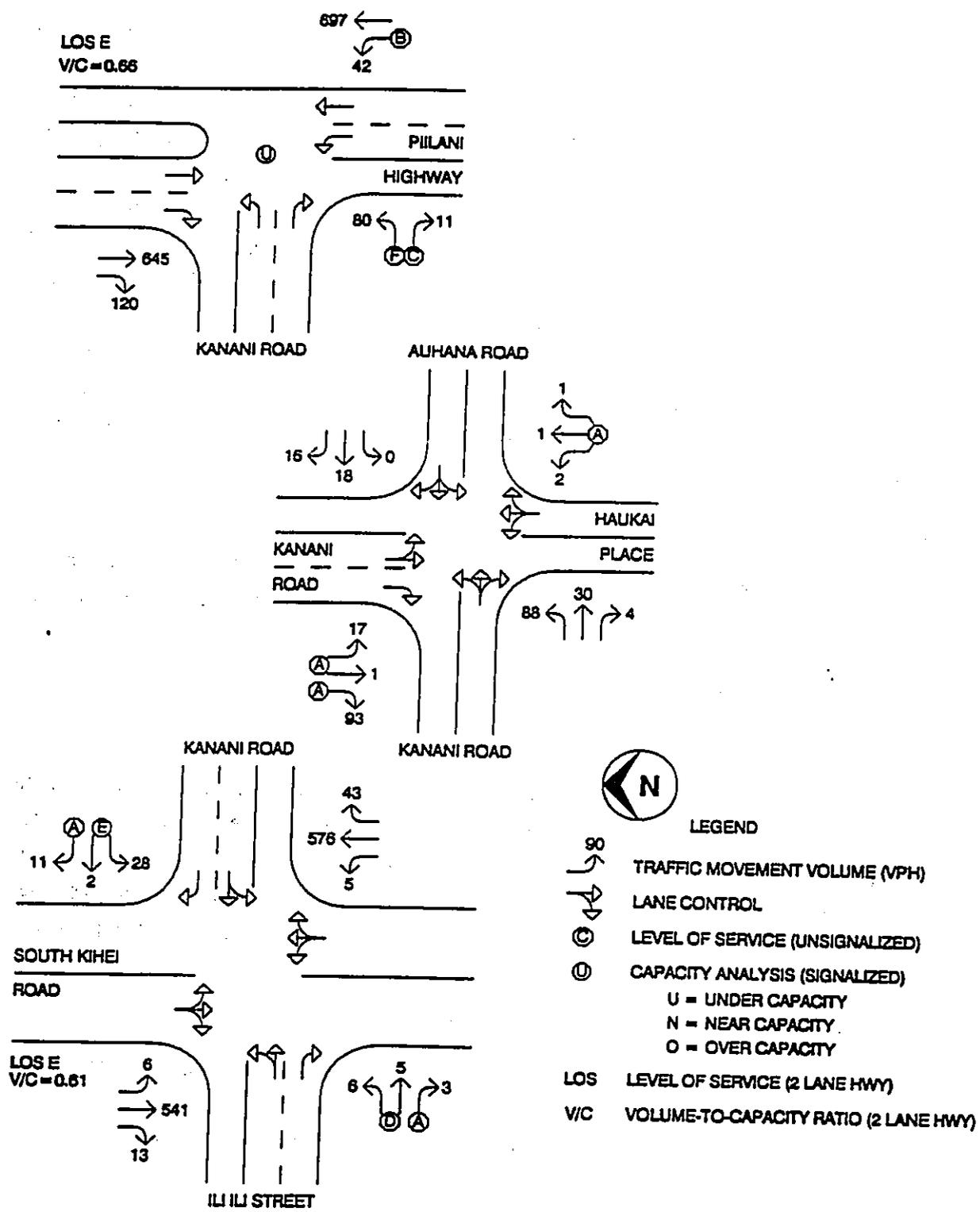


FIGURE 10 - MID PM PEAK HR TRAFFIC W/O PROJECT-KANANI RD

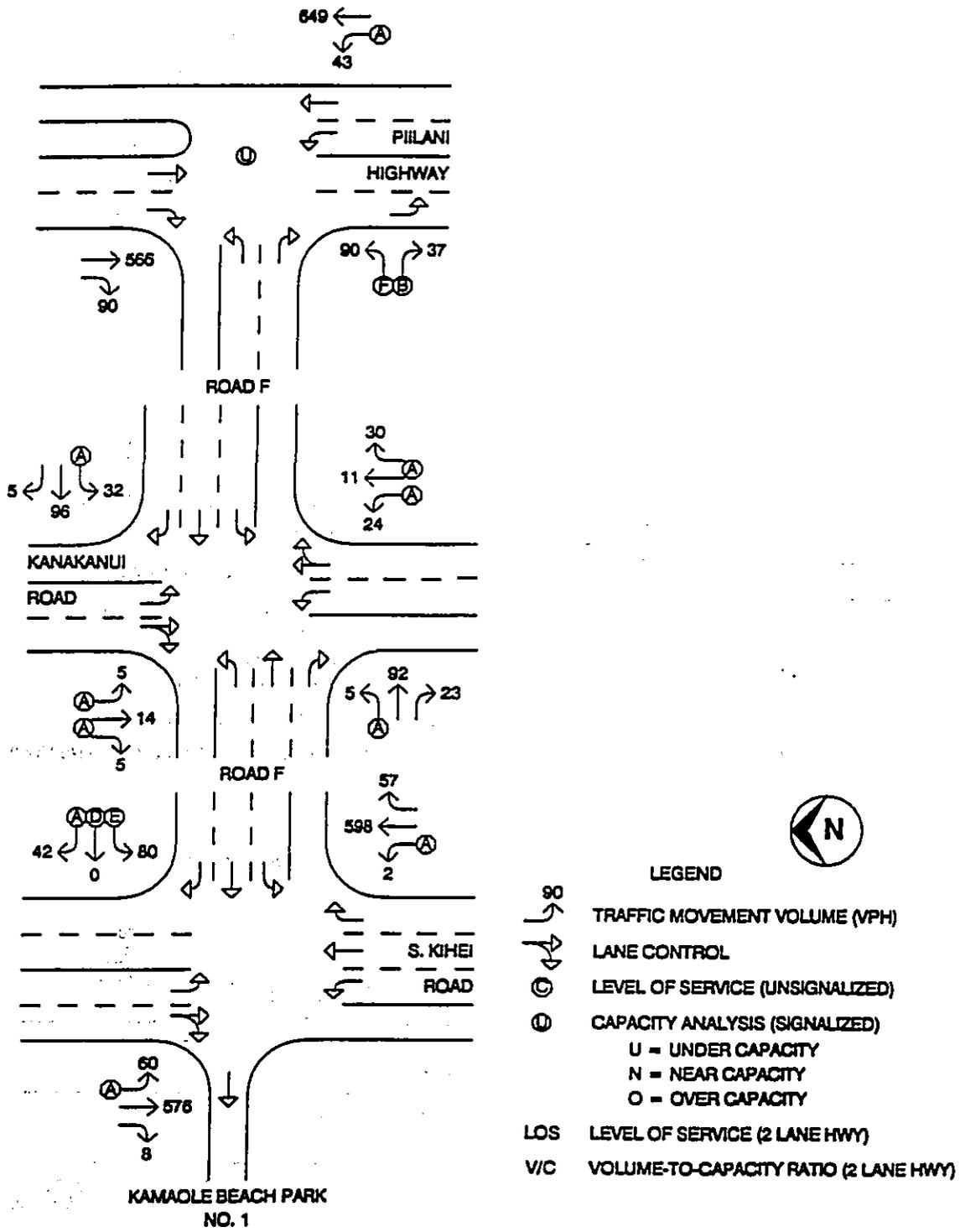


FIGURE 11 - MID PM PEAK HR TRAFFIC W/O PROJECT-ROAD F

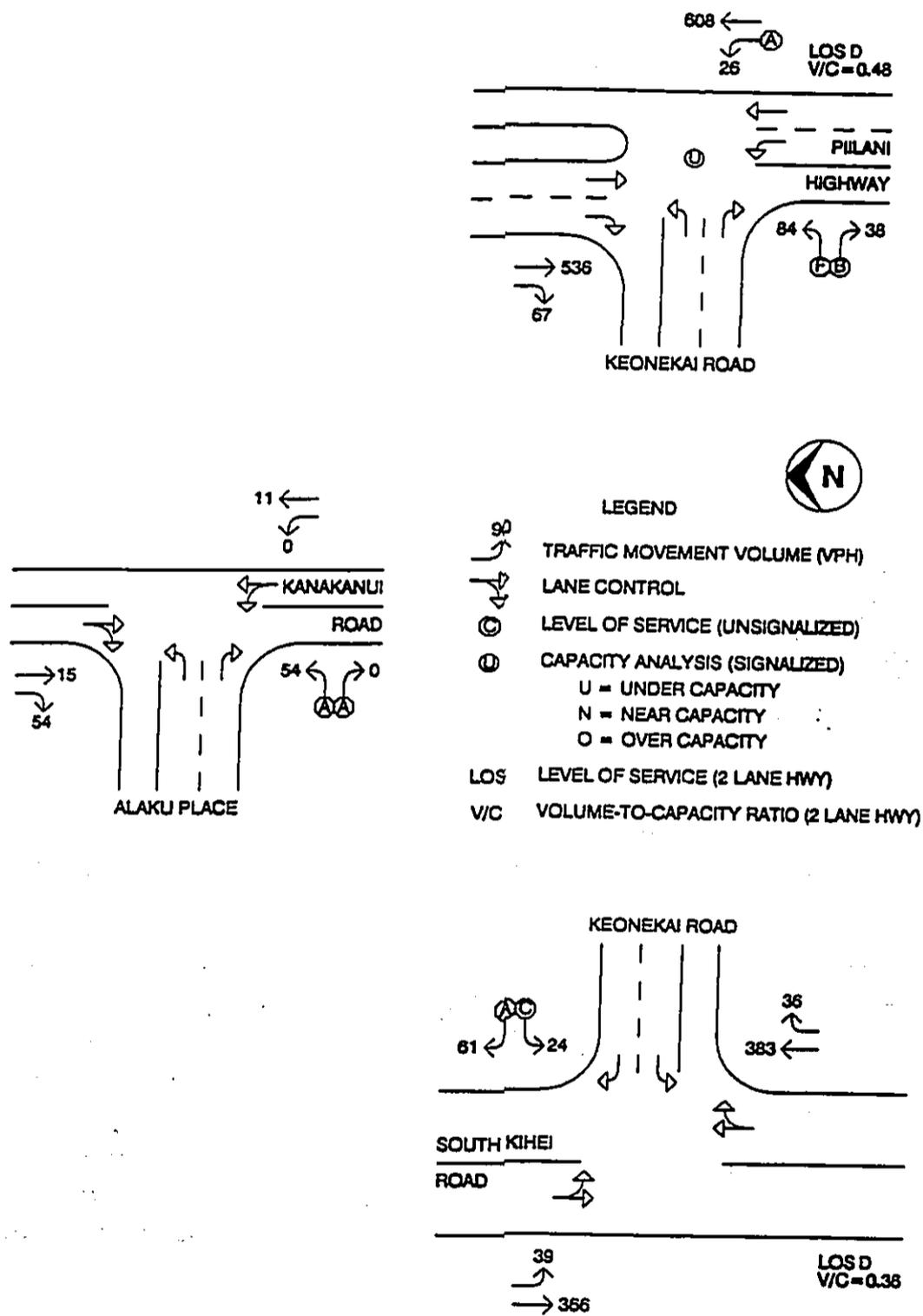


FIGURE 12 - MID PM PEAK HR TRAFFIC W/O PROJECT-KEONEKAI RD

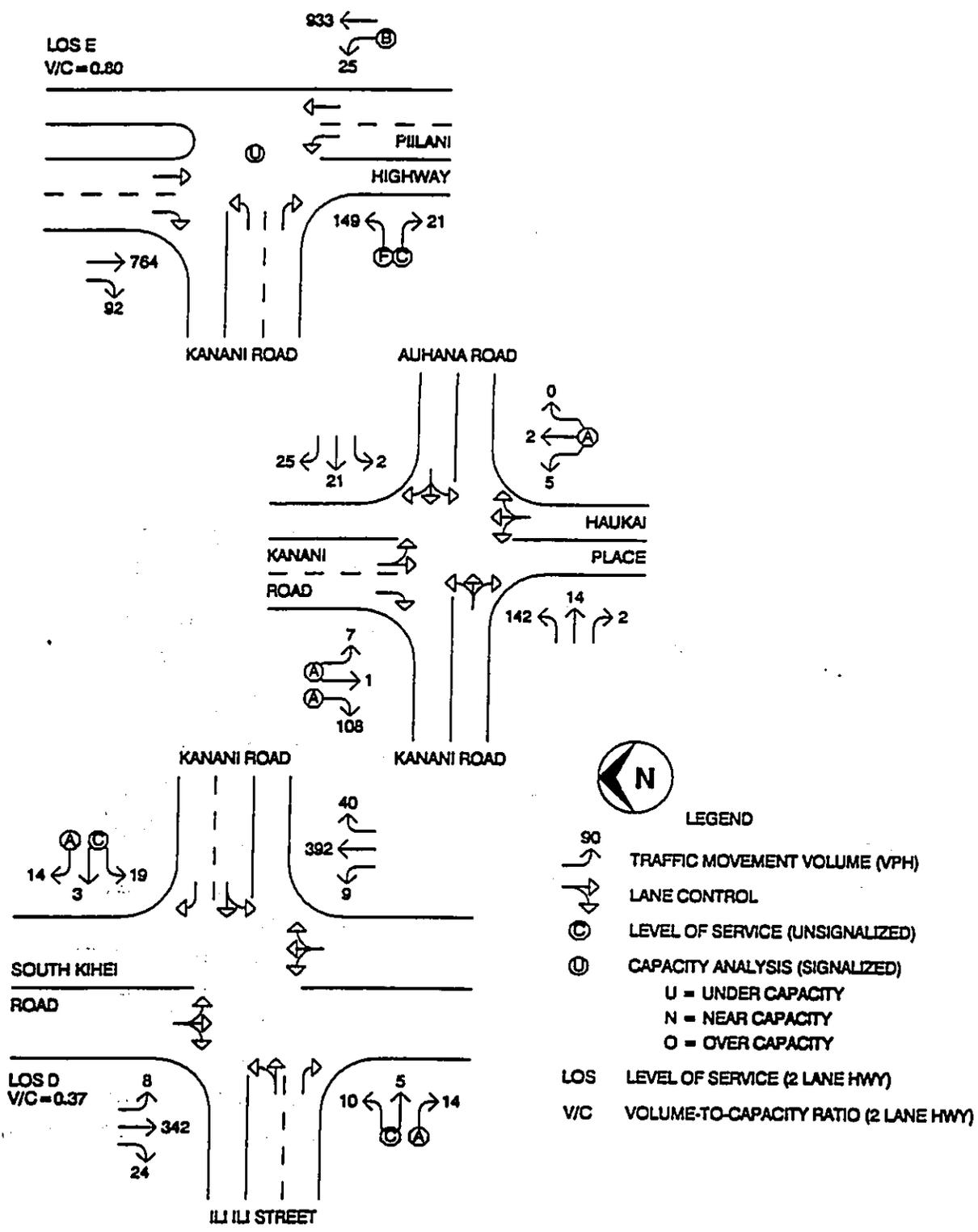


FIGURE 13 - AM PEAK HOUR TRAFFIC W/ PROJECT-KANANI RD

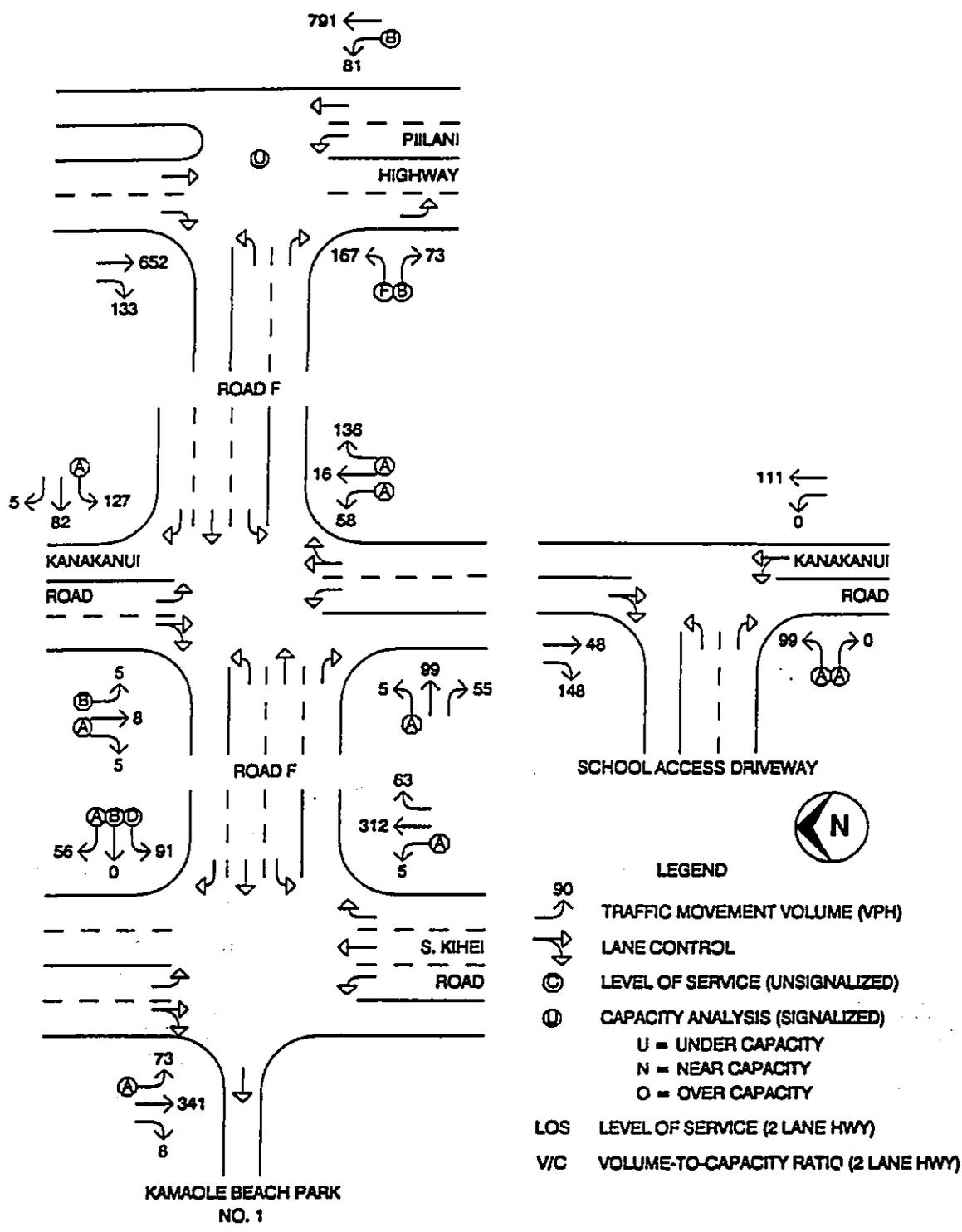


FIGURE 14 - AM PEAK HR TRAFFIC W/ PROJECT-ROAD F

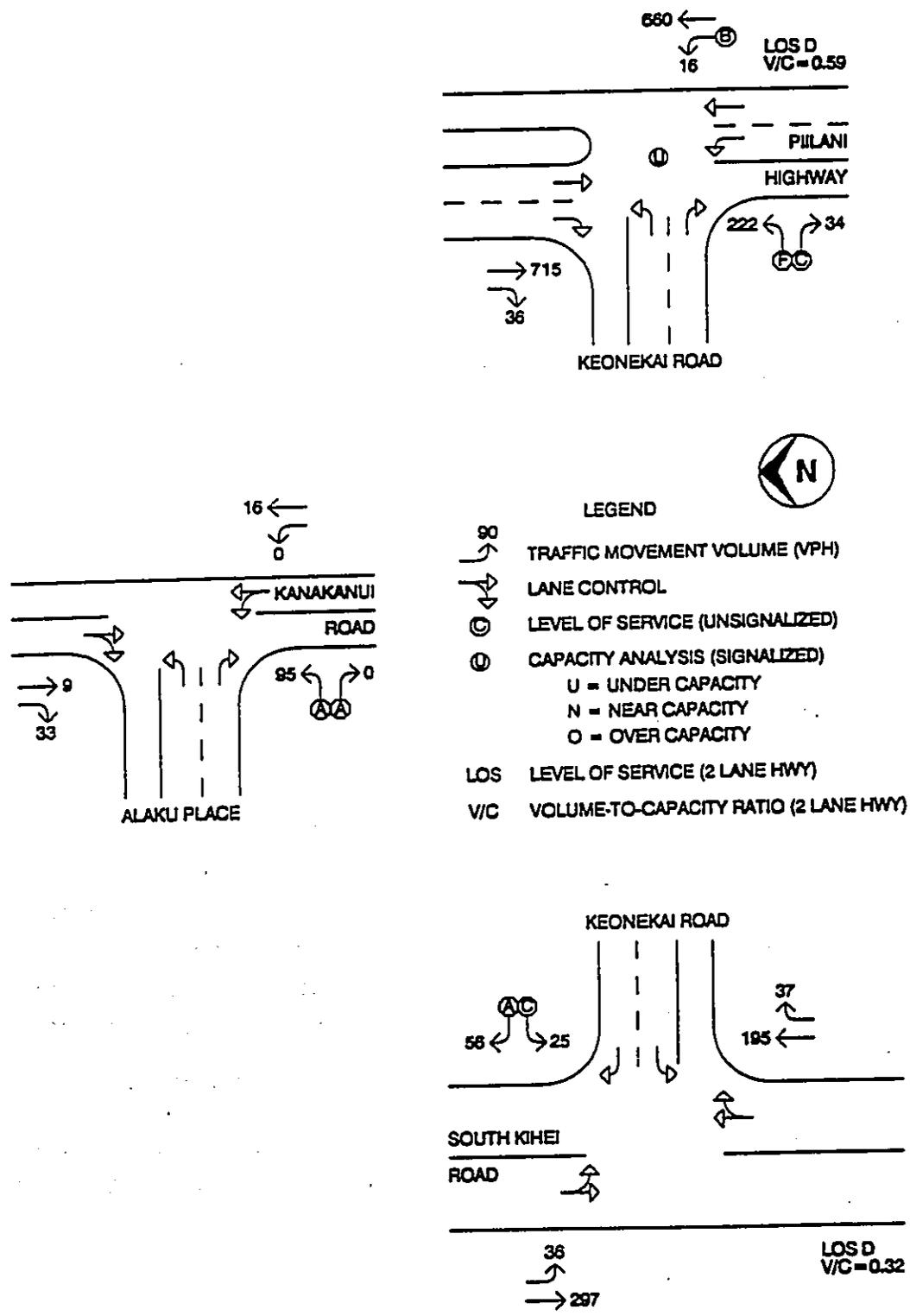


FIGURE 15 - AM PEAK HR TRAFFIC W/ PROJECT-KEONEKAI RD

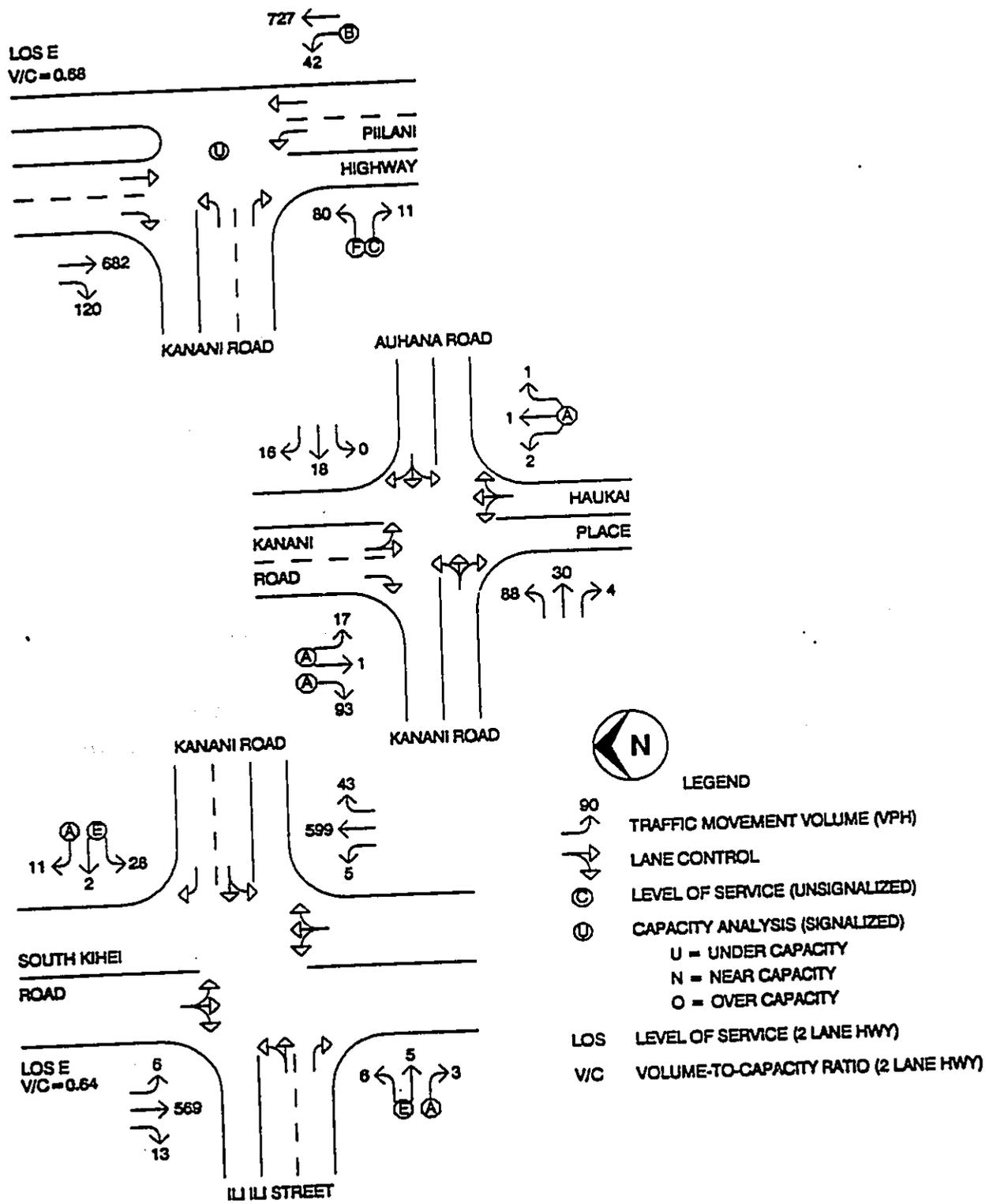


FIGURE 16 - MID PM PEAK HR TRAFFIC W/ PROJECT-KANANI RD

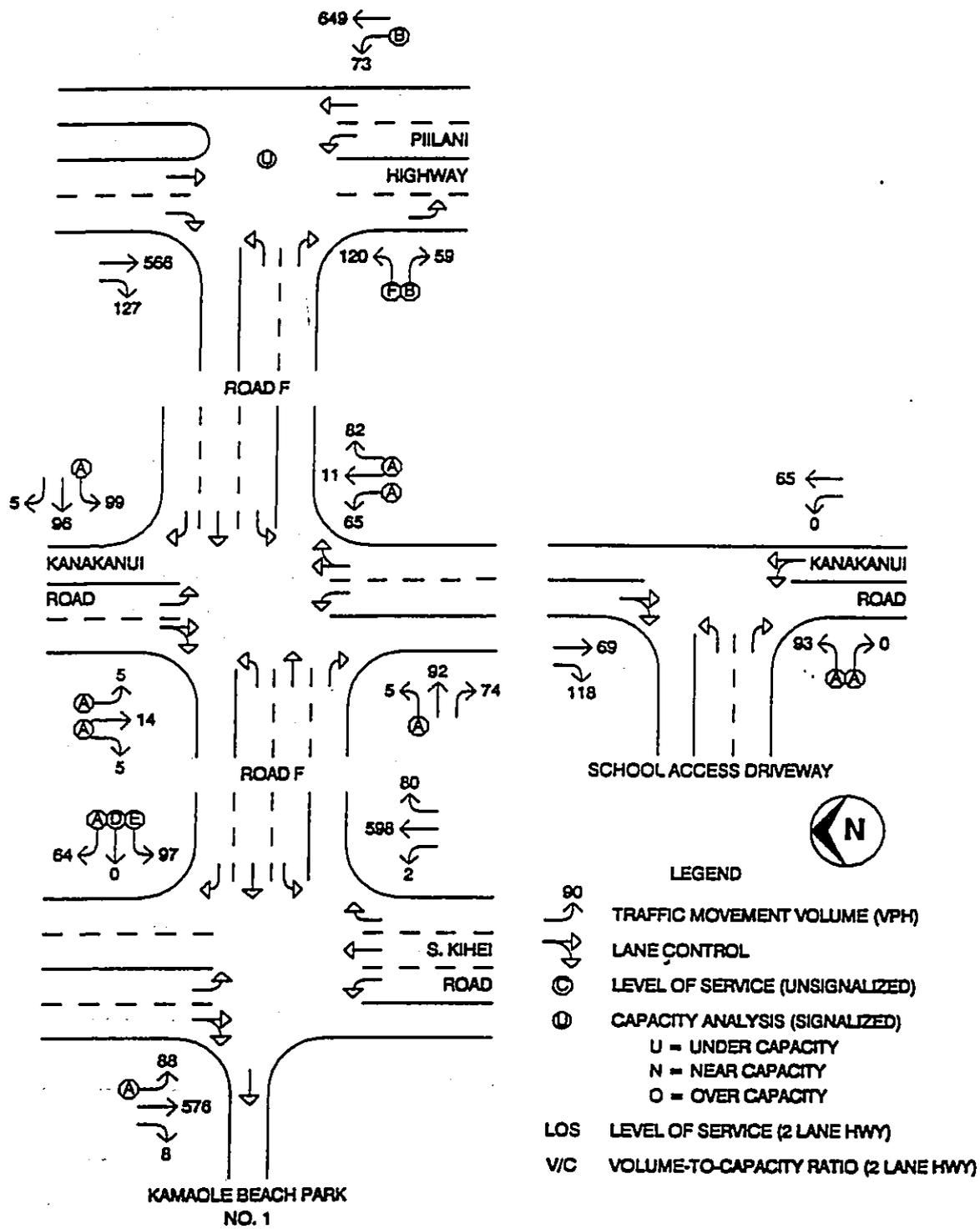


FIGURE 17 - MID PM PEAK HOUR TRAFFIC W/ PROJECT-ROAD F

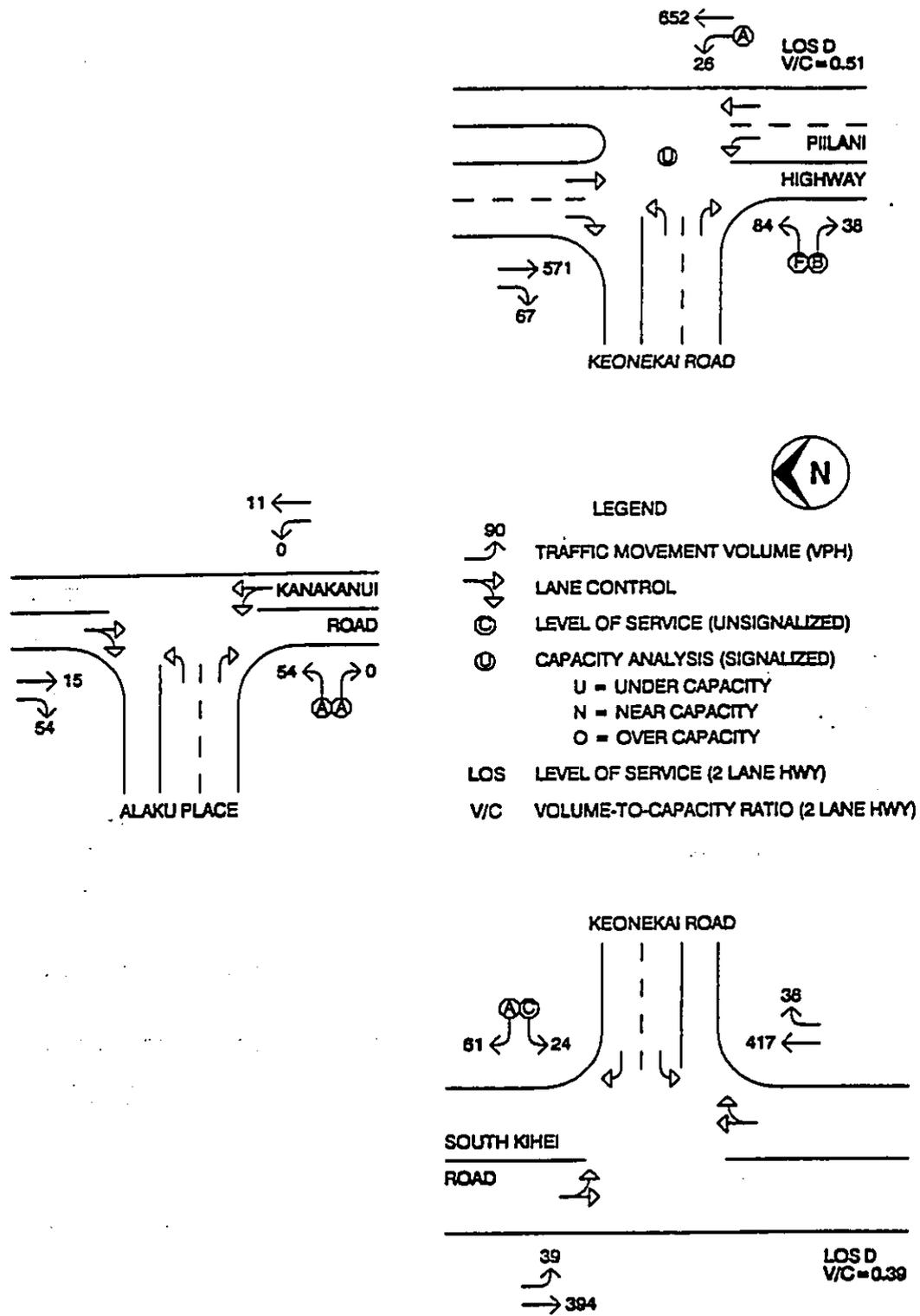


FIGURE 18 - MID PM PEAK HR TRAFFIC W/ PROJECT-KEONEKAI RD

VII. Recommended Road Improvements

A. Improvements To Accommodate the 1996 Traffic Without Project

1. Road F should be constructed to improve access between Piilani Highway and South Kihei Road in the Kamaole area.
2. Kananui Road should be stop-controlled at its intersection with the proposed Road F.
3. The intersection of Piilani Highway and Kanani Road should be signalized, when warranted, to mitigate the LOS "F" conditions expected during the Year 1996 peak hours of analysis without project.
4. The intersection of Piilani Highway and Keonekai Road should be signalized, when warranted, to mitigate the LOS "F" conditions expected during the Year 1996 peak hours of analysis without project.
5. The intersection of Piilani Highway and the proposed Road F should be signalized, when warranted, to mitigate the LOS "F" conditions expected during the Year 1996 peak hours of analysis without project.
6. Kananui Road, between Alaku Place and Keonekai Road, should be restricted to local traffic only to mitigate the impact of the drainage crossing during severe rainstorms.

B. Improvements to Accommodate the Site-Generated Traffic

1. The primary access to the proposed elementary school should be located on Kananui Road, to minimize the number of driveways on Road F. The access driveway on Keonekai Road should be located as far south from Road F as possible to mitigate potential queuing problems.
2. Kananui Road should be upgraded to County collector road standards, including curb, gutter, and sidewalks.
3. Clear lines of sight from the project access driveways should be established to accommodate adequate intersection sight distance. This can be accomplished by clearing "sight triangles" from the project driveway of any obstructions. Appropriate sight distances should be determined at the design stage of the project.

VIII. Conclusions

The evening peak hour of traffic is not expected to be significantly impacted by the proposed elementary school, based upon the trip generation analysis performed for this study. Therefore the evening peak hour traffic was not analyzed in this study. However, the evening peak hour traffic operations should be analyzed to determine the traffic impacts of Road F during the PM peak hour. Specific recommendations on Road F are deferred to the evening peak hour analysis. Road F is expected to reduce peak hour traffic on Kanani Road and Keonekai Road during the morning and mid-afternoon peak hours of traffic.

Based upon the analysis and recommendations discussed herein, the proposed Kihei Elementary School II is not expected to have any significant impacts on traffic operations in the study area.

Appendix D

Drainage Study

**DRAINAGE STUDY
FOR
NEW KIHEI ELEMENTARY SCHOOL
AT
KIHEI, MAUI, HAWAII**

PREPARED FOR:

**DOWLING COMPANY, INC.
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PREPARED BY:

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CONSULTING ENGINEERS
2115 WELLS STREET
WAILUKU, MAUI, HAWAII 96793**

MAY 1994

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 - E. EXISTING DRAINAGE CONDITIONS

I. PURPOSE

This report examines how existing drainage patterns affect the proposed school site. It also evaluates how development of the site will affect these patterns. The report also studies what drainage improvements will be required to minimize the threat of flooding to adjacent areas.

II. PROJECT LOCATION

The project site is located on the makai side of Kananui Road, approximately 1/3 mile north of Keonekai Road. The site is bordered by Kananui Road and Piilani Highway to the east. It is also bordered by undeveloped lands to the north, west, and south. The site can further be identified by Tax Map Key 3-9-19 Parcel 6, refer to Exhibit A and B.

III. PROJECT DESCRIPTION

Ultimately the new Kihei Elementary School will have 48 classrooms, 40 permanent and 8 portable, refer to Exhibit C. Other improvements will include a cafetorium, library, paved access roads and parking areas, play areas, and underground utilities. The school will have a design enrollment of 850 to 900 students and 61 staff.

IV. FLOOD HAZARD

According to the "Flood Insurance Rate Maps" for the County of Maui, the project is located on land designated as Zone "C". Zone "C" indicates areas where the risk of flooding is minimal. Refer to Exhibit D, Flood Insurance Rate Map.

V. STORM RUNOFF

A. EXISTING RUNOFF CONDITIONS

Presently, the project site is undeveloped with kiawe trees and buffle grass covering the site. Elevations on the site range from 124 to 94 feet above main sea level with slopes varying from 1 to 5 percent. Soil on the site is composed of a surface layer of sand, some rock, and an underlying layer of cemented sand. The permeability is rapid above the cemented layer and the runoff is usually slow. Under these conditions, the site produces runoff at a rate of 5.67 cfs. The runoff flows in a southerly direction and sheet flows off the site. Storm flow generate from the site runoff eventually makes its way to South Kihei Road where it is deposited in the road's drainage system.

Offsite runoff from lands mauka of Piilani Highway(Drainage Basin 22A) sheet flows into three(3) 36-inch drainage culverts located under Piilani

Highway. Refer to Exhibit E. According to the Hydrology Report for Piilani Highway, these culverts carry a 50-year storm flow of 91 cfs and a 100-year flow of 125 cfs. The culverts outlet the flow near the north-east corner of the site where it sheet flows into Kamaole Gulch. The gulch takes the runoff down to the Maui Coast Hotel. Two (2) 72-inch culverts pick-up the flow from the gulch and passes it under the hotel's parking lot. The runoff then crosses under South Kihei Road via an 8.5 x 7 arch pipe and outlets into the ocean.

B. DEVELOPED RUNOFF CONDITIONS

Storm runoff for existing and developed conditions were calculated using the Rational Method. Based on a 1-hour, 10-year storm and a 1-hour, 50-year storm, the project will produce runoff at a rate of 23.44 cfs and 24.93 cfs respectively.

Concrete drain inlets will be used to collect storm runoff from the project. The runoff will be piped to a retention basin/play field area located at the north-west corner of the project's lot. The retention basin will have an emergency spill over which will connect into the drainage system included in the design of Road "F".

Existing off-site runoff will not enter the project site. The off-site runoff along with the drainage system for Road "F" is being addressed by Austin, Tsutsumi & Associates, Inc. for Koahē Limited Partnership under the Kamaole Homesteads Project.

VI. SOIL EROSION CONTROL

According to the U.S. Department of Agriculture (Reference 3), soil within the project site is classified as Puuone Sands, 7 to 30 percent slopes (PZUE.)

Calculations show that grading of the entire site will result in a total soil loss during construction of 7.6 tons/acre/year with a severity number of 1277. The allowable erosion rate is 297.6 tons/acre/year and present standards allow for a maximum severity number of 50,000. Therefore, normal erosion control measures implemented during construction should be adequate to control soil loss from the project site.

Estimated soil loss was calculated using the universal soil loss equation in accordance with the County of Maui's Grading Ordinance.

IX. APPENDICES

- A - HYDROLOGIC CALCULATIONS - EXISTING
CONDITION
- B - HYDROLOGIC CALCULATIONS - DEVELOPED
CONDITIONS
- C - EROSION CONTROL CALCULATIONS

VII. CONCLUSION

Development of the New Kihei School is not expected to cause any adverse effects to adjacent or downstream developments. Storm flows from the project will be collected using concrete drain inlets and stored on the site by means of a retention basin. The retention basin will have an emergency spillover which will connect into Road F's drainage system. This drainage system along with offsite runoff from lands mauka of Piilani Highway is being addressed by Austin, Tsutsumi & Associates, Inc. under the Kamaole Homestead Project. Finally, soil loss during construction is below the County's allowable rate so erosion during construction is not expected to be a problem.

VIII. REFERENCE

1. County of Maui, "Revised Interim Drainage Standards for County of Maui" January 1994.
2. Department of Public Works, City and County of Honolulu, Division of Engineering, "Storm Drainage Standards", March 1986.
3. Flood Insurance Rate Map for the County of Maui Federal Emergency Management Agency, Federal Insurance Administration, June 1981.
4. Soil Survey of Island of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii, August 1972, prepared by The United States Department of Agriculture Soil Conservation Service.
5. Hydrology Report for Piilani Highway Island of Maui, prepared by Trans-Meridian Engineers & Surveyors, Inc.
6. County of Maui, Hawaii "Guidelines for Computing Allowable Erosion Rate, Uncontrolled Erosion Rate, and Reductions Needed to Meet the Standard, Island of Maui, Molokai, Lanai", March 1975.
7. U.S. Department of Agriculture, Soil Conservation Service, "Erosion and Sediment Control Guide for Hawaii, Honolulu, Hawaii, March 1981.

APPENDIX A

HYDROLOGIC CALCULATIONS - EXISTING CONDITIONS

Hydrologic calculations for existing on-site runoff were done using the Rational Method. Factors used in the calculations were obtained from the Interim Drainage Standards for County of Maui.

The following factors were used:

- A. Recurrence Interval:
10-Year, 1-Hour Storm $I=2.0"$ (Plate 4)

- B. Time of Concentration:
 $T_c = 22.5$ min. (Plate 1)
 $L = 950$
 $S = 2.6\%$

- C. Rainfall Intensity:
 $i_{10} = 3.15$ in/hr (Plate 2)

- D. Runoff Coefficient:
 c - Determined from Table 1 as follows:

Infiltration	0.00 (High)
Relief	0.00 (Flat)
Vegetal Cover	0.00 (High)
Dev. Type	<u>0.15 (Agriculture)</u>
c	= 0.15

Existing runoff conditions and quantities are shown in Appendix B under Runoff Summary.

APPENDIX B

HYDROLOGIC CALCULATIONS DEVELOPED CONDITIONS

Hydrologic calculations for developed on-site runoff were done using the Rational Method. Factors used in the calculations were obtained from the Interim Drainage Standards for County of Maui.

The following factors were used:

1. Recurrence Interval:
10-Year, 1-Hour Storm I=2.0" (Plate 4)
50-Year, 1-Hour Storm I=2.1" (Plate 7)
2. Time of Concentration:
T_c = 22.5 Determined from (Plate 1)
L = 950
S = 2.6%
3. Rainfall Intensity:
i₁₀ = 3.15 in/hr (Plate 2)
i₅₀ = 3.35 in/hr (Plate 2)
4. Runoff Coefficient:
c - Determined from Table 1, as follows:

Infiltration	0.14 (Slow)
Relief	0.00 (Flat)
Vegetal Cover	0.03 (Good)
Dev. Type	<u>0.45 (School)</u>
c	= 0.62

Developed runoff conditions and quantities are shown in the Runoff Summary Chart.

APPENDIX C

EROSION CONTROL CALCULATIONS

A. SITE CONDITIONS

According to the "Soil Survey of Island of Kauai, Oahu, Maui, Molokai and Lanai", State of Hawaii, August 1972, the soil within the project site is classified as Puuone Sand, 7 to 30 percent slopes (PZUE). This soil has rapid permeability above the cemented layer, slow runoff, and the hazard by wind erosion is moderate to severe.

B. ESTIMATED SOIL LOSS

The equation used for estimating soil loss, as set forth by the County of Maui's Grading Ordinance is as follows:

$$E = R K L_s C P$$

Where:

E	=	Soil Loss in Tons/Acre/Year
R	=	Rainfall Factor 155/Tons/Acre/Year
K	=	Soil Erodibility Factor = 0.10
L _s	=	Topographic Factor = 0.49 Slope Length (L) = 950 Average Slope (S) = 2.6%
C	=	Cover Factor = 1.0 (Bare Soil)
P	=	Erosion Control Practice Factor 1.0 (For Non-Agricultural Lands)
E	=	155 x 0.10 x 0.49 x 1 x 1 = 7.60 Tons/Acre/Year

C. ALLOWABLE SOIL LOSS

Coastal Water Hazard (D) = 2 (Class "A" Water)
Downstream Hazard (F) = 4 (Adjacent to an existing subdivision)
Time Duration of Project (T) = 1.0 Year
Maximum Allowable Construction Area x Erosion Rate = 3,571 Tons/Acre
Area of Disturbance(A) = 12.00 Acres
Maximum Allowance Erosion Rate = 3,571/12.00 = 297.6 Tons/Acre/Year

D. SEVERITY RATING

ALLOWABLE RATING = 50,000

CALCULATED SEVERITY RATING (H) = (2FT + 3D)AE

Where:

Downstream Hazard (F) = 4(Adjacent to an existing subdivision)

Time Duration of Project (T) = 1 Year

Potential sediment Damage (D) = 2 (Class "A" Water)

Area of Disturbance (A) = 12.00

Annual Soil Loss (E) = 7.60 Tons/Acre/Year

H = (2 x 4 x 1.0 + 3 x 2) (12.00) (7.60) = 1,277 < 50,000 allowable rating.

E. EROSION CONTROL REPORT

The following procedures should be implemented during construction of the project.

1. Leave natural vegetation undisturbed in areas not needed for immediate construction.
2. Use waterwagons and/or sprinklers to control dust.
3. Water down graded areas after construction activity has ceased for the day and during weekend and holidays.
4. Construct drainage improvements as soon as possible.
5. Grass or landscape exposed areas immediately after grading work is finished.

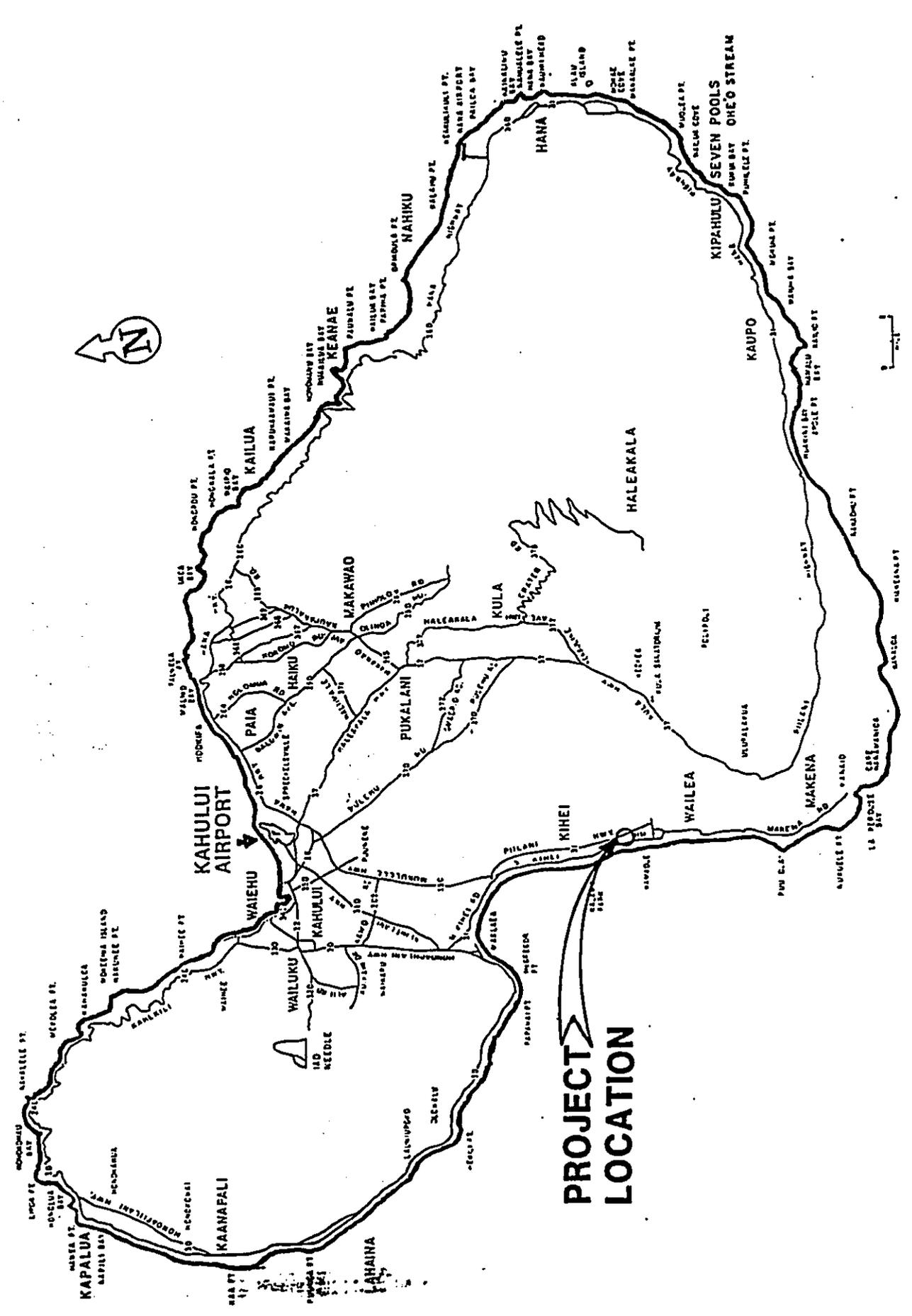
Other erosion control measures may be implemented if necessary.

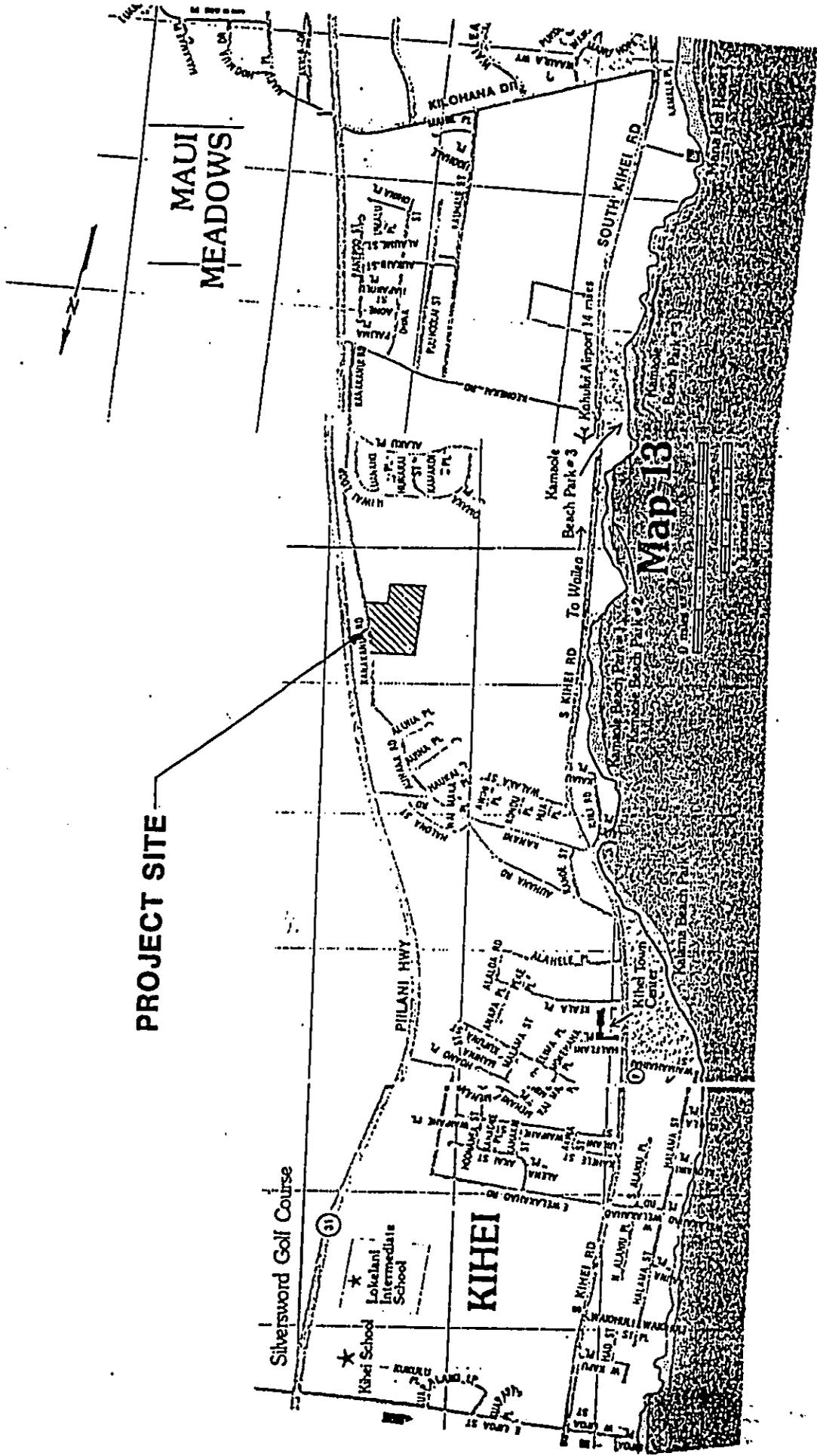
X. EXHIBITS

- EXHIBIT A - ISLAND MAP
- EXHIBIT B - LOCATION MAP
- EXHIBIT C - DEVELOPED SITE
- EXHIBIT D - FLOOD INSURANCE MAP
- EXHIBIT E - EXISTING DRAINAGE CONDITIONS

EXHIBIT A ISLAND MAP

ISLAND OF MAUI





PROJECT SITE

MAUI
MEADOWS

KIHAI

Silversword Golf Course

Kihai School

Lohelani Intermediate School

Map 13

LOCATION MAP

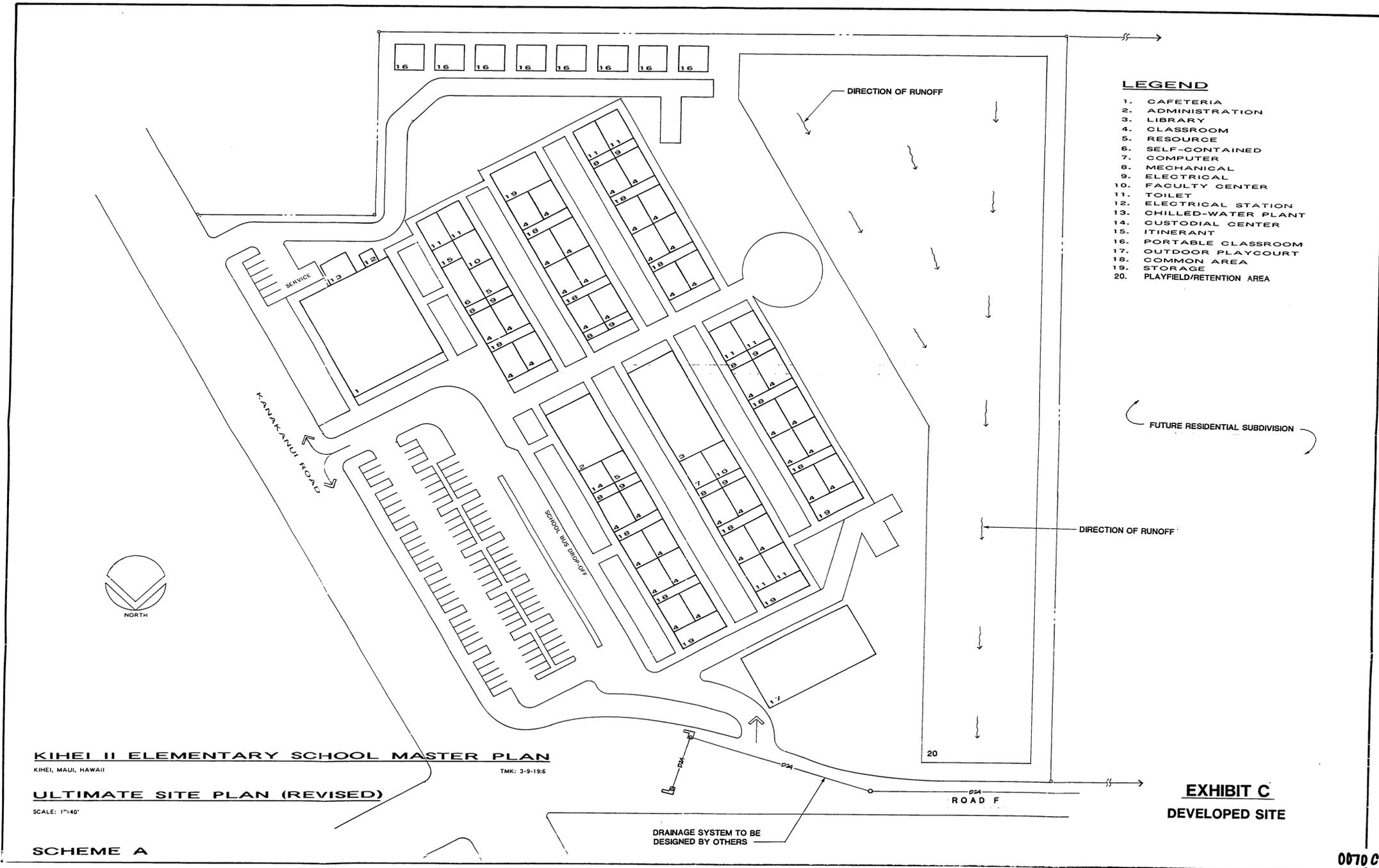
SCALE: AS SHOWN

EXHIBIT B

**OVERSIZED
DRAWING/MAP**

**PLEASE SEE
35MM ROLL**

0070 C



- LEGEND**
- 1. CAFETERIA
 - 2. ADMINISTRATION
 - 3. LIBRARY
 - 4. CLASSROOM
 - 5. RESOURCE
 - 6. SELF-CONTAINED
 - 7. COMPUTER
 - 8. MECHANICAL
 - 9. ELECTRICAL
 - 10. FACULTY CENTER
 - 11. TOILET
 - 12. ELECTRICAL STATION
 - 13. CHILLED-WATER PLANT
 - 14. CUSTODIAL CENTER
 - 15. ITINERANT
 - 16. PORTABLE CLASSROOM
 - 17. OUTDOOR PLAYCOURT
 - 18. COMMON AREA
 - 19. STORAGE
 - 20. PLAYFIELD/RETENTION AREA

KIHEI II ELEMENTARY SCHOOL MASTER PLAN
 KIHEI, MAUI, HAWAII

TMR: 3-9-1986

ULTIMATE SITE PLAN (REVISED)

SCALE: 1"=40'

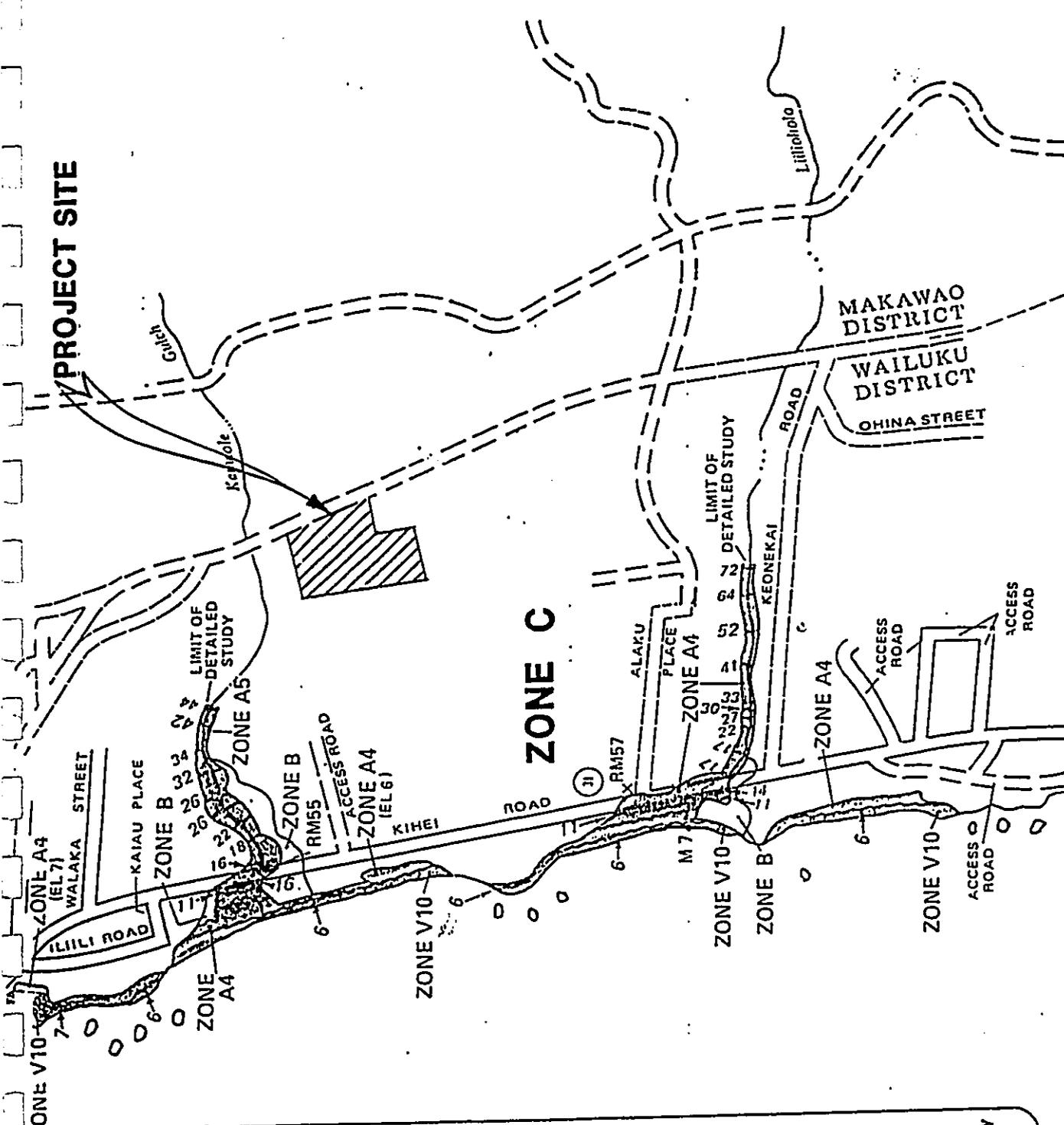
SCHEME A

EXHIBIT C
DEVELOPED SITE

DRAINAGE SYSTEM TO BE
 DESIGNED BY OTHERS

0070 C

PROJECT SITE



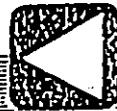
NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MAUI COUNTY, HAWAII

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

COMMUNITY-PANEL NUMBER
150003 0265 B
EFFECTIVE DATE:
JUNE 1, 1981



federal emergency management agency
federal insurance administration

EXHIBIT D
FLOOD INSURANCE MAP

**OVERSIZED
DRAWING/MAP**

**PLEASE SEE
35MM ROLL**

0070 D

