Final Environmental Assessment

PROPOSED LAHAINA CIVIC CENTER TENNIS COURTS COMPLEX EXPANSION

(TMK (2) 4-5-021:010 (POR.), 016 (POR.) AND 020 (POR.))

Prepared for:

County of Maui,
Department of Parks and Recreation

September 2008

MUNEKIYO HIRAGA, INC.

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Executive Summary

Project Name:	Lahaina Civic Center Tennis Courts Complex Expansion
Type of Document:	Final Environmental Assessment
Legal Authority:	Chapter 343, Hawai`i Revised Statutes
Agency Determination:	Finding of No Significant Impact
Applicable Environmental Assessment Review "Trigger":	Use of State lands and County funds
Location:	Island of Maui Lahaina TMK (2)4-5-021:10 (por.), 016 (por.), and 020 (por.)
Applicant:	County of Maui Department of Parks and Recreation 700 Hali`a Nakoa Street Wailuku, Hawai`i 96793
Approving Agency:	County of Maui Department of Parks and Recreation 700 Hali`a Nakoa Street Wailuku, Hawai`i 96793
Consultant:	Munekiyo & Hiraga, Inc. 305 High Street, Suite 104 Wailuku, Hawai`i 96793 Contact: Michael Munekiyo Telephone: (808) 244-2015
Project Summary:	The County of Maui, Department of Parks and Recreation proposes to undertake the Lahaina Civic Center Tennis Courts Complex Expansion Project. The additional four (4) tennis courts with sports lighting, fencing and windscreens will cover approximately 2.0 acres. Related improvements include a 25-stall paved parking lot and improvements to existing site utilities which include water, wastewater, drainage, and electrical systems.

The proposed action involves the use of State of Hawai`i lands (TMK Nos. (2)4-5-021:010 (por.) and 016 (por.)), as well as lands owned by the State Department of Hawaiian Home Lands (TMK (2)4-5-021:020 (por.)). County funds will be used for the proposed tennis courts expansion project. In light of the foregoing, an Environmental Assessment has been prepared pursuant to Chapter 343, Hawai`i Revised Statutes.

It is additionally noted that the project site falls within the County of Maui's Special Management Area or SMA. Accordingly, a SMA Use Permit Application has been filed with the Maui Planning Department.

I. PROJECT OVERVIEW

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A. PROJECT LOCATION, EXISTING USE, AND OWNERSHIP

An expansion of the tennis courts complex at the Lahaina Civic Center (LCC) is proposed by the County of Maui, affecting Tax Map Key (TMK) Nos. (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) located in Lahaina, Maui, Hawai`i. See **Figure 1**. The proposed expansion will add four (4) new tennis courts to the LCC tennis complex. The existing tennis complex consists of five (5) tennis courts and is located south of LCC's main facilities and adjacent to the Lahaina Post Office. The project site is accessible via the Leiali`i Parkway and Honoapi`ilani Highway intersection. See **Figure 2**.

The proposed expansion will affect the area immediately north of the existing tennis courts complex. The land areas affected by the proposed action are summarized in **Table 1**.

Table 1. Affected Parcels and Areas

Tax Map Key No.	Area of Parcel	Portion of Parcel Affected by Proposed Project
(2) 4-5-021:010	3.849 acres	0.7 acres
(2) 4-5-021:016	16.782 acres	0.2 acres
(2) 4-5-021:020	50.858 acres	1.1 acres
TOTAL AREA ENCOMPASSED BY EXPANSION		**2.0 acres**

The subject parcels are owned by the State of Hawai`i and the State Department of Hawaiian Home Lands as described in **Table 2**. Further, it is noted that Parcels 10 and 16 are designated as Section 5(b) Ceded Lands. The State holds the Ceded Lands corpus in trust for Native Hawaiians and the general public.

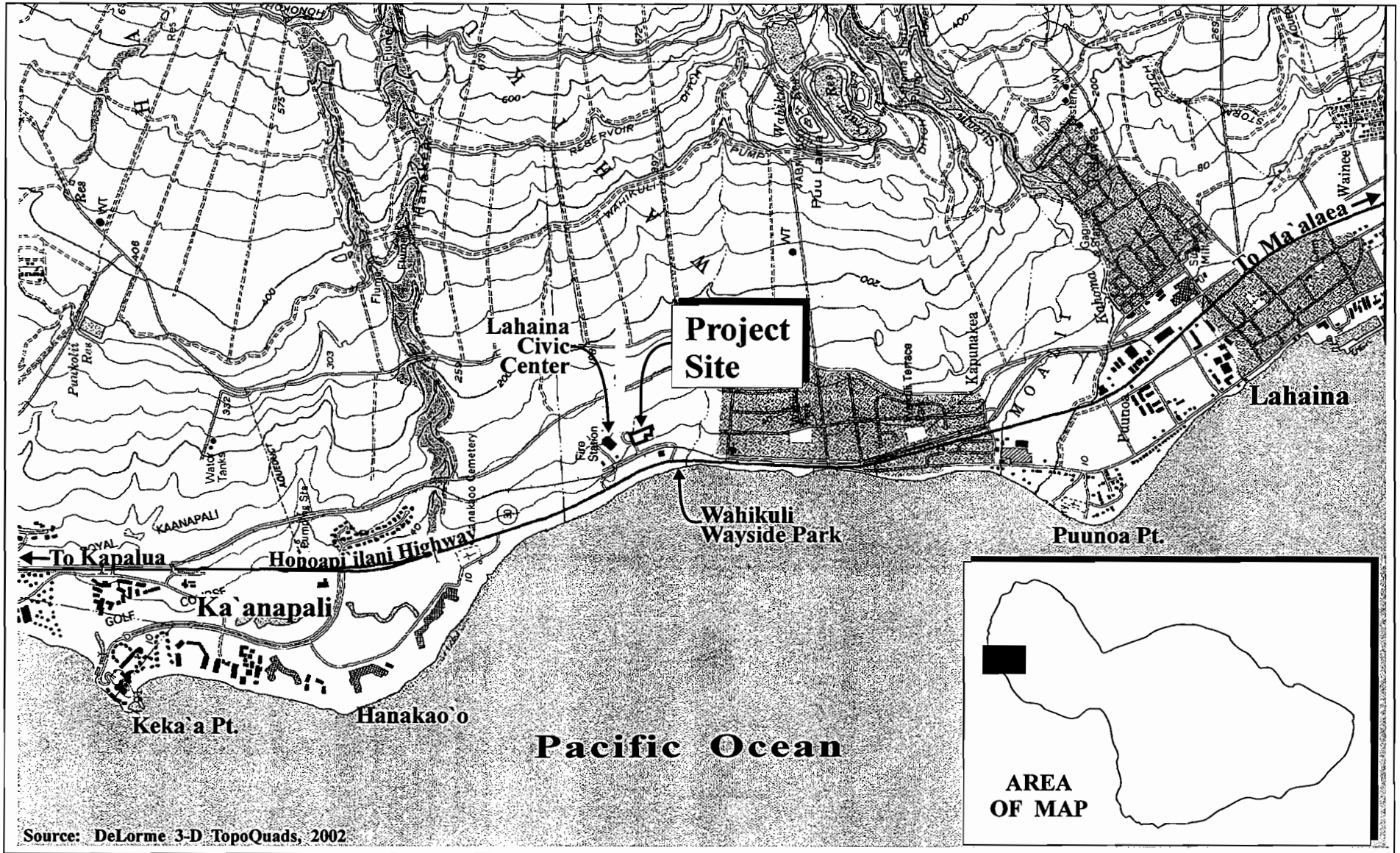

Figure 1 Proposed Lahaina Civic Center Tennis Courts Complex Expansion

Regional Location Map

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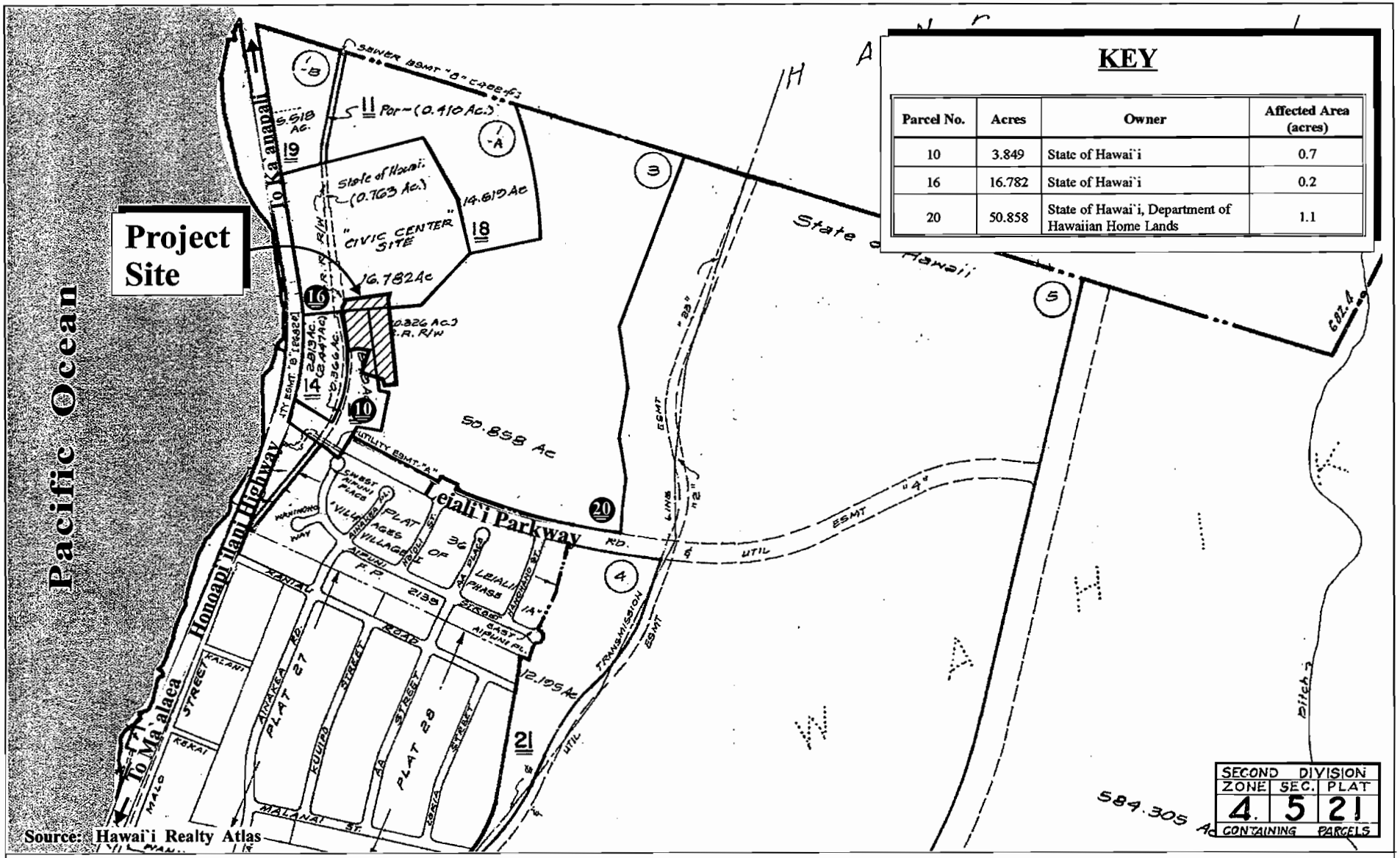

KEY

Parcel No.	Acres	Owner	Affected Area (acres)
10	3.849	State of Hawai`i	0.7
16	16.782	State of Hawai`i	0.2
20	50.858	State of Hawai`i, Department of Hawaiian Home Lands	1.1

SECOND DIVISION		
ZONE	SEC.	PLAT
4.	5	21
CONTAINING		PARCELS

Figure 2 Proposed Lahaina Civic Center Tennis Courts Complex Expansion

Property Location Map

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Table 2. Existing Use and Ownership of Affected Parcels

Tax Map Key No.	Owner	Existing Use
(2) 4-5-021:010	State of Hawai`i	Lahaina Civic Center Tennis Courts Complex, consisting of 5 tennis courts
(2) 4-5-021:016	State of Hawai`i	Lahaina Civic Center main facilities, consisting of an amphitheater, social hall, gymnasium, police station, fire station, health center and a courthouse
(2) 4-5-021:020	State of Hawai`i, Department of Hawaiian Home Lands	Vacant Land

The County of Maui has control and management over TMK (2)4-5-021:010 and 016 for the LCC in accordance with Executive Order Nos. 3282 and 3139.

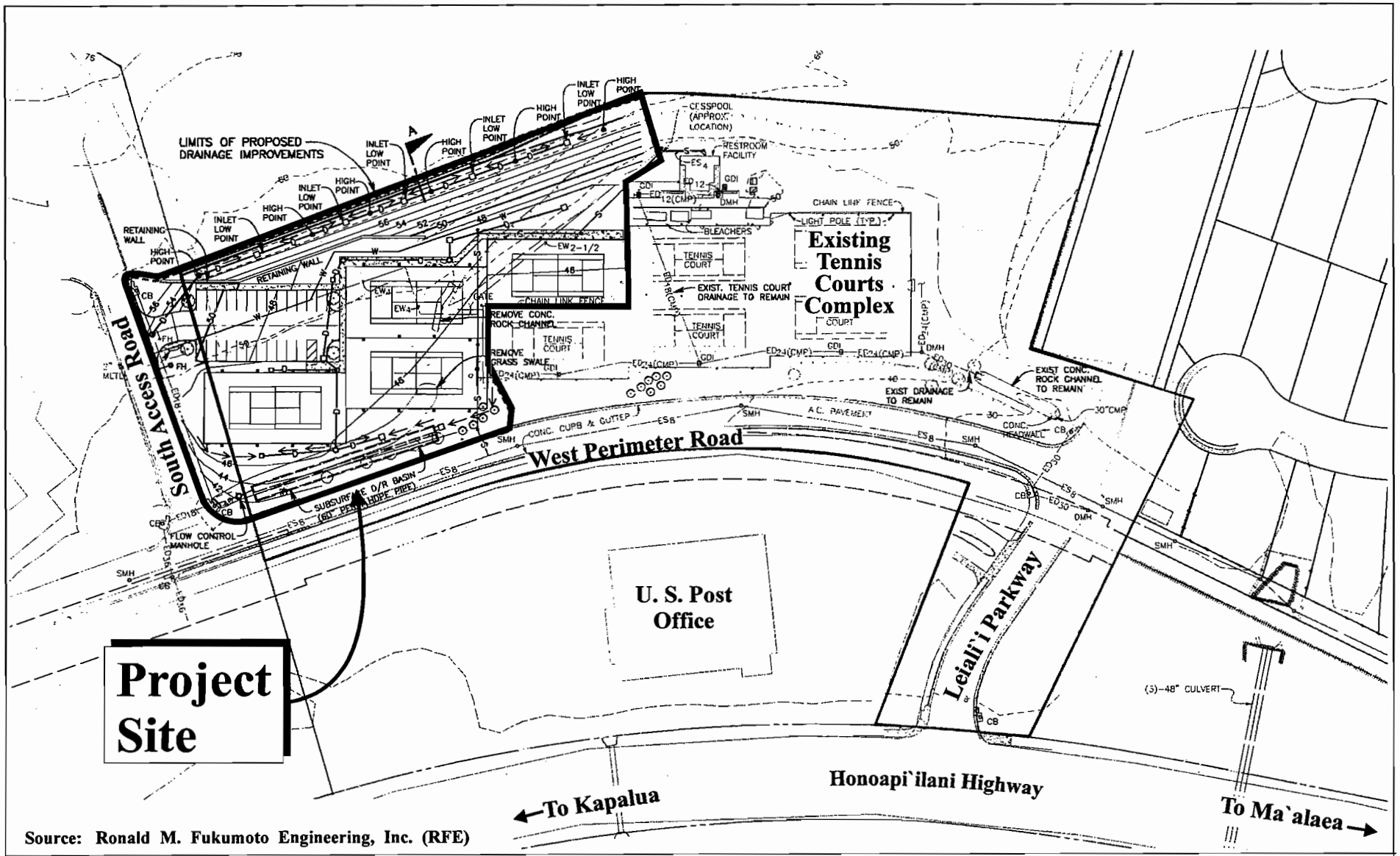
B. PROPOSED ACTION

The County of Maui, Department of Parks and Recreation, proposes an expansion of the LCC tennis courts complex. The existing tennis courts complex encompasses TMK No. (2) 4-5-021:010, plus a small portion of TMK No. (2) 4-5-021:020. The complex currently includes five (5) tennis courts, a comfort station, overhead lighting, and related supporting improvements.

The proposed expansion will consist of an additional four (4) tennis courts. See **Figure 3**. These tennis courts will have fencing, sports lighting, and windscreens. A 25-stall paved parking lot with lighting, lighted walkway access paths, retaining walls, landscape plantings, irrigation, and site utilities are also a part of the proposed action. The site utilities improvements will address water, wastewater, drainage, and electrical systems. The water system improvements will consist of the relocation of a water meter manhole, relocation of a fire hydrant, water service lines, and drinking fountains. The wastewater system improvements will include a sewer lateral for the comfort station located mauka of the existing tennis courts.

The drainage system improvements will consist of channels, inlets, manholes, drain pipes, and a subsurface detention/retention basin. The electrical system improvements will include underground distribution lines for the lighting.

The proposed expansion of the existing LCC tennis courts complex will provide increased access to tennis recreational facilities for current and future residents and visitors.



Source: Ronald M. Fukumoto Engineering, Inc. (RFE)

Figure 3 Proposed Lahaina Civic Center Tennis Courts Complex Expansion

Site Plan

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C. CHAPTER 343, HAWAI`I REVISED STATUTES REQUIREMENT

The proposed improvements will be funded by the County of Maui on lands owned by the State of Hawai`i. The use of State lands and County funds is a trigger for an Environmental Assessment pursuant to Chapter 343, Hawai`i Revised Statutes (HRS). In particular, based on the anticipated scope of work, the proposed action requires the preparation and processing of an Environmental Assessment.

D. IMPLEMENTATION CONSIDERATIONS

The project site falls within the County of Maui's Special Management Area or SMA. As such, an SMA Use Permit application has been filed with the Maui Planning Department for processing and action by the Maui Planning Commission.

The estimated construction cost for the proposed project is $2.9 million. Construction is programmed to start in March, 2009. Construction duration is anticipated to be approximately six (6) months.

II. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND PROPOSED MITIGATION MEASURES

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A. PHYSICAL SETTING

1. Surrounding Land Uses

a. Existing Conditions

The proposed tennis courts complex expansion project will be located immediately north of the existing tennis complex at the Lahaina Civic Center (LCC). Surrounding the project site on the north side are LCC's main facilities which include a gymnasium, amphitheater and stage, the Lahaina District Court, Fire Station, Police Station, Health Center and Department of Motor Vehicles and Licensing. See **Figure 4**. East of the project site are undeveloped DHHL lands. The Villages of Leiali`i, a DHHL affordable housing development is located to the south. The Lahaina Post Office is located on the west (makai) side of the project site. Other developments in the general area include the Wahikuli House Lots subdivision, located south of the project site, and Wahikuli Wayside Park, located to the west (makai) of Honoapi`ilani Highway. Further northeast of the project site are undeveloped State lands.

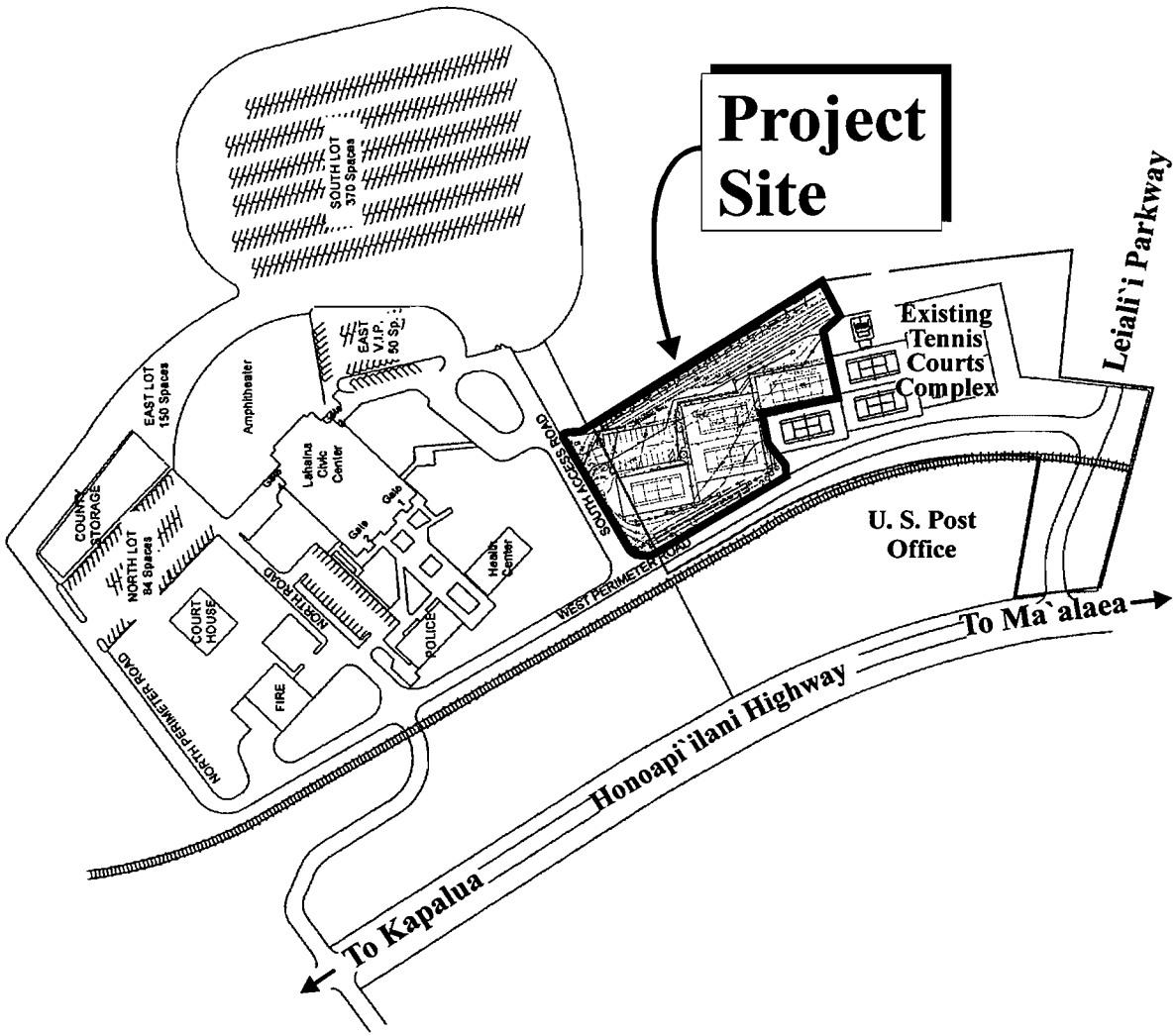
b. Potential Impacts and Proposed Mitigation Measures

The proposed action is intended to provide additional recreational facilities in the West Maui region. The project is not anticipated to have an adverse effect on surrounding commercial, resort, and agricultural uses.

2. Climate

a. Existing Conditions

Like most areas of Hawai`i, Lahaina's climate is relatively uniform year-round. Lahaina's tropical latitude, its position relative to storm tracts and the



Source: County of Maui, Dept. of Parks and Recreation

Figure 4 Proposed Lahaina Civic Center Tennis Courts Complex Expansion

Existing Lahaina Civic Center Site Plan

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Pacific anticyclone, and the surrounding ocean combine to produce this stable climate. Variation in climate among different regions on Maui is largely left to local terrain.

Average temperatures in Lahaina range between 66 degrees and 88 degrees Fahrenheit. August and September are historically the warmest months, while January and February are the coolest (Maui County Data Book, 2006).

Rainfall in Lahaina is highly seasonal, with most precipitation occurring between November and April when winter storms hit the area. Situated on the leeward side of the West Maui Mountains, this region receives most of its rainfall in late afternoon and early evening, after sea breezes take moisture upslope during the day. Precipitation data collected at the Kapalua-West Maui Airport station show that, on average, March is the wettest month with 6.39 inches of precipitation, while December is the driest with just 0.45 inch (Maui County Data Book, 2006).

Wind patterns in the Lahaina area are also seasonal. The northeasterly trade wind occurs 90 percent of the time during the summer, and just 50 percent of the time during the winter. Wind patterns also vary on a daily basis, with trade winds generally being stronger in the afternoon. During the day, winds blow onshore toward the warmer land mass. In the evening, the reverse occurs, as breezes blow toward the relatively warm ocean.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project will not have an adverse effect on the climate. The proposed project will have a low profile and is not anticipated to alter wind patterns in the area.

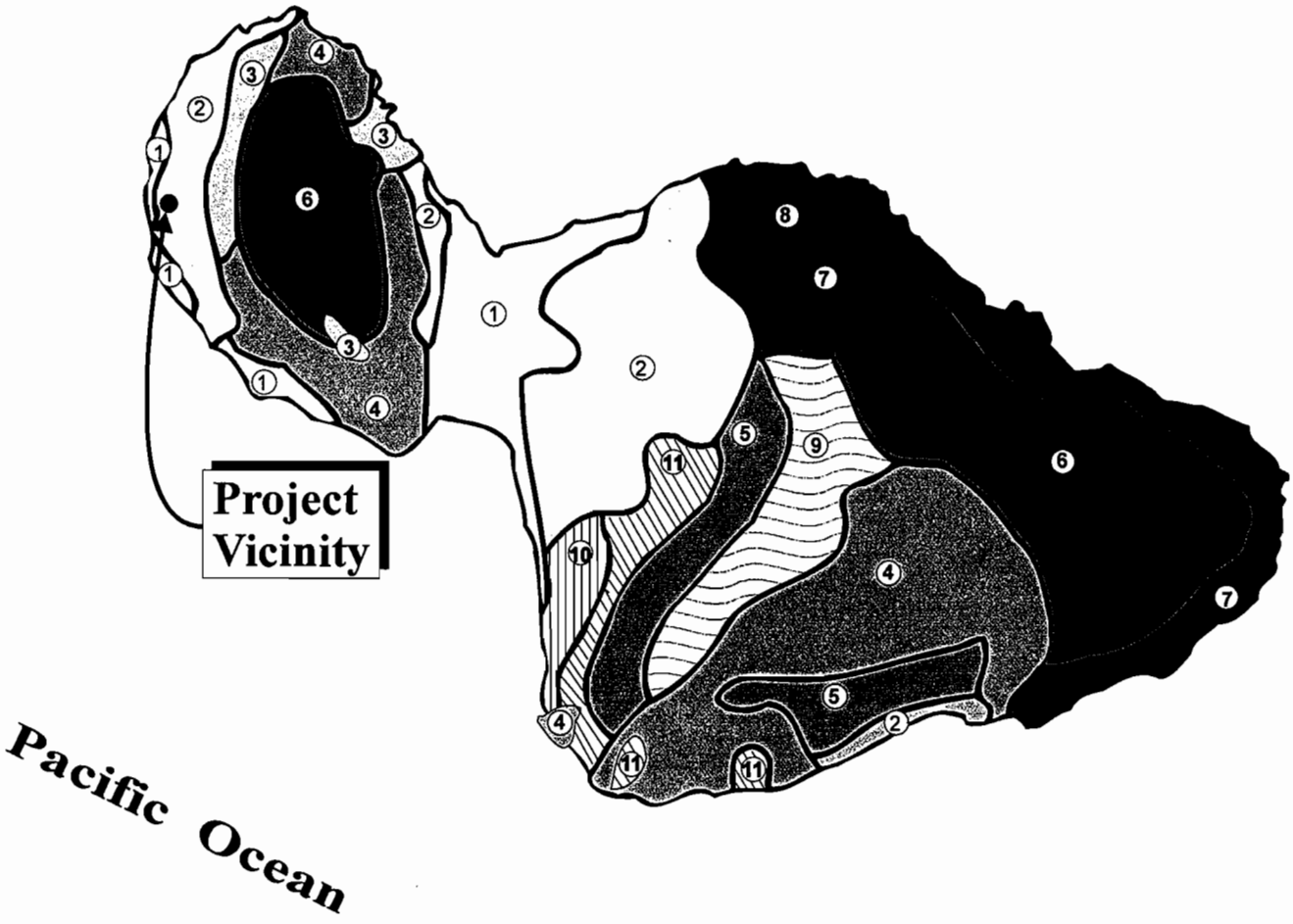
3. Topography and Soil Characteristics

a. Existing Conditions

Underlying the project site are the soils of the Waiakoa-Keahua-Moloka`i association. See **Figure 5**. The Soil Survey of the Islands of Kaua`i, O`ahu, Maui, Moloka`i, and Lana`i, State of Hawai`i, characterizes the soils of this association as being well-drained, moderately fine textured, and occurring in

LEGEND

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



Map Source: USDA Soil Conservation Service

Figure 5 Proposed Lahaina Civic Center Tennis Courts Complex Expansion
Soil Association Map

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low uplands. Soils of this association have developed in material weathered from basic igneous rocks.

Soils underlying a portion of the project site are of the Wahikuli Series, more specifically Wahikuli very stony silty clay, 3 to 7 percent slopes (WdB). The remaining portions of the project site have soils classified as Wahikuli stony silty clay, 3 to 7 percent slopes (WcB). See **Figure 6**. Both of these soils have moderate permeability, slow runoff and the erosion hazard is slight. The soils of this series are gently to moderately sloping and are geographically associated with Lahaina and Moloka`i soil.

The WcB soils have a dark-reddish brown surface layer and have enough stones on the surface to hinder cultivation. The WdB soils also have a dark-reddish brown surface layer and can have as much as 3 percent of the surface covered by stones. Both of these soil types are used primarily for sugarcane and a small acreage is used for homesites.

Elevations of the site range from about 40 feet to 60 feet above mean sea level. The site generally slopes in an east to west direction. The steepest areas are at the easterly and southwesterly ends with slopes that range from about 20 to 40 percent. The flattest areas are at the northwesterly end of the site with slopes that range from about 4 to 8 percent. See **Figure 7**.

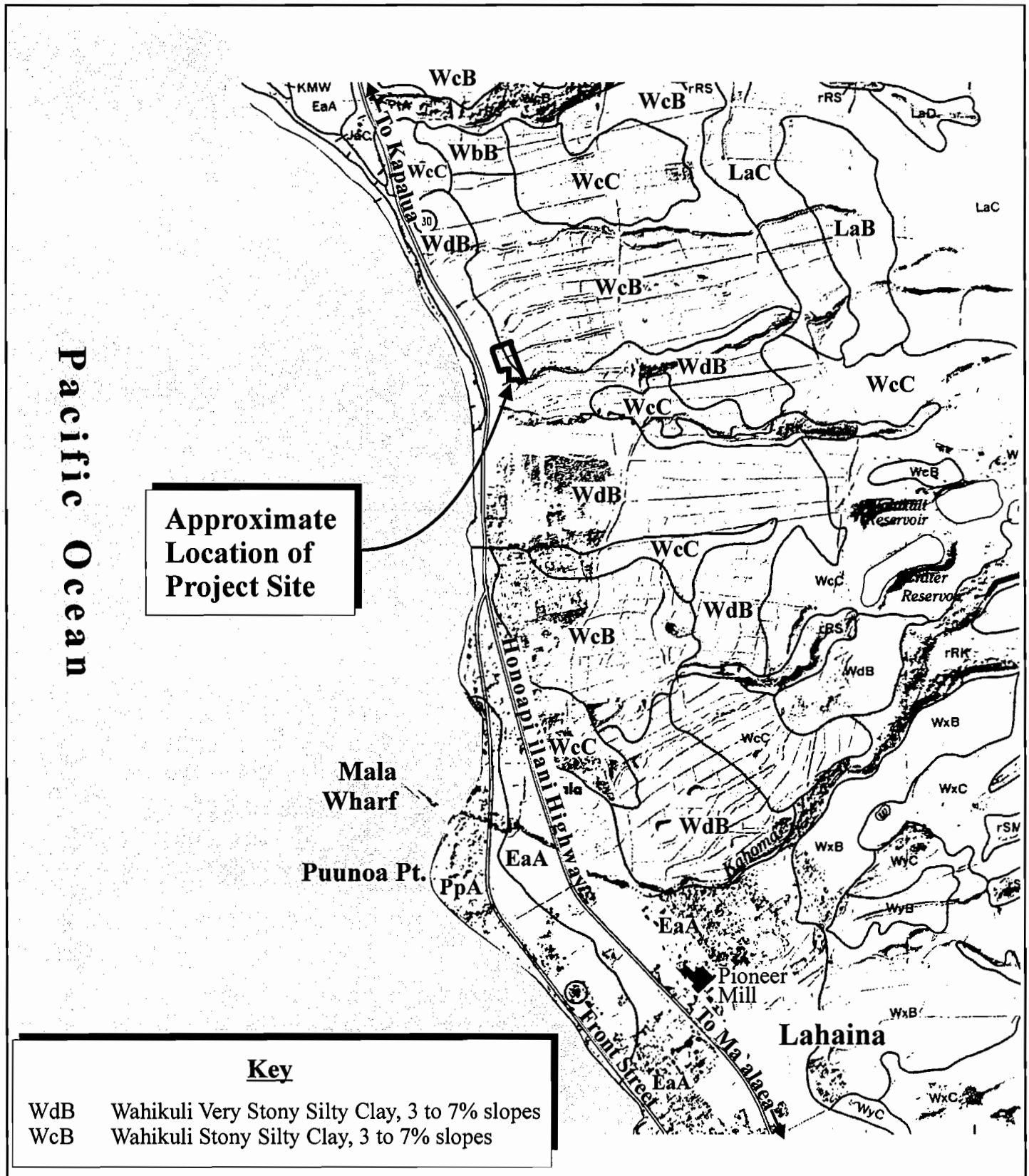
b. Potential Impacts and Proposed Mitigation Measures

The proposed action will require grading to accommodate grade requirements for the new tennis facilities. Cut and fill quantities will be balanced to the extent practicable, with limited alteration to the general topographic conditions at the site. Soil conditions at the site do not pose construction constraints for the project. The proposed project is not anticipated to adversely affect topography and soil characteristics of the area.

4. Agricultural Productivity Considerations

a. Existing Conditions

The lands underlying the subject property were formerly utilized for sugarcane cultivation by Pioneer Mill Company, Ltd.



Source: USDA Soil Conservation Service

Figure 6 Proposed Lahaina Civic Center Tennis Courts Complex Expansion

Soil Classification Map

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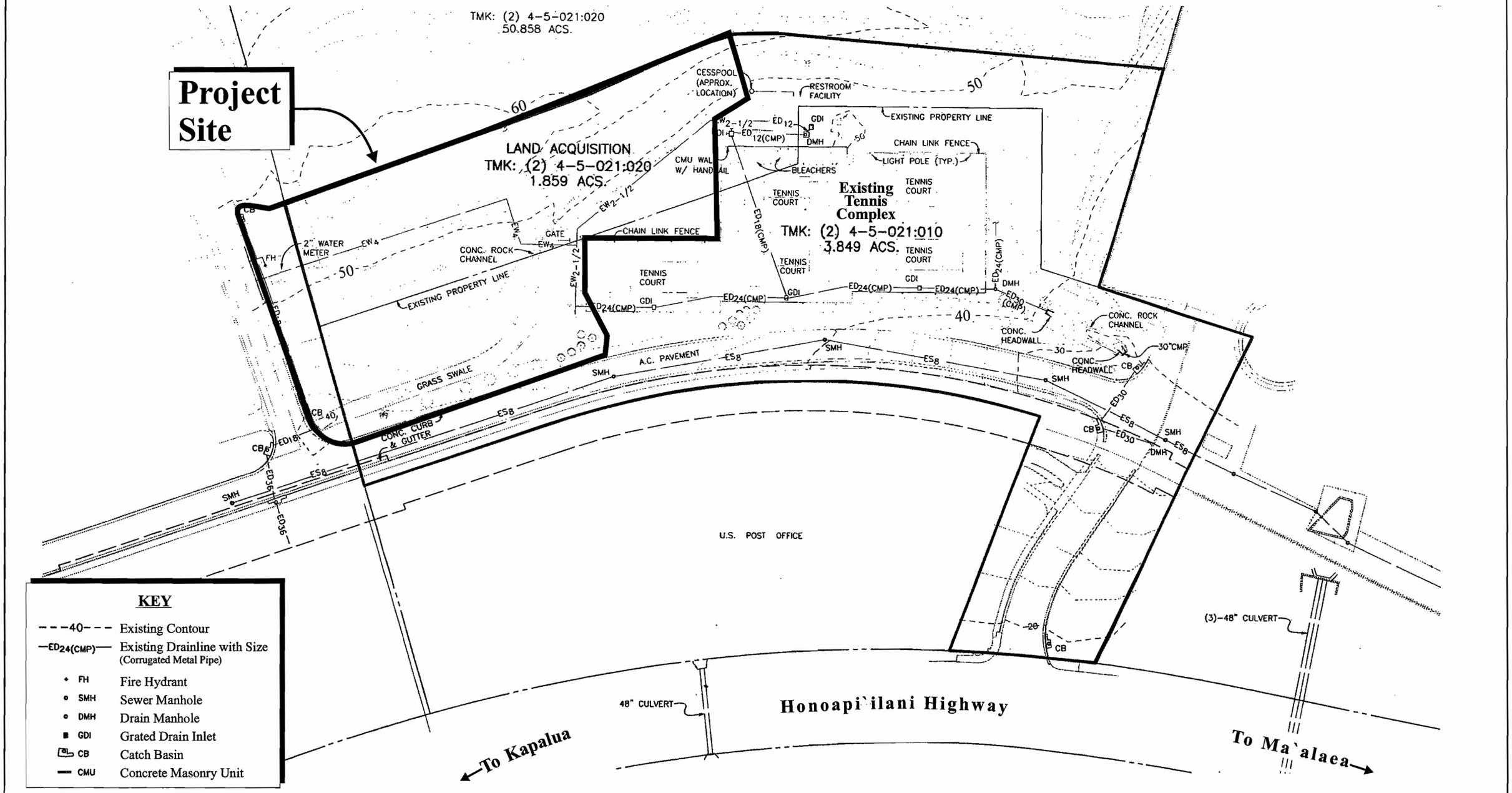

Source: Ronald M. Fukumoto Engineering, Inc.

Figure 7

Proposed Lahaina Civic Center Tennis Courts Complex Expansion

Topographic Map

NOT TO SCALE

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Prepared for: County of Maui, Dept. of Parks and Recreation

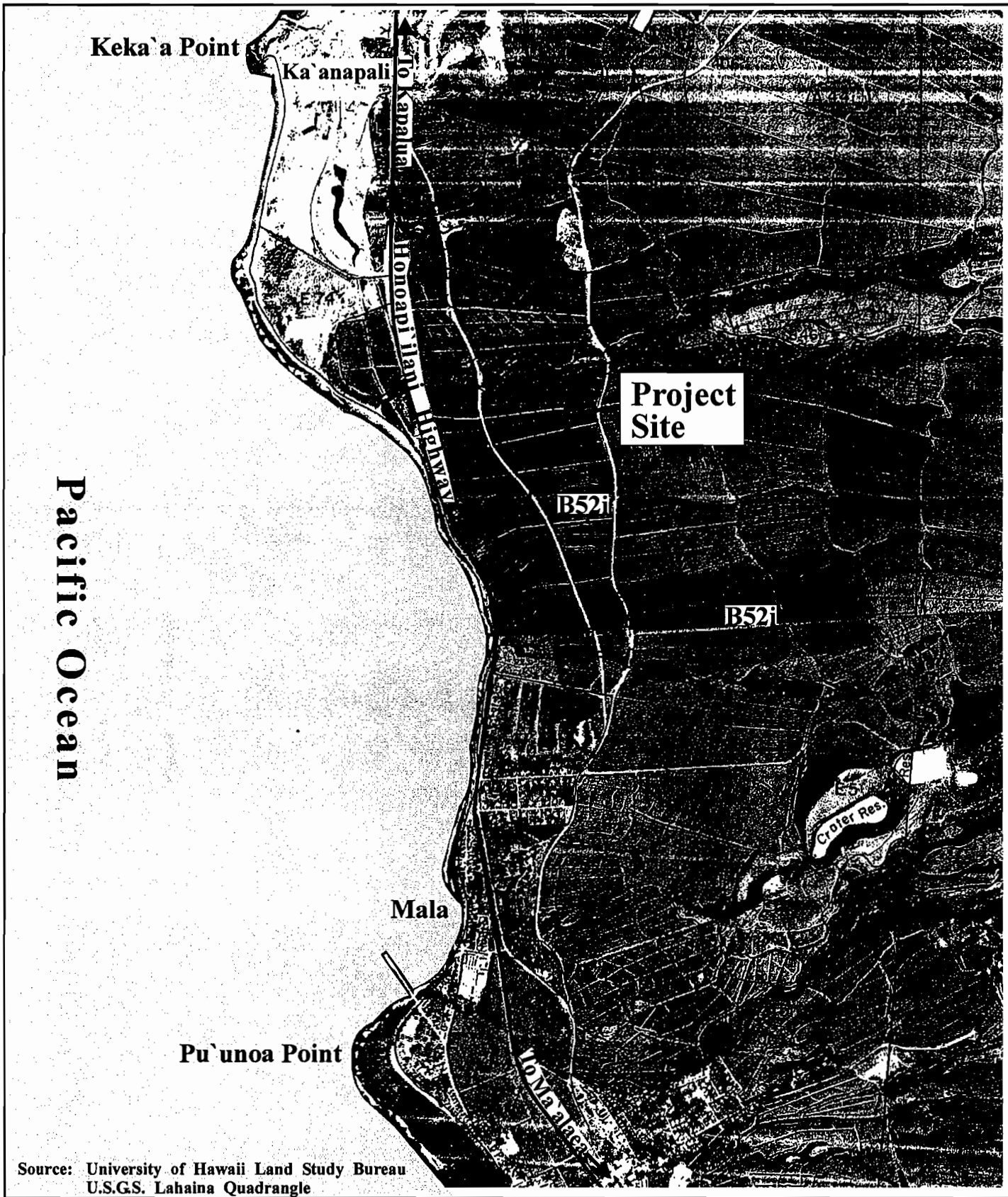
The coastal flatlands and plateaus of the West Maui Mountains are suitable for agricultural crop cultivation. Soils are dark reddish-brown, stony, well-drained, and deep in the areas north of Lahaina, but stony in the areas south of Lahaina. Slopes along the coastal flatlands are level, whereas slopes on the plateaus range from gentle to steeply sloping. These plateaus are typically separated by deep, steep-sided canyons.

With regard to agricultural productivity attributes, the Land Study Bureau classifies lands with a productivity rating of "A" through "E", with "A" reflecting lands with the highest productivity and "E" the lowest. The lands underlying the project site have an overall productivity rating of "B" and reflects land types which are moderately suited for agricultural uses. According to the Land Study Bureau's Detailed Land Classification Map, the project site has been rated B52i. The land type, B52i represents deep, stony, well-drained, fine-textured soils with slopes ranging from 0 to 10 percent and elevations ranging from sea level to 400 feet. See **Figure 8**.

Additionally, the State Department of Agriculture has established three (3) categories of Agricultural Lands of Importance to the State of Hawai`i (ALISH). "Prime" lands are those lands which possess the soil quality, growing season, and moisture supply needed to produce high yields of crops economically and when treated and managed according to modern farming techniques. "Unique" lands have similar crop specific characteristics, while lands rated "Other" are not classified as "Prime" or "Unique", but are of Statewide or local agricultural importance. Lands not rated "Prime", "Unique" or "Other", are "Unclassified". According to the ALISH map, the lands underlying the tennis courts expansion site are "Unclassified", with a small portion along the property's southern edge designated "Prime". See **Figure 9**.

b. Potential Impacts and Proposed Mitigation Measures

The proposed action will involve the use of land which is no longer utilized for agricultural purposes. The acreage encompassed by this land is not considered significant in the context of the total 246,000 acres of State Agricultural district lands on the island of Maui. The use of this land for the proposed project is not anticipated to adversely affect the inventory of lands available for agricultural cultivation, nor is it expected to affect the inventory



Source: University of Hawaii Land Study Bureau
U.S.G.S. Lahaina Quadrangle

Figure 8 Proposed Lahaina Civic Center Tennis Courts Complex Expansion
Land Study Bureau Classification Map

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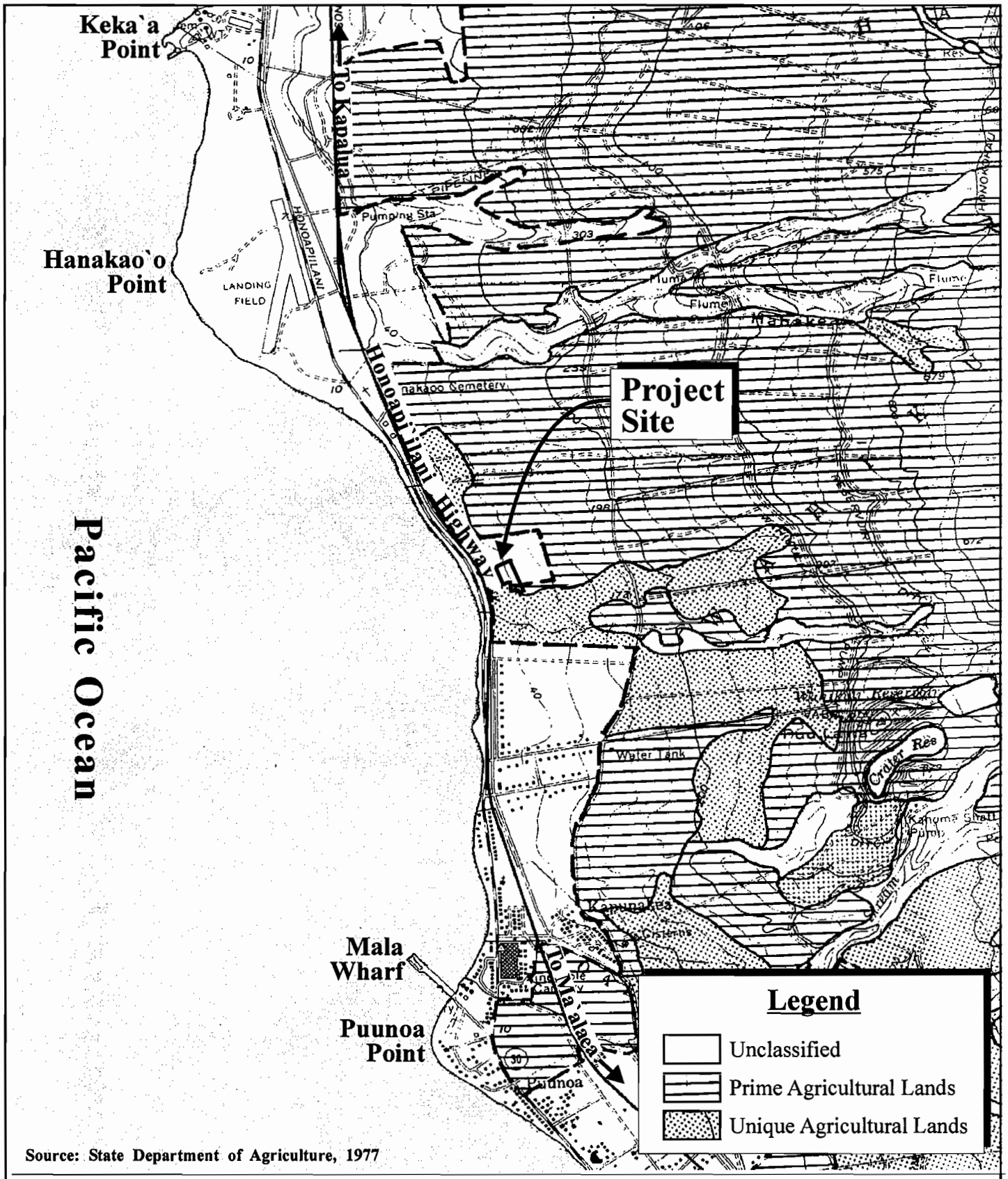


Source: State Department of Agriculture, 1977

Figure 9

Proposed Lahaina Civic Center Tennis Courts Complex Expansion

ALISH Map

0 1000 Feet
500 2000

Prepared for: County of Maui, Dept. of Parks and Recreation

MUNEKIYO & HIRAGA, INC.

RFE/LahainaCC Tennis/ALISH

of land available for diversified agricultural use. In summary, the proposed action is not anticipated to adversely affect agricultural productivity parameters for the island of Maui.

5. Flood and Tsunami Hazards

a. Existing Conditions

The Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) indicates that the project site is located in Zone C, identified as areas of low flood risk and minimal flooding with no development restrictions. See **Figure 10**. Specifically, the Federal Emergency Management Agency (FEMA) describes areas in Flood Zone C as follows:

> Areas outside the 1-percent annual chance floodplain, areas of 1-percent annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1-percent annual chance stream flooding where the contributing drainage areas is less than 1 square mile, or areas protected from the 1-percent annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is not required in these zones.

In addition, the project site is situated in a location which is outside of the tsunami inundation area.

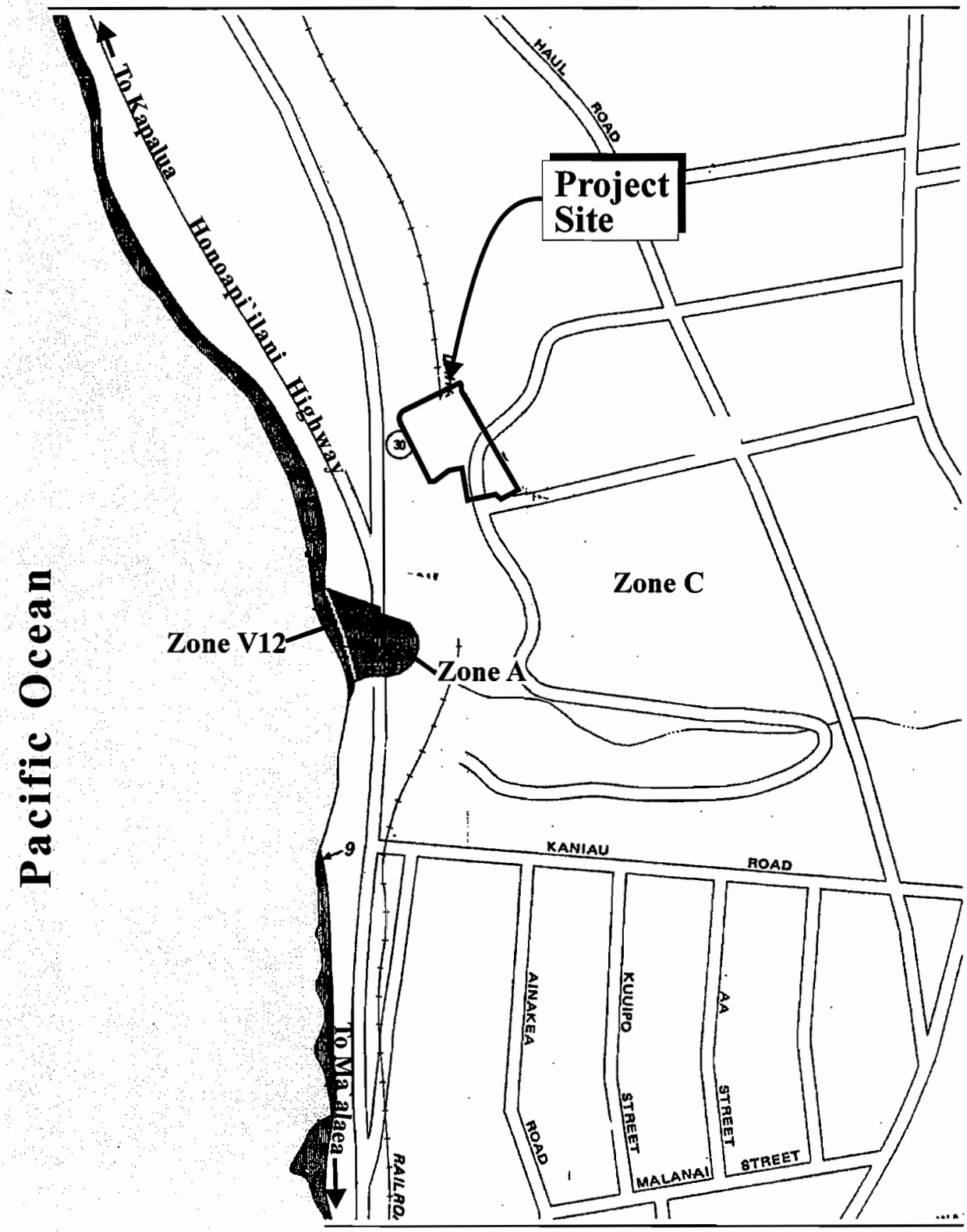
b. Potential Impacts and Proposed Mitigation Measures

The proposed expansion is not located within a flood hazard district and there are no restrictions on development in Flood Zone C. Moreover, the project site is located outside of the tsunami inundation area and tsunami evacuation zone. The proposed action will include onsite drainage improvements in keeping with County of Maui design standards. No adverse impact to flood conditions is anticipated as a result of the proposed expansion.

6. Flora and Fauna

a. Existing Conditions

The Environmental Impact Statement Preparation Notice (EISPN) prepared for the Ka`anapali 2020 Plan (Munekiyo & Hiraga, 2004) contained an area-



Source: Federal Emergency Management Agency, Flood Insurance Rate Map

Figure 10 Proposed Lahaina Civic Center Tennis Courts Complex Expansion
Flood Insurance Rate Map

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wide biological resources survey which identified the vegetation in the immediate vicinity of the subject property to be predominately a weedy mixture of plants commonly associated with agricultural lands. Introduced species of grasses, weeds, shrubs, and trees have occupied the former sugar lands. Strips of vegetation, including haole koa brush and kiawe trees border the Hanakaoo, Wahikuli, and Hahakea Gulches. A few native species, such as the wiliwili, 'ilima, and Kakowakona, are found in the gulch areas.

There are no wetlands located within or in close proximity to the project area as indicated by the U.S. Department of Interior's National Welands Inventory Map.

The feral mammals seen during the field survey and likely to occur in the project area include the mongoose and rats, as well as feral cats and pigs. Avifauna include the Maui Amakihi, Pueo, Black Crowned Night Heron, Pacific Golden Plover, Ruddy Turnstone, Sanderling, and Wandering Tattler. None of these birds are listed as endangered or threatened on Maui.

b. Potential Impacts and Proposed Mitigation Measures

The proposed expansion of the LCC tennis courts complex is not expected to have a negative impact on avifauna, and feral mammal resources. The biological survey revealed that there were no rare, threatened, or endangered species of terrestrial fauna in the project area. None of the plants found in the project area are threatened or endangered species of concern. The applicant will use native vegetation in its landscaping plan for the subject parcels, to the extent practicable, to promote the traditional Hawaiian concept of malama `aina and create a more Hawaiian sense of place. The proposed expansion is not expected to have a significant negative impact on botanical resources.

7. Streams, Wetlands, and Reservoirs

a. Existing Conditions

According to the United States Department of the Interior, Fish and Wildlife Service, National Wetland Inventory Map, there are no wetland features in close proximity to the project site. There are also no streams or other inland water bodies in proximity to the project site.

b. Potential Impacts and Proposed Mitigation Measures

The proposed tennis courts expansion project is not anticipated to have any adverse effects on streams or other natural inland water features in the West Maui region.

8. Air Quality

a. Existing Conditions

There are no point sources of airborne emissions in the immediate vicinity of the project site. Although minimal, airborne pollutants are largely attributable to vehicular exhaust from traffic along Honoapi`ilani Highway and nearby roadways. Windblown dust from fallow fields are another source of indirect emissions in the region. These sources, however, are intermittent and prevailing winds quickly disperse the particulates generated by these temporary sources. Overall, the air quality in the Lahaina region is considered good.

b. Potential Impacts and Proposed Mitigation Measures

In the short term, construction related activities for the proposed LCC tennis courts complex expansion project will be the primary source of airborne pollutants affecting the surrounding area. Site work involving clearing, grubbing, and grading operations will generate fugitive dust. Appropriate Best Management Practices (BMPs) will be utilized to minimize air quality impacts associated with project construction.

The proposed expansion is not an action which will generate adverse long-term air quality impacts.

9. Noise Characteristics

a. Existing Conditions

There are no fixed noise generators in the vicinity of the project site. Existing background noise levels are primarily attributable to vehicular traffic along Honoapi`ilani Highway and aircraft noise from the Kapalua-West Maui

Airport operations. Noise sources within the project area also include large events and concerts from the Lahaina Civic Center.

b. Potential Impacts and Proposed Mitigation Measures

Ambient noise conditions may be temporarily affected by construction activities. Heavy construction machinery, such as backhoes, dump trucks, front-end loaders, paving equipment, and material-transport vehicles are anticipated to be the dominant noise-generating sources during the construction period of the proposed expansion of the LCC tennis courts complex. As applicable, a noise permit will be secured by the contractor pursuant to Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control". Once completed, the proposed project is not anticipated to adversely alter noise conditions at the LCC.

10. Archaeological Resources

a. Existing Conditions

An archaeological field inspection for the project site was conducted by Scientific Consultant Services, Inc. See **Appendix "A"**. The field inspection report notes that the project site has been historically and recently graded and grubbed. The eastern portion of the site contains abundant grasses and *koa haole*, with evidence of modern trash scattered throughout the undeveloped project lands.

The field inspection found no traditional Hawaiian properties at the site, and field observations suggest that there are no readily apparent subsurface cultural deposits.

b. Potential Impacts and Proposed Mitigation Measures

Based on the results of the field inspection and the significant past surface modifications at the property, no further archaeological work is recommended. In this regard, adverse impacts to archaeological resources are not anticipated.

Nonetheless, in the event inadvertent archaeological finds are encountered during construction, work will be halted in the immediate vicinity of the find

and appropriate mitigation protocols implemented in coordination with the State Historic Preservation Division.

11. Cultural Resources

a. Existing Conditions

A cultural impact assessment for the proposed action was prepared in accordance with the Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts. See **Appendix "B"**. The cultural impact assessment establishes a cultural context for the subject area through descriptions of past political boundaries, traditional settlement patterns, legendary places, Lahaina District settlement patterns, the Great Mahele, and historic land uses.

Methodologically, the cultural assessment process also incorporated sending of letters of inquiry to individuals and organizations having cultural resource knowledge and expertise. This process, combined with research on historical and cultural sources was used as a basis for assessing the project's impacts on cultural resources.

b. Potential Impacts and Proposed Mitigation Measures

The cultural impact assessment found that the project area has not been used for traditional cultural purposes in the recent past. Complementary to this finding, the cultural impact assessment notes that there will be no direct adverse effect upon cultural beliefs, including those related to gathering, access or other customary activities. As applicable, consideration will be afforded to any individuals accessing the project area for constitutionally protected and traditional and customary purposes.

According to the Office of Hawaiian Affairs (OHA), portions of Parcels 10 and 16 have been designated as Section 5(b) Ceded Lands, which hold a considerable amount of sentimental, historical and legal significance for Native Hawaiians and OHA. The State holds the Ceded Lands corpus in trust for Native Hawaiians and the general public.

12. Scenic and Open Space Resources

a. Existing Conditions

The West Maui Mountains are visible to the east and provide a scenic backdrop to the project site. The Wahikuli Wayside Park, located makai of Honoapi`ilani Highway, west of the project site, provides a coastal open space and recreational area landscape. The built environment at the LCC includes public/quasi-public buildings and the existing tennis courts complex.

b. Potential Impacts and Proposed Mitigation Measures

The project area is located on slopes mauka of Honoapi`ilani Highway. Design of the proposed LCC tennis courts complex expansion will maintain the urban design character established by surrounding public/quasi-public land uses. Design parameters for the proposed tennis courts complex expansion will establish landscaping details within the site, similar to the existing tennis courts complex at the LCC and adjacent public/quasi-public facilities, to provide visual continuity and buffers from existing adjacent residential uses to the south of the project site. See **Appendix "C"**. The proposed tennis facility expansion project is not anticipated to have an adverse impact on the area's visual resources.

B. SOCIO-ECONOMIC CONDITIONS

1. Land Use and Community Character

a. Existing Conditions

The majority of lands in the West Maui region are designated for either "Conservation" or "Agricultural" use by the State Land Use Commission. Generally, lands designated for "Conservation" and "Agricultural" uses occupy the higher and middle elevations, respectively, while lands designated for "Urban" use are located at the lower elevations along the coast.

Ka`anapali and Kapalua contain Community Plan designations reflective of their resort nature. The communities of Kahana and Napili contain a mixture of resort, residential, and business uses.

Lahaina encompasses a diverse mix of land uses, including residential, business, light industrial, recreational, and agricultural uses. Lahaina Town is the commercial center of West Maui and the former first capital of the State of Hawai`i. Lahaina Town has also been designated as a National Historic Landmark District as the former whaling capital. The town contains several shopping centers and retail business areas, and serves as a hub for the region's residential housing. To the east (mauka) of the Pioneer Mill smokestack in Lahaina, there exists a multitude of single-family homes for island residents.

Part of West Maui's attraction can be attributed to its consistently dry and warm climate, complimented by its many white-sand beaches and scenic landscaped vistas. The vast number of visitor accommodations are located in the town of Lahaina and the resort communities of Ka`anapali, Kapalua, Kahana, and Napili.

The Kapalua-West Maui Airport at Mahinahina provides commuter air services which conveniently link the West Maui region to Oahu and other neighbor islands. The airport is operated by the State Department of Transportation's Airports Division and is located approximately 1.5 miles to the north of the project site.

Pineapple fields and diversified agriculture, such as corn, bananas, melons and papayas, occupy much of the actively cultivated agricultural lands in the West Maui region. Since the closure of its sugar cane cultivation operations in September 1999, Pioneer Mill Company has set aside approximately 1,200 acres of their agricultural lands in Ka`anapali to grow seed corn and coffee. Maui Pineapple Company's pineapple fields span the lowlands below the West Maui Mountains north of Lahaina.

b. <u>Potential Impacts and Mitigation Measures</u>

The project site is situated along the northwestern coast of Maui which includes the residential communities of Lahaina, Honokowai, Kahana, and Napili, as well as the master planned resorts of Ka`anapali and Kapalua.

The proposed expansion of the existing LCC tennis courts complex is needed in the West Maui region in order to provide the community with recreational

facilities sufficient to support continuing growth in population and housing developments in the area. The proposed project will have a positive impact on the accessibility and availability of the current West Maui public recreational facilities. The proposed expansion is not anticipated to adversely alter the community character of West Maui.

2. Population and Demography

a. Existing Conditions

The proposed tennis facility expansion project is located on the mauka side of Honoapi`ilani Highway near the western coast of Lahaina, Maui, within the West Maui Community Plan region.

The County of Maui, specifically the Island of Maui and the West Maui region, has exhibited relatively strong growth over the past decade. In 2000, the population of Maui County was 128,241, compared to a 1990 population of about 100,504 (SMS, June 2006). The resident population of Maui County in 2005 was estimated to be 140,050, and this number is projected to increase to approximately 151,300 in 2010 (SMS, June 2006).

Just as the County's population has grown, the resident population of the Island of Maui has also increased. In 2000, the estimated population of the Island of Maui was 117,644. It is projected that in 2010 the population will reach approximately 140,289 (SMS, June 2006).

West Maui's growth over the last three (3) decades has kept pace with that of Maui County. Since 1970, West Maui has seen an increase in resident population growing from about 5,500 persons in 1970, to approximately 10,300 persons in 1980, to about 14,600 in 1990. In 2000, the resident population of Lahaina was approximately 17,967 (SMS, June 2006). Population forecasts for this region reflect a West Maui population of 21,577 persons in 2010 (SMS, June 2006). Accounting for visitors and workers, the day-time population increases to approximately 50,000 people in the West Maui region.

Age and ethnicity attributes of the West Maui region for the year 2000 are reflected in **Table 3**.

Table 3. Age and Ethnicity

AGE AND ETHNICITY		
	Maui County	**West Maui**
Population	128,094	17,748
Age		
Under 5	7 percent	7 percent
5 to 19	21 percent	17 percent
20 to 44	37 percent	42 percent
45 to 64	24 percent	24 percent
65 and older	11 percent	10 percent
Median Age	36.8 years	39.3 years
Ethnicity		
Caucasian	34 percent	55 percent
Japanese	10 percent	5 percent
Hawaiian	9 percent	6 percent
Filipino	17 percent	13 percent
All Others	30 percent	21 percent
Source: U.S. Census Bureau, 2000.		

West Maui has a larger percentage of its population in the eligible labor force than the County as a whole. As noted in the preceding table, in the year 2000, 66 percent (66%) of West Maui's population is in the labor force age bracket of 20 to 64 years, while Countywide, 61 percent (61%) of the population is in this age category. West Maui has a slightly higher median age of 39.3 years, when compared to the Countywide median of 36.8 years.

b. Potential Impacts and Proposed Mitigation Measures

With nearly 18,000 full-time residents and accounting for the visitor population and a fast-growing population, West Maui has sufficient population to support an expansion of the existing LCC tennis courts complex. Due to the public nature of this recreational facility, the additional tennis courts accessible to residents, non-residents, and visitors are

considered a community benefit. The proposed tennis facility expansion project is not a direct population generator and, as such, is not anticipated to have significant adverse impacts on population or demographic trends of the West Maui region.

3. Labor Force

a. Existing Conditions

In 2000, there were a total of 21,148 civilian jobs in the Lahaina area, of which 4,703 were self-employed jobs. In August, 2008, the non-seasonally adjusted unemployment rate for Maui County and the Island of Maui stood at 4.7 percent and 4.4 percent, respectively, which is a 1.6 percent and 1.4 percent, respectively, increase in the rate from the previous year (State Department of Labor and Industrial Relations, September 2008).

In terms of the profile of employed persons, West Maui generally follows the Countywide trends for the labor force characteristics shown in **Table 4**.

Table 4. Labor Force Characteristics

Occupational Category	Maui County	West Maui
Agriculture	3 percent	2 percent
Manufacturing	2 percent	<1 percent
Construction	4 percent	2 percent
Transportation, Communication, and Utility	4 percent	2 percent
Trade	20 percent	22 percent
Banking & Finance	4 percent	4 percent
Service	31 percent	40 percent
Government	10 percent	4 percent
Self-employed	23 percent	23 percent
Source: SMS, June 2006		

In terms of employment distribution, more West Maui workers were employed in the service industry (40 percent) than the Countywide profile (31

percent). Because of the West Maui's emphasis on service jobs, most other job sectors exhibited slightly lower distribution rates.

b. Potential Impacts and Proposed Mitigation Measures

On a short-term basis, the project will support construction and construction-related employment. This project is not anticipated to have significant negative impacts on labor conditions.

C. PUBLIC SERVICES AND FACILITIES

1. Police and Fire Protection Services

a. Existing Conditions

The project site is within the service area of the Maui Police Department's Lahaina patrol district which services the West Maui region. The Lahaina Police Station is located in the LCC complex, to the north of the project site, and was built in the early 1970's. The Lahaina patrol district includes management level officers, field police officers, and additional personnel, which consists of public safety aides and administrative support staff (Maui Police Department Personnel Roster, May 2008). In addition, there is also a police sub-station in Napili. This sub-station is used to allow officers assigned in the outskirts of Lahaina to write police reports without having to travel back into Lahaina town.

Fire prevention, suppression and protection services for the West Maui region are provided by the County Department of Fire and Public Safety's Lahaina and Napili Fire Stations. The Lahaina Fire Station is to the north of the project site at the LCC, while the Napili Fire Station is located approximately 7.4 miles to the northeast. The Lahaina Fire Station includes an engine and a ladder company, and is staffed by 30 full-time personnel. It also has a boat for ocean rescues. The Napili Fire Station consists of an engine company with 15 full-time firefighting personnel. All firefighting personnel are first-responder trained to provide emergency medical care.

b. Potential Impacts and Mitigation Measures

The applicant has reviewed parking conditions along the service road with members of the Lahaina Fire Station and with the medics and ambulance crews stationed at the LCC. Existing signs have been posted to prohibit parking along the makai (southbound) lane of the existing 28-foot wide service driveway, to provide adequate clearances for emergency vehicles. It is also noted that the additional 25 parking stalls are anticipated to alleviate public parking along the service road. Moreover, public parking and usage of the tennis courts will be monitored, and coordination between agencies to address the parking situation will be ongoing.

The proposed action is not anticipated to affect the capabilities of police and fire services. In addition, the existing operational limits of these services are not expected to be extended or affected.

2. Medical Facilities

a. Existing Conditions

Maui Memorial Medical Center serves as the island's only major medical facility. Located in Wailuku, approximately 25.0 miles southeast of Lahaina, the 231-bed facility provides general, acute, and emergency care services for the island's residents and visitors. In addition, the Kaiser Permanente Medical Clinic, West Maui Healthcare Center, Maui Medical Group, Lahaina Physicians, and other private medical and dental offices provide health care services for the region's residents and visitors.

b. Potential Impacts and Mitigation Measures

The proposed project is not anticipated to adversely affect medical services and delivery capacities in the area. As discussed above, parking has been prohibited along the makai side of the service road, ensuring uninhibited access to Honoapi`ilani Highway for emergency response teams. In addition, coordination between agencies to assess and alleviate parking along the service road will continue.

3. Recreational Facilities

a. Existing Conditions

West Maui has numerous recreational facilities offering diverse opportunities for the region's residents. These facilities include several County and State parks and beach parks in West Maui. Approximately one-third of the County parks are situated along the shoreline and offer excellent swimming, diving, and snorkeling areas. In addition, Ka`anapali and Kapalua Resorts operate world-class golf courses available for public use.

Recreational facilities in Lahaina Town include the Lahaina Aquatic Center, the West Maui Youth Center, the Lahaina Recreation Center, and the LCC. The Lahaina Aquatic Center contains an Olympic-size swimming pool, a children's wading pool, a paved parking lot and office and storage space, as well as shower, restroom and changing room facilities. The 15-acre Wainee Park expansion, includes new fields, parking and washroom facilities. The West Maui Youth Center has a building for youth activities, as well as paved parking, an outdoor playground and a basketball court. The Lahaina Recreation Center includes baseball fields and playfields for soccer and football, as well as restrooms and paved parking facilities. The LCC includes a gymnasium, amphitheater and tennis courts complex, as well as restrooms and paved parking facilities. Refer to **Figure 4.**

Additionally, the clear ocean waters and well-developed reef system along the Lahaina and Ka`anapali coastline offer many recreational opportunities for residents and visitors. Many tourism-based businesses also rely on the ocean and reef system for their operation.

Fishing by shorecasting and netting is practiced in the ocean waters near Lahaina Town, Ka`anapali Beach, Hanakaoo Point and Honokowai Point. Edible seaweed collecting, octopus fishing and spearfishing occur on the adjacent reef flat fronting Ka`anapali. During periods of wave activity, the area is a good location for surfing.

b. Potential Impacts and Mitigation Measures

The proposed expansion of the tennis courts complex at LCC will provide residents with accessibility to more public recreational facilities in the West Maui region. This project is viewed as a community benefit for island residents.

4. Educational Facilities

a. Existing Conditions

The West Maui region is served by four (4) public schools (Lahainaluna High School, Lahaina Intermediate School, Princess Nahi`ena`ena Elementary School, and Kamehameha III Elementary School) operated by the State of Hawai`i, Department of Education (DOE) and two (2) smaller private schools (Sacred Hearts School and Maui Preparatory Academy). All four (4) of the public schools are located within Lahaina town and three (3) of those schools are located along Lahainaluna Road, mauka of Honoapi`ilani Highway. The enrollments in the four (4) public schools have grown in concert with the growth of residential development in the area. See **Table 5**.

Table 5. Actual and Projected Enrollments at Department of Education Schools

	Capacity	Actual Enrollment		Projected Enrollment					
School	SY 05-06	SY 04-05	SY 05-06	SY 06-07	SY 07-08	SY 08-09	SY 09-10	SY 10-11	SY 11-12
Lahainaluna High School	969	1,038	1,033	1,000	907	810	765	762	796
Lahaina Intermediate	571	637	578	596	565	581	545	500	490
Kamehameha III Elementary	646	702	744	766	817	869	958	1,033	1,077
Princess Nahi`ena`ena Elementary	612	664	598	630	620	617	636	651	653

Source: Department of Education, 2006.

Maui Community College (MCC), which is located in Kahului, is a branch of the University of Hawai`i system. In addition, there is an MCC-Lahaina

Education Center that opened in Fall 2007. MCC is the primary higher education institution serving Maui.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project is not a direct population generator and, as such, is not anticipated to impact educational facilities in the region.

5. Solid Waste Collector and Disposal Services

a. Existing Conditions

Residential refuse collection is provided by the County's Department of Environmental Management, Solid Waste Division. Private refuse collectors provide solid waste disposal services for commercial and institutional accounts. With the exception of the Hana region, residential and commercial solid waste from throughout the island is transported to the Central Maui Landfill at Puunene, about 30.0 miles to the southeast of the project site.

A refuse transfer station located at Olowalu, approximately 8.0 miles south of the project site, accepts household and green wastes, as well as used oil, for transport to the Central Maui Landfill in Puunene. The disposal of commercial and institutional refuse is not permitted at the Olowalu transfer station.

b. Potential Impacts and Mitigation Measures

As applicable, a solid waste management plan will be developed for the disposal of materials resulting from the site and construction activities. Once completed, it is anticipated that the project will be served by the County's solid waste collection service. Currently, the County of Maui's Solid Waste Division is in the process of completing a landfill expansion project, estimated to provide the island with sufficient capacity for several years, which takes into account future growth of residential and non-residential uses. In addition, lands adjacent to the existing landfill are currently utilized for rock quarrying and will likely be available for County expansion of the landfill, further increasing available capacity.

The proposed action is not anticipated to adversely impact solid waste collection and disposal capabilities and capacities.

D. INFRASTRUCTURE

1. Existing Roadway Infrastructure

a. Existing Conditions

Vehicular access to the proposed expansion of the LCC tennis courts complex will be provided via Leali`i Parkway and its intersection with Honoapi`ilani Highway.

Direct vehicular access to the proposed expansion will be provided via West Perimeter Road and South Access Road, through the additional 25-stall paved parking lot that is included in the site plans for the tennis courts complex expansion. Refer to **Figure 3**. The parking lot will be located on the south side of South Access Road and east of West Perimeter Road. The South Access Road runs perpendicular to Honoapi`ilani Highway and intersects with West Perimeter Road on the east side. West Perimeter Road runs parallel to Honoapi`ilani Highway and intersects with Leali`i Parkway to the north.

Access to the Lahaina region is provided by Honoapi`ilani Highway from Central (Wailuku/Kahului) and South (Kihei/Wailea) Maui. Extending from Wailuku to Kapalua, Honoapi`ilani Highway is the only State highway serving the West Maui region. With the exception of a four-lane segment from Lahainaluna Road to Lower Honoapi`ilani Road, the typical highway section consists of two (2) lanes bordered by paved shoulders which also function as bike routes.

b. Potential Impacts and Mitigation Measures

A traffic impact assessment report (TIAR) for the proposed action was prepared by Phillip Rowell and Associates. See **Appendix "D"**. The TIAR examined existing levels of service at the Honoapi`ilani Highway-Leali`i Parkway intersection, Honoapi`ilani Highway-Front Street intersection, and the Honoapi`ilani Highway-Ka`anapali Parkway intersection. As reflected in Table 3 of **Appendix "D"**, these intersections operate at levels of service "A", "B", and "D", which are considered acceptable operating thresholds.

To establish a buildout year level-of-service basis of analysis, trip generation for the proposed new tennis courts were calculated and added to projected year 2010 background traffic. Trip generation for the tennis courts are estimated at three (3) inbound and four (4) outbound trips during the morning peak hour. During the afternoon peak hour, the proposed tennis expansion project would generate eight (8) inbound trips and eight (8) outbound trips. Based on the analysis set forth in the TIAR, the following conclusions have been advanced.

1. The intersection of Honoapi`ilani Highway at Leiali`i Parkway will operate to Level-of-Service "C" during the morning peak hour and Level-of Service "D" during the afternoon peak hour, without and with project generated traffic. There is no change of level-of-service of any movement as a result of project generated traffic.

2. The intersection of Honoapi`ilani Highway at Front Street will operate at Level-of-Service "B" during the morning peak hour and Level-of-Service "D" during the afternoon peak hour, without and with project generated traffic. There is no change of level-of-service of any movement as a result of project generated traffic.

3. The intersection of Honoapi`ilani Highway at Ka`anapali Parkway will operate at Level-of-Service "C" during the morning peak hour and Level-of-Service "F" during the afternoon peak hour, without and with project generated traffic. There is no change of level-of-service of any movement as a result of project generated traffic.

In summary, the proposed action is not expected to adversely impact traffic operating conditions at key intersection in vicinity of the project site.

2. Water

a. Existing Conditions

The West Maui region is served by the County's Department of Water Supply domestic water system. The County water system services the coastal areas from Launiupoko to Ka`anapali and from Honokowai to Napili. The County's system includes two (2) surface and nine (9) groundwater sources.

The sources of water for Lahaina are four (4) deepwells located above Alaeloa and referred to as Napili Wells 1, 2, and 3, and Honokohau Well A.

These wells are supplemented by water treatment plants above Honokowai and Lahainaluna High School that draw surface water from the Honolua Ditch and Kanaha Valley. Several miles of 12- and 16-inch lines located in Lower Honoapi`ilani Road and two (2) in-line booster stations convey water from these sources to consumers in Lahaina. Storage is provided by a 1.5 million gallon (MG) storage tank above Wahikuli and a 1.0 MG tank on Lahainaluna Road.

The County of Maui provides water service for the LCC. The existing distribution system within the LCC site includes 8-inch lines and fire hydrants. Existing water laterals tap into these main lines and serve various buildings and areas within the civic center. An existing 2-inch meter serves the existing tennis court restroom and surrounding areas. See **Appendix "E"**.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project is not anticipated to require any substantial potable water usage over that which is currently being used at the project site. Included in the site plans are the relocating of the existing water meter, rerouting of existing water service lines between the water meter and the existing restroom, and installing a new irrigation system within the graded area. According to the Preliminary Engineering Report (PER) prepared by Ronald M. Fukumoto Engineering, Inc. (RFE), the total water usage attibutable to the project will be reduced by 2,100 gallons per day or about 11 percent of the current usage. This reduction is due to an overall reduction in irrigation requirements. Therefore, a positive outcome as it relates to the water supply is anticipated as a result of the proposed action.

There are no potential impacts to State waters associated with the project identified at this time. Nonetheless, the project will be implemented in a manner which ensures strict compliance with Chapter 11-54, Hawai`i Administrative Rules. BMPs will be implemented during the construction of the proposed project towards ensuring the protection of the Wahikuli State Wayside Park water body, which is located on the makai (east) side of Honoapi`ilani Highway.

3. Wastewater Systems

a. Existing Conditions

The County of Maui, Department of Environmental Management, Wastewater Reclamation Division provides sanitary sewer service for the West Maui region.

Wastewater from the Ka`anapali and Lahaina areas is treated at the County's Lahaina Wastewater Reclamation Facility (WWRF), which is part of the project site. The WWRF's potential total treatment capacity is 9.0 million gallons per day (mgd), with 6.0 mgd for secondary treatment and 3.0 mgd for R-1 treatment. Presently, the facility treats about 5.4 mgd of wastewater. About 1.2 mgd of the R-1 treated effluent is used to irrigate the Royal Ka`anapali golf courses, the landscaped areas along Honoapi`ilani Highway, and the landscaped median of Ka`anapali Parkway. The remaining treated effluent (4.2 mgd) is disposed into four (4) injection wells located within the facility. Under the conditions of its Environmental Protection Agency (EPA) permit, the County is allowed to dispose a maximum flow of 6.7 mgd into the injection wells.

A newly constructed gravity sewerline is located within the LCC site along the LCC driveway, across the adjoining DHHL site. This sewerline connects to an existing sewerline which carries the wastewater to the County of Maui collection system within Honoapi`ilani Highway.

b. Potential Impacts and Proposed Mitigation Measures

The average wastewater flow rates for the project area were estimated using County of Maui Standards. The total projected wastewater flows generated by the proposed LCC tennis courts complex expansion is approximately 900 gallons per day. Combined with the existing wastewater demand for the five (5) existing tennis courts, the total projected wastewater flow from the tennis facility is 2,025 gallons per day. Refer to **Appendix "E"**.

Adverse impacts to wastewater collection, treatment and disposal capacities are not anticipated from the proposed action.

4. Drainage

a. Existing Conditions

The project site gently slopes down from east to west with site elevations ranging from approximately 40 feet to 60 feet above mean sea level. The steepest areas are the easterly and southwesterly ends with slopes that range from about 20 to 40 percent. The flattest areas are at the northwesterly end of the site with slopes that range from about 4 to 8 percent.

Existing onsite drainage improvements include catch basins and inlets which collect storm runoff from the site; drain pipes, channels, and swales which carry the collected runoff to the makai side of the site; and manholes and outlet structures.

Two (2) separate drainageways route the onsite and offsite flows through the site from the easterly side of the site to the northwesterly and southwesterly corners of the project site. The surface runoff from the project site is conveyed through a culvert under Honoapi`ilani Highway and under the Wahikuli Wayside Park, ultimately discharging into the Pacific Ocean. Refer to **Appendix "E"**.

b. Potential Impacts and Mitigation Measures

The proposed expansion will only affect the existing drainage improvements located at the easterly side of the site. The proposed drainage improvements include swales, inlets, manholes, drain pipes, and a subsurface detention/retention basin and will consist of two (2) separate parts corresponding to onsite and offsite flows.

Maui County drainage standards require the use of a 50-year, 1-hour rainfall for computing volumes and rates of flow. Due to the location of the project site, further guidelines are imposed by the West Maui Watershed Management Advisory Committee which include the maintenance of pre-development runoff volumes for a 2-year, 24-hour storm and pre-development peak flow rates for a 50-year, 1-hour storm. In accordance with the Maui County Rules for the Design of Storm Drainage Facilities, the proposed drainage system will be designed to handle a storm with a

recurrence interval of 50 years. The hydrologic design data, which shows the runoff volumes and peak flow rates for the proposed improvements, indicates an increase compared to the existing conditions. However, the runoff rate and volume will be mitigated by the construction of the drainage/retention basin. Refer to **Appendix "E"**.

Since peak flow rates and runoff volumes will be maintained at pre-development levels, the proposed expansion, including the on-site drainage improvements, is not anticipated to adversely affect the adjacent or downstream properties. In particular, the design of the drainage improvements will ensure that no additional runoff will flow onto Honoapi`ilani Highway.

Applicable National Pollutant Discharge Elimination System (NPDES) general permits will be obtained prior to construction.

If applicable, a Notice of Intent (NOI) will be submitted for review by the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources. The applicant will submit a copy of its request for review by SHPD or SHPD's determination letter for the project along with the NOI or NPDES permit application, as applicable.

All discharges related to project construction or operation activities will comply with the applicable State Water Quality Standards as specified in HAR, Chapter 11-54 and/or permitting requirements as specified in HAR, Chapter 11-55. Discharges will be kept to a minimum through the application of engineering BMPs.

5. Electrical, Telephone, and Cable Television Systems

a. Existing Conditions

Electrical, telephone, and cable television services for the West Maui region are provided by Maui Electric Company, Ltd., Hawaiian Telcom, and Oceanic Time Warner Cable Company, respectively. These distribution systems consisting of underground and overhead lines are located along Honoapi`ilani Highway.

b. Potential Impacts and Mitigation Measures

The electrical improvements for this project include new lighting for the four (4) additional tennis courts, parking lot, and walkways. The requirements of the proposed improvements will be discussed with Maui Electric Company, Ltd. during the design phase and prior to the commencement of construction.

In order to ensure that electrical demand requirements can be addressed in a timely manner, the Department of Parks and Recreation design team will continue to work with Maui Electric Company, Ltd. In this connection, coordination with the Demand Side Management group will be undertaken, as needed, to facilitate utilization of energy conservation measures.

There are no improvements in the telephone and cable television services planned for this proposed expansion.

In summary, the proposed action is not anticipated to have an adverse impact on existing electrical, telephone or cable television systems, nor is it expected to extend existing service area limits.

III. RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

III. RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Chapter 205, Hawai`i Revised Statutes (HRS), relating to the Land Use Commission, establishes four (4) major land use districts in which all lands in the state are placed. These districts are designated as "Urban", "Rural", "Agricultural", and "Conservation". The subject property is located within the "Urban" district. See **Figure 11**. The proposed LCC tennis courts complex expansion is a permitted use within the "Urban" designation.

B. HAWAI`I STATE PLAN

Chapter 226, HRS, also known as the Hawai`i State Plan, is a long-range comprehensive plan which serves as a guide for the future long-term development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. Examples of State objectives and policies relevant to the proposed project are as follows:

1. **Section 226-14, Objective and policies for facility systems – in general. To achieve this objective, it shall be State policy to:**

    a. Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

    b. Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.

    c. Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.

2. **Section 226-23 Objective and policies for socio-cultural advancement--leisure. To achieve this leisure objective, it shall be State policy to:**

    a. Foster and preserve Hawaii's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.

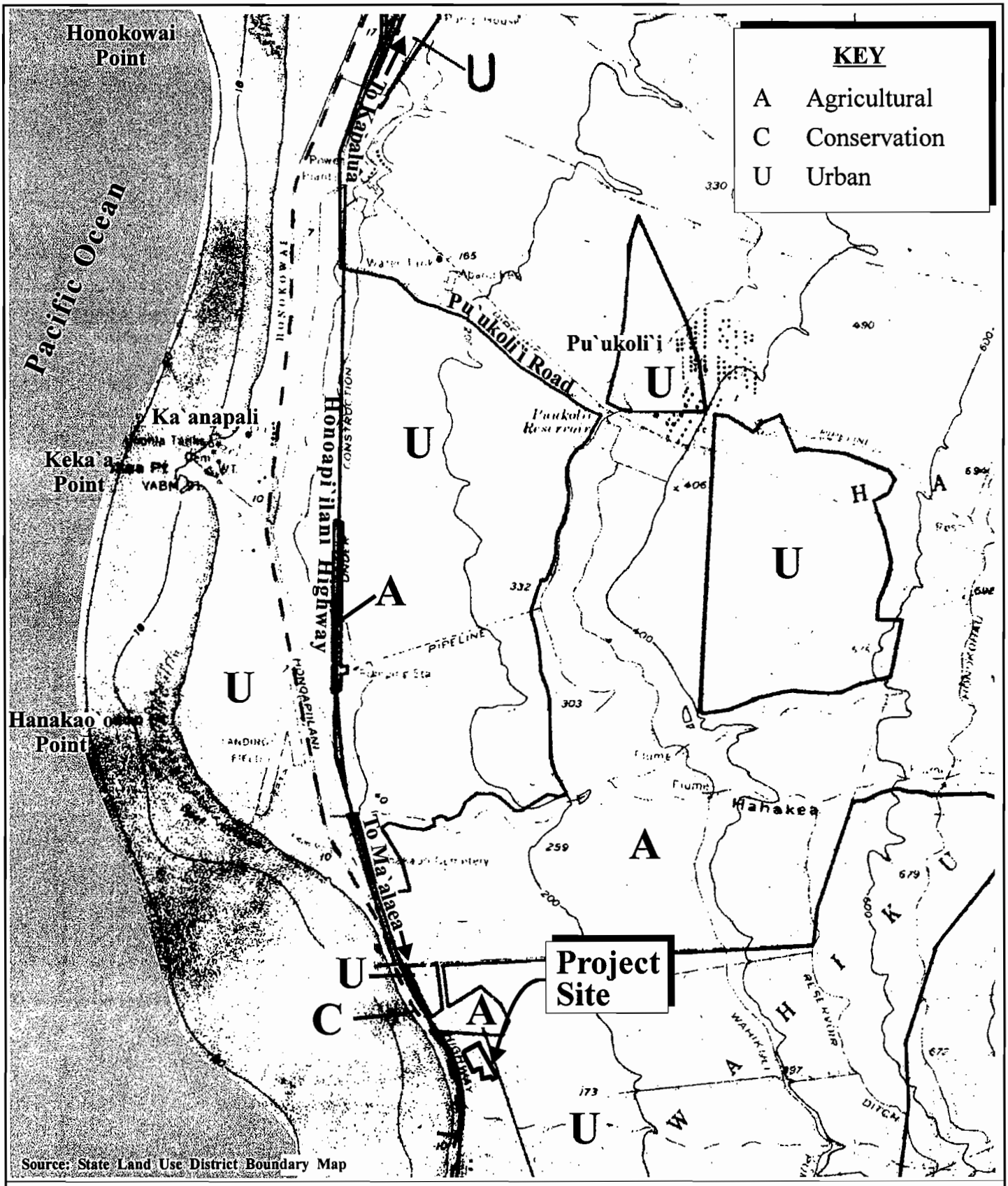


Figure 11 Proposed Lahaina Civic Center Tennis Courts Complex Expansion

Existing State Land Use Classification

NOT TO SCALE

Prepared for: County of Maui, Dept. of Parks and Recreation

MUNEKIYO & HIRAGA, INC.

RFE/LahainaCC Tennis/SLUC

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

c. Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.

d. Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.

e. Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.

The objective of the proposed project is to provide access to additional recreational tennis court facilities which respond to the public's need for these facilities. The proposed expansion of the LCC tennis courts complex will ensure that there is sufficient availability and access to these recreational facilities to meet the existing demand for tennis court facilities in the region. This recreational facility expansion will be developed in accordance with applicable parks standards. In this regard, the proposed project is consistent with the goals, objective, policies, and priorities of the Hawai`i State Plan.

C. 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 General Plan shall:

> *". . . indicate desired population and physical development patterns for each island within the county; shall address the unique problems and needs of each island and region within the county; shall explain the opportunities and the social, economic, and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns, and characteristics of future developments. The general plan shall identify objectives to be achieved, and priorities, policies and implementing actions to be pursued with respect to population density, land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design and other matters related to development."*

The proposed action is in keeping with the following General Plan objectives and policies.

PUBLIC UTILITIES AND FACILITIES

Objective

- To improve the quality and availability of public facilities throughout Maui County.

Policies

- Continue the development of community centers throughout the County.
- Seek improvement in the maintenance and operation of public facilities.
- Encourage the development of public facilities which will be architecturally and ecologically compatible with their surroundings and foster community development.

SOCIAL INFRASTRUCTURE

Objectives

- To provide high-quality recreational facilities to meet the present and future needs of our residents of all ages and physical ability.
- To provide a wide range of recreational, cultural and traditional opportunities for all our people.

Policies

- Maintain and upgrade existing recreational facilities to meet the community needs.
- Maintain recreational facilities for both active and passive pursuits.
- Develop facilities that will meet the different recreational needs of the various communities.
- Develop multipurpose recreational facilities.
- Encourage the transfer of underutilized State and Federal land to the County for public recreation and cultural use.

- Publicize the availability of the County's recreational programs and facilities.
- Encourage the use of public facilities for both cultural and recreational activities.
- Support Federal, State and County and community initiatives to preserve open space, expand recreational facilities and provide after school programs for youth.
- Encourage the use of public lands to expand and enhance outdoor recreational and cultural opportunities.

The proposed project will improve the conditions of the existing recreational tennis court facilities in the West Maui region and will ensure that there are sufficient recreational facilities to accommodate population growth in accordance with the West Maui Community Plan. In the process of expanding the LCC tennis courts complex, potential impacts to the County's unique environmental resources will be minimized. The proposed expansion is in accordance with the objectives and policies of the Maui County General Plan.

D. WEST MAUI COMMUNITY PLAN

Within Maui County, there are nine (9) community plan regions. From a General Plan implementation standpoint, each region is governed by a community plan which sets forth desired land use patterns, as well as goals, objectives, policies, and implementing actions for a number of functional areas including infrastructure-related parameters.

The project site is located within the West Maui Community Plan region and is designated "Public/Quasi-Public" and "Agricultural" in the community plan. See **Figure 12**. The proposed project is in keeping with, among others, the following goals, objectives, and policies of the West Maui Community Plan.

LAND USE

Goal

An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for the stable social and economic well-being of residents and the preservation and enhancement of the region's open space areas and natural environmental resources.

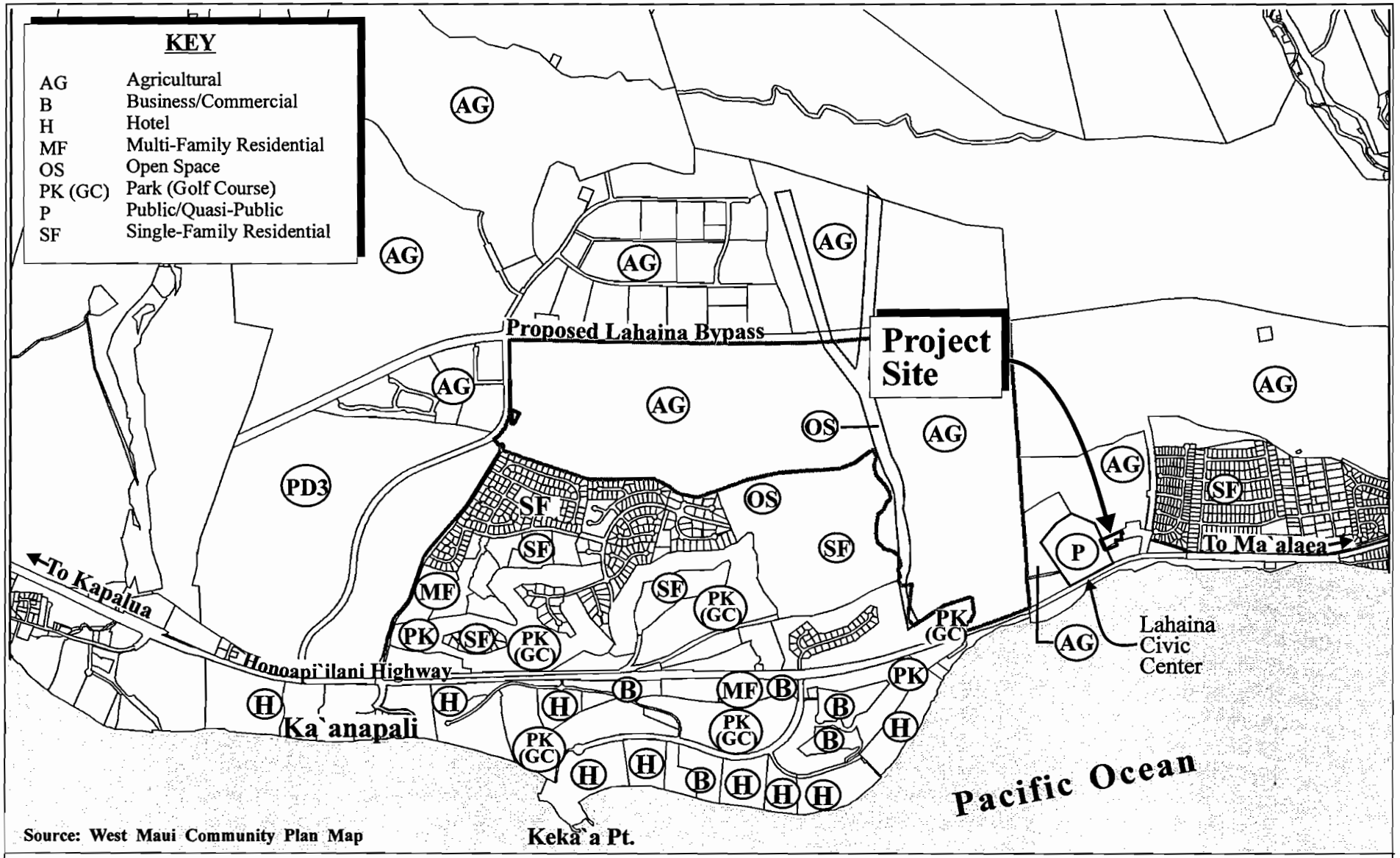


Figure 12

Proposed Lahaina Civic Center Tennis Courts Complex Expansion

West Maui Community Plan Land Use Map

NOT TO SCALE

Prepared for: County of Maui, Dept. of Parks and Recreation

MUNEKIYO & HIRAGA, INC.

RFE/LahainaCC Tennis/CPLU

Objectives and Policies

- Preserve and enhance the mountain and coastal scenic vistas and the open space areas of the region.

- Establish an appropriate supply of urban land within the region to meet the needs of the community over the next 20 years. The Community Plan and its map shall define the urban growth limits for the region and all zoning requests and/or proposed land uses and developments shall be consistent with the West Maui Community Plan and its land use map.

SOCIAL INFRASTRUCTURE

Goal

Develop and maintain an efficient and responsive system of public service which promotes a safe, healthy, and enjoyable lifestyle, and offers opportunities for self improvement and community well being.

Objectives and Policies

- Provide adequate community-oriented park facilities including facilities for field and court games, children's play, and picnicking within, or adjacent to, existing and future residential areas at the following existing or planned park sites:

  a. Wainee area near the existing swimming pool and youth center.

  b. Major residential projects.

  c. Napili.

- Provide urban park space for passive activities which allow respite from shopping and sightseeing activities within Lahaina town.

- Support programs to enhance youth-oriented recreational opportunities such as Malu-ulu-olele Park, and the West Maui Youth Center.

- Encourage the expansion of community and social service facilities and programs in West Maui in convenient and accessible locations through public and private partnerships.

GOVERNMENT

Goal

Coordinate and direct future public and private development, including capital improvement projects, consistent with the Community Plan and the island-wide directed and managed growth plan required by the General Plan.

Objectives and Policies

- Coordinate and direct future public and private development, including capital improvement projects, consistent with the Community Plan and the island-wide directed and managed growth plan required by the General Plan.
- Insure that adequate infrastructure is or will be available to accommodate planned development.
- Improve the availability of government services to the community.

As noted, the proposed project is in conformance with various goals, objectives, and policies of the West Maui Community Plan. The project will be undertaken to satisfy the current and future demands of recreational facilities, specifically tennis courts, in the West Maui region. Moreover, the proposed expansion of the LCC tennis courts complex is consistent with the underlying "Agriculture" and "Public/Quasi-Public" community plan designations.

E. COUNTY ZONING

The lands underlying the project sites are zoned "Agricultural" by Maui County zoning. According to Maui County Code Section 19.30A.050, parks for public use, not including golf courses and not including commercial uses except when under the supervision of a government agency in charge of parks and playgrounds, are allowed uses within the "Agricultural" zoning district. Therefore, the proposed project is in conformance with the underlying Maui County zoning designations.

F. COASTAL ZONE MANAGEMENT/SPECIAL MANAGEMENT AREA

The Hawai`i Coastal Zone Management Program (HCZMP), as formalized in Chapter 205A, HRS, establishes objectives and policies for the preservation, protection, and restoration of natural resources of Hawai`i's coastal zone. The proposed project site is located within the

County of Maui's Special Management Area, thus, consideration of County coastal zone objectives and policies will be carried out. See **Figure 13**.

As set forth in Chapter 205A, HRS, and the rules of the Maui Planning Commission, this section addresses the project's relationship to applicable coastal zone management considerations.

1. Recreational Resources

Objective

Provide coastal recreational opportunities 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:

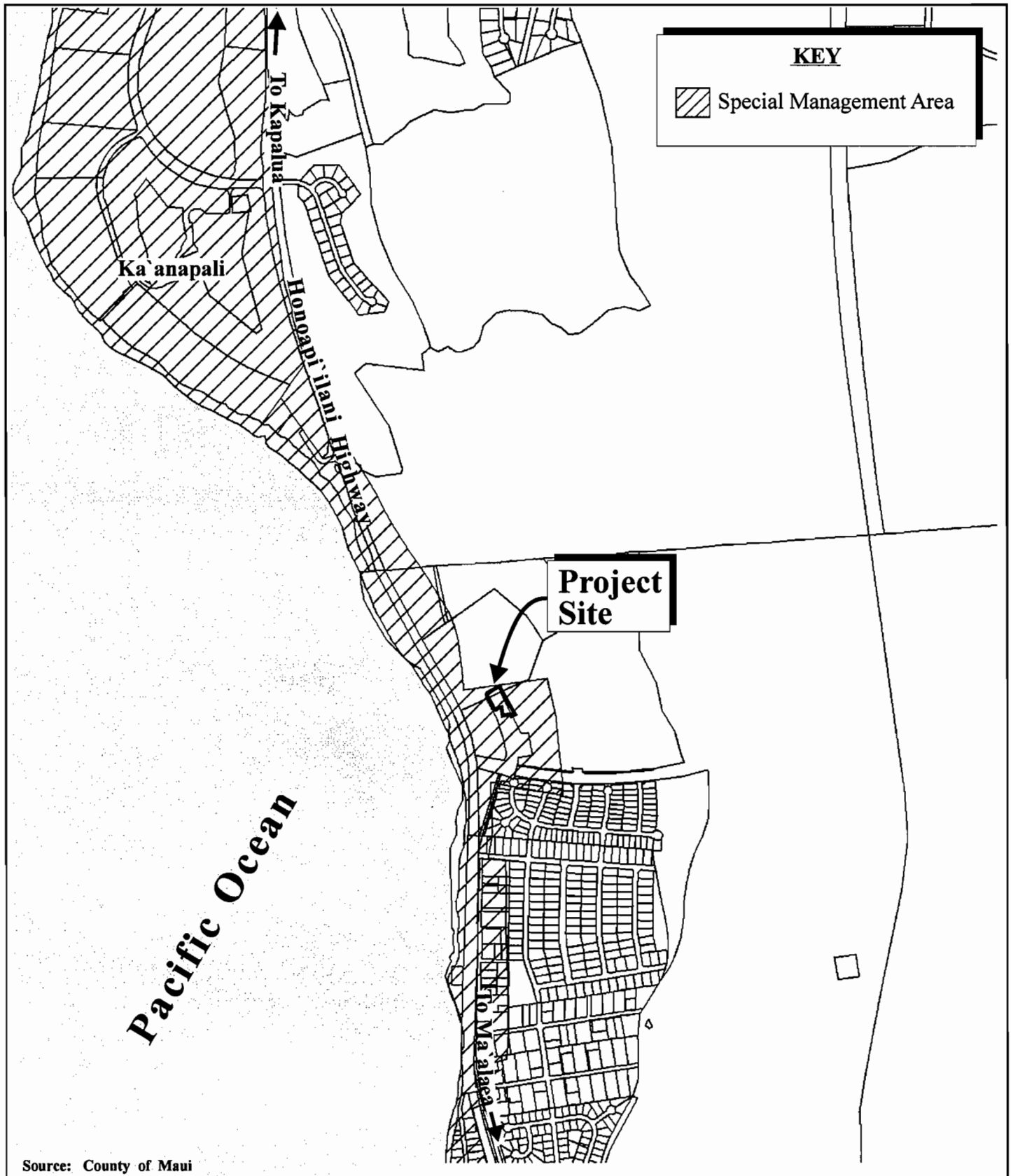
(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

(ii) Requiring replacement of coastal resources having significant 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;

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

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

(v) 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;



Source: County of Maui

Figure 13 Proposed Lahaina Civic Center Tennis Courts Complex Expansion SMA Boundary Map

NOT TO SCALE

Prepared for: County of Maui, Dept. of Parks and Recreation

MUNEKIYO & HIRAGA, INC.

RFE/LahainaCC Tennis/SMA

(vi) 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;

(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

(viii) 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, and county authorities; and crediting such dedication against the requirements of Section 46-6, HRS.

Response: The proposed action is considered an important element in enhancing recreational opportunities in West Maui. There are no adverse effects to coastal-related recreational facilities resulting from the project.

2. **Historic Resources**

Objective

Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area 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: An archaeological field inspection was undertaken for the subject property. There were no historic or cultural features identified at the property. Refer to **Appendix "A".** However, in the event archaeological features are inadvertently encountered during construction, work will stop in the immediate vicinity of the find and applicable mitigation protocols will be initiated in coordination with the State Historic Preservation Division.

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 landforms 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 project site is not located within a significant coastal view corridor. The proposed improvements, sited within and between existing public buildings and facilities, are not anticipated to have an adverse impact on shoreline views or 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) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

(B) Improve the technical basis for natural resource management;

(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

(D) 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

(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Response: With implementation of Best Management Practices (BMPs), the proposed project should not have adverse effects on downstream coastal ecosystems.

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:

(i) Use of presently designated locations is not feasible;

(ii) Adverse environmental effects are minimized; and

(iii) The development is important to the State's economy.

Response: Short-term employment opportunities during project construction will be generated, and there will be no significant, adverse economic impacts associated with the proposed project. Further, the proposed action is not contrary to the objective and policies for economic use.

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, hurricane, wind, subsidence, and point and nonpoint pollution hazards;

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

(D) Prevent coastal flooding from inland projects.

Response: According to the Flood Insurance Rate Map for the area, the project site is located within Zone "C", an area of minimal flooding. In addition, the project site is not located within environmentally sensitive areas that are subject to natural hazards. The proposed project is not anticipated to affect the region's susceptibility to coastal hazards.

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 applications 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: Opportunities for public understanding of the proposed project are provided for during processing of the Environmental Assessment (EA) in accordance with Chapter 343, HRS, notice and public review provisions. All aspects of development will be conducted in accordance with applicable Federal, State, and County standards. Early consultation with agencies and interested parties was conducted for formulation of this EA. Additionally, public input opportunity will be provided in connection with the County's SMA application process. Specifically, a public hearing before the Maui Planning Commission will be conducted on the SMA application.

8. Public Participation

Objective

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

Policies

(A) Promote public involvement in coastal zone management processes;

(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 issues, developments, and government activities; and

(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: As previously mentioned, the EA document has been processed in accordance with Chapter 343, HRS, and opportunity for comment by agencies and the public was provided. The SMA application process, as well, offers opportunity for public comment. The proposed project does not contradict the objectives of public awareness, education, and participation.

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, minimize interference with natural shoreline processes, and 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: In broad objective terms, the proposed project will utilize appropriate BMPs to manage overall drainage and erosion control for the project site. Further, the proposed project will not involve construction near shoreline areas and is not, therefore, anticipated to have an adverse effect on the local beach environment.

10. Marine Resources

Objective

Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies

(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Response: Appropriate BMPs and erosion control measures will be implemented to ensure that coastal ecosystems are not adversely impacted by construction activities.

In addition to the foregoing objectives and policies, SMA permit review criteria pursuant to Act 224 (2005) provides that:

> No special management area use permit or special management area minor permit shall be granted for structures that allow artificial light from floodlights, uplights, or spotlights used for decorative or aesthetic purposes when the light:
>
> (1) Directly illuminates the shoreline and ocean waters; or
>
> (2) Is directed to travel across property boundaries toward the shoreline and ocean waters.

Response: The project does not contain lighting which is directed across property boundaries towards the shoreline. Lighting standards will be shielded downlighting. See **Appendix "F"**.

IV. SUMMARY OF UNAVOIDABLE ENVIRONMENTAL IMPACTS

IV. SUMMARY OF UNAVOIDABLE ENVIRONMENTAL IMPACTS

The proposed project will result in certain unavoidable construction-related environmental impacts as outlined in Chapter II.

In the short-term, construction associated with the project will generate noise impacts. These impacts will be limited to the immediate vicinity of the project construction areas. Sound attenuating construction equipment will be used, where practicable and necessary, to mitigate noise impacts caused by construction.

Unavoidable air quality impacts will also arise as a result of construction activities, such as the generation of dust and other airborne pollutants. Appropriate BMPs will be incorporated in the construction process to mitigate adverse impacts such as frequent watering of exposed surfaces and regular maintenance of construction equipment to minimize construction-related impacts.

In the long term, the proposed project is not anticipated to result in any significant, long-term, adverse environmental effects.

V. ALTERNATIVES TO THE PROPOSED ACTION

V. ALTERNATIVES TO THE PROPOSED ACTION

The Department of Parks and Recreation has looked at a variety of options in accommodating the proposed project.

A. PREFERRED ALTERNATIVE

The proposed development plan, outlined in Section I. Project Overview, represents the preferred alternative. This alternative, which entails an expansion of the existing LCC tennis courts complex, presents the most cost-effective and viable alternative as much of the capital infrastructure is already existent onsite.

B. NO ACTION ALTERNATIVE

As previously mentioned, there is already a need for an increase in the availability of tennis court recreational facilities in the West Maui region. Due to growth in population and housing development, the no action alternative would not satisfy the current and future needs of residents and visitors in regards to the availability of tennis courts for public use.

C. POSTPONED ACTION ALTERNATIVE

Similar to the no action alternative, the postponed action alternative does not address the current need for recreational tennis court facilities in the West Maui region.

D. ALTERNATIVE LOCATIONS

Alternative locations were not extensively considered due to cost considerations and the space availability adjacent to the existing LCC tennis courts complex. The proposed expansion at the proposed LCC site would require limited modifications to the existing water, wastewater, drainage and electrical systems already in place onsite. Furthermore, the proposed site holds a synergistic relationship with other LCC recreational facilities including a gymnasium, amphitheater and social hall, providing convenience and accessibility to a

variety of recreational activities all in close proximity. This methodology of public expenditure for capital projects is consistent with the County plans and policies to provide adequate public recreational facilities for the general public.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The development of the proposed project would involve the commitment of State lands and County of Maui funds. In addition, labor and material resources would be expended as part of the project's construction phase. Commitments of these resources are considered irreversible and irretrievable. These commitments, however, are also considered appropriate in the context of providing sufficient recreational tennis court facilities to satisfy the current and future demands of the West Maui region. Development of the proposed expansion will involve the commitment of land for a needed public facility which would preclude other land use options for the site. This commitment of land resources, however, is consistent with existing and future land uses in and around the project site.

VII. SIGNIFICANCE CRITERIA ASSESSMENT

VII. SIGNIFICANCE CRITERIA ASSESSMENT

The "Significance Criteria", Section 12 of the Administrative Rules, Title 11, Chapter 200, "Environmental Impact Statement Rules", were reviewed and analyzed to determine whether the proposed project will have significant impacts to the environment. The following criteria and analysis are provided.

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.**

   There are no significant natural resources which will be impacted by the proposed tennis complex expansion. Biological resources in and around the project site do not include rare or threatened species, nor are there sensitive natural environments (e.g., wetlands and streams) in the vicinity of the project site. There are no archaeological or culturally significant features in the project vicinity as well.

2. **Curtails the range of beneficial uses of the environment.**

   The proposed project will not curtail the range of beneficial uses of the environment. Best Management Practices (BMPs) will be employed where needed, to minimize any construction-related impacts to the environment.

3. **Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.**

   The proposed project does not conflict with the State's Environmental Policy and Guidelines as set forth in Chapter 344, Hawai`i Revised Statutes (HRS).

4. **Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.**

   The proposed project will directly benefit the local economy by providing construction and construction-related employment in the short term. The project will provide increased public accessibility to recreational tennis court facilities by means

of the expansion of the current LCC tennis courts complex. No impacts to cultural practices are anticipated as a result of the project.

5. **Substantially affects public health.**

No adverse impacts to the public health and welfare are anticipated as a result of the proposed expansion.

The proposed project will have an indirect beneficial effect on public health by enhancing existing recreational activities in the West Maui region.

6. **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

The proposed expansion of the LCC tennis courts complex will beneficially impact the recreational facilities in the area by providing increased access to tennis court facilities and the availability of tennis courts for public use.

The project is not anticipated to have any adverse effects on public services, such as police, fire, medical, educational, and solid waste collection services, nor will it have a negative impact on population parameters for the West Maui region.

From a land use standpoint, the proposed project is in keeping with the objectives and policies of the West Maui Community Plan, and is complementary to and compatible with surrounding land uses.

The proposed expansion is not anticipated to adversely impact water and wastewater capacities and facilities. Post-development onsite surface runoff is expected to be accommodated by the proposed drainage system improvements.

7. **Involves a substantial degradation of environmental quality.**

Aside from the short-term impacts related to dust and noise generated during the construction phase, there will not be a degradation of environmental quality. These potential dust and noise impacts will be mitigated through utilization of appropriate Best Management Practices (BMP).

The proposed expansion is not anticipated to adversely affect the open space and scenic character of the area. Additionally, there are no sensitive environments (e.g., wetlands, streams, erosion prone areas, etc.) which are likely to be affected by the proposed action.

8. **Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.**

The proposed project does not involve a commitment to larger actions. The impacts assessed in this document are based on the entire action.

9. **Substantially affects a rare, threatened, or endangered species, or its habitat.**

As previously noted, the flora and fauna are generally limited to non-native, abundant species at the project site. There are no rare, threatened, or endangered species of flora, fauna, or avifauna and their habitats at the project site which will be adversely affected by the proposed expansion of the LCC tennis courts complex.

10. **Detrimentally affects air or water quality or ambient noise levels.**

Construction activities will result in short-term air quality and noise impacts. Dust control measures, such as regular watering and sprinkling, and installation of dust screens will be implemented to minimize wind-blown emissions. Noise impacts will occur primarily from construction equipment. Equipment mufflers or other noise attenuating equipment, as well as proper equipment and vehicle maintenance, will be used during construction activities. Construction noise impacts will be mitigated through compliance with the provisions of the State of Hawai`i, Department of Health Administrative Rules Title 11, Chapter 46, "Community Noise Control". These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels set forth in the Chapter 46 rules. No long-term air or water quality or ambient noise level impacts are anticipated.

11. **Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.**

The project site is not located within and would not affect environmentally sensitive areas. The project site is located within Flood Zone C, an area of minimal flooding, and thus is not subject to flooding or tsunami inundation. Soils underlying the

project site are not erosion-prone and there are no geologically hazardous lands, estuaries, or coastal waters within or adjacent to the project site. No other foreseeable environmental effects are anticipated in conjunction with the proposed expansion.

12. Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.

The project site is not identified as a scenic vista or viewplane and thus will not affect scenic corridors and costal scenic and open space resources, nor will it adversely impact the visual character of the areas surrounding the project site.

13. Requires substantial energy consumption.

The proposed project will involve a limited commitment of fuel for construction equipment, vehicles, and machinery during construction and maintenance activities. However, this use in not anticipated to result in substantial consumption of energy resources.

In addition, coordination with Maui Electric Company, Ltd. (MECO) will be undertaken during the electrical upgrade work to ensure all operational parameters are addressed for the proposed project. In the long term, the project will create an additional demand for electricity. However, this demand is not deemed substantial or excessive within the context of the region's overall energy consumption.

Based on the foregoing analysis, it has been determined that this Final EA document will be issued as a Finding of No Significant Impact (FONSI).

VIII. LIST OF PERMITS AND APPROVALS

VIII. LIST OF PERMITS AND APPROVALS

The following permits and approvals will be required prior to the implementation of the proposed project.

State of Hawai`i

1. NPDES permit (for stormwater discharge associated with construction activities)

2. Noise Permit (as applicable for construction activities)

County of Maui

1. Special Management Area Use Permit

2. Building Permit

3. Grading Permit

IX. PARTIES CONSULTED IN THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

IX. PARTIES CONSULTED IN THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

The following list of agencies, organizations and individuals were consulted in the preparation of the Draft Environmental Assessment (EA). Agency comments and responses to substantive comments are included herein.

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8. Theodore E. Liu, Director
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11. Micah Kane, Chairman
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Department of Water Supply
200 South High Street
Wailuku, Hawai`i 96793

30. **Hawaiian Telcom**
60 South Church Street
Wailuku, Hawai`i 96793

31. Greg Kauhi, Manager, Customer Operations
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawai`i 96733

32. Joe Pluta, President
West Maui Improvement Foundation
P. O. Box 10338
Lahaina, Hawai`i 96761

33. Zeke Kalua, Executive Director
West Maui Taxpayers Association
P.O. Box 10338
Lahaina, Hawai`i 96761

MAY 2 2 2008

LINDA LINGLE
GOVERNOR

JANICE TAKAHASHI
INTERIM EXECUTIVE DIRECTOR

STATE OF HAWAII

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM
HAWAII HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY REFER TO:

08:PEO/60

May 20, 2008

Munekiyo & Hiraga, Inc.
Attn: Kimberly Skog, Planner
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

Re: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK (2)4-5-5021:010, 016, and 020(por.), Lahaina, Maui, Hawaii

Thank you for consulting the Hawaii Housing Finance and Development Corporation on the above-referenced project.

We have no housing-related comments to offer at this time.

Sincerely,

Janice Takahashi
Interim Executive Director

MAY 2 8 2008

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M. D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

May 27, 2008

Ms. Kimberly Skog
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai`i 96793

Dear Ms. Skog:

Subject: **Early Consultation Request for the Expansion of Lahaina Civic Center Tennis Courts Complex**
TMK: (2) 4-5-021: 010, 016 and 020 (por.)

Thank you for the opportunity to participate in the early review and consultation process for the expansion of the Lahaina Civic Center Tennis Courts Complex. The following comments are offered:

1. The noise created during the construction phase of the project may exceed the maximum allowable levels as set forth in Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control". A noise permit may be required and should be obtained before the commencement of work.

2. National Pollutant Discharge Elimination System (NPDES) permit coverage is required for this project. The Clean Water Branch should be contacted at 808 586-4309.

It is strongly recommended that the Standard Comments found at the Department's website: http://hawaii.gov/health/environmental/env-planning/landuse/landuse.html be reviewed, and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please call me at 808 984-8230.

Sincerely,

Herbert S. Matsubayashi
District Environmental Health Program Chief

2

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Herbert S. Matsubayashi
District Environmental Health Program Chief
State of Hawai`i
Department of Health
Maui District Health Office
54 High Street
Wailuku, Hawaii 96793-2102

SUBJECT: Early Consultation Request for the Proposed Expansion of the Lahaina Civic Center Tennis Courts Complex at Tax Map Key (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.)

Dear Mr. Matsubayashi:

Thank you for your letter of May 27, 2008, providing pre-assessment comments on the proposed expansion of the Lahaina Civic Center Tennis Courts Complex. We provide the following information to address the comments which you have provided.

1. As applicable, a noise permit will be secured by the contractor pursuant to Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control".

2. A National Pollutant Discharge Elimination System Permit will be obtained from the Department prior to construction.

We note that other applicable requirements of the Department's standard comments will be adhered to.

A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Thank you again for your valuable input.

Very truly yours,

for Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
S:\DATA\RFE\LahainaCC Tennis\DOHMaui.ecres.wpd

MAY 3 0 2008

LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

BARBARA A. ANN
DEPUTY COMPTROL F

(P)1133.8

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

MAY 2 8 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

Subject: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK (2)4-5-021.010, 016, and 020(por.), Lahaina, Maui, Hawaii

Thank you for the opportunity to provide early consultation comments on the subject project. This proposed project should have minimal effect on the Lahaina Comprehensive Health Center and Lahaina District Court and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400 or have your staff call Mr. Clarence Kubo of the Public Works Division at 586-0488.

Sincerely,

Russ K. Saito

RUSS K. SAITO
State Comptroller

5

MAY 3 0 2008

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

May 28, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai`i 96783

Dear Ms. Skog:

SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK (2) 4-5-021:010,016 and 020 (por.) Lahaina, Maui, Hawai`i

The Department of Education has no comment or concern to offer as early consultation for the proposed expansion of the tennis complex.

Should you have any questions, please call George Casen of the Facilities Development Branch at (808) 377-8308.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:jmb

cc: Randolph Moore, Assistant Superintendent, OSFSS
Duane Kashiwai, Public Works Administrator, FDB
Ron Okamura, CAS, Hana/Lahaina/Lanai/Molokai Complex Areas

JUN 0 2 20(

LINDA LINGLE
GOVERNOR

GEORGINA K. KAWAMURA
DIRECTOR

ROBERT N. E. PIPER
DEPUTY DIRECTOR

EMPLOYEES' RETIREMENT SYSTEM
HAWAII EMPLOYER-UNION HEALTH BENEFITS TRUST FUND
OFFICE OF THE PUBLIC DEFENDER
PUBLIC UTILITIES COMMISSION

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
P.O. BOX 150
HONOLULU, HAWAII 96810-0150

ADMINISTRATIVE AND RESEARCH OFFICE
BUDGET, PROGRAM PLANNING AND
MANAGEMENT DIVISION
FINANCIAL ADMINISTRATION DIVISION

May 29, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

Your request for comments on the proposed expansion of Lahaina Civic Center Tennis Courts Complex project located in Lahaina, Maui, has been reviewed. In accordance with Chapter 343, HRS, we have no substantive pre-assessment comment to provide.

If you should have any questions regarding this matter, please contact Mr. Neal Miyahira, Administrator of the Budget, Program Planning and Management Division at (808) 586-1530.

Aloha,

Georgina K. Kawamura

GEORGINA K. KAWAMURA
Director of Finance

JUN 0 3 2008

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD08/3675B

May 30, 2008

Kimberly Skog, Planner
Munekiyo & Hiraga Inc.
305 High Street, Suite 104
Wailuku, HI 96793

RE: Pre-consultation for the proposed expansion of the Lahaina Civic Center tennis courts complex, Maui, TMK: (2) 4-5-021: 010, 016 and 020.

Aloha e Kimberly Skog,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned request for pre-consultation, dated May 13, 2008. Maui County's Department of Parks and Recreation proposes to expand and improve the existing tennis complex at the Lahaina Civic Center. OHA has reviewed the project and offers the following comments.

OHA requests that a comprehensive archaeological inventory survey for the project area be conducted and submitted to the Department of Land and Natural Resources – Historic Preservation Division for review and approval. OHA should be allowed the opportunity to comment on the criteria assigned to any cultural or archaeological sites identified within the archaeological inventory survey. Consideration must also be afforded to any individuals accessing the project area for constitutionally protected traditional and customary purposes, in accordance with the Hawai'i State Constitution, Article XII, section 7.

We request the applicant's assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the project, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

In addition, OHA recommends that the applicant use native vegetation in its landscaping plan for the subject parcel. Landscaping with native plants furthers the traditional Hawaiian concept of mālama 'āina and creates a more Hawaiian sense of place.

Further, OHA notes that two of the parcels are designated as Section 5(b) Ceded Lands, which hold a considerable amount of sentimental, historical and legal significance for Native Hawaiians and OHA. These lands were illegally taken from the Hawaiian Kingdom after the 1893 overthrow and later transferred ("ceded") by the United States government to the State of Hawai'i upon statehood. Today, the state holds the Ceded Lands corpus in trust for Native Hawaiians and the general public.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong (808) 594-0248 or e-mail him at sterlingw@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

C: OHA Maui CRC Office

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Clyde W. Namu`o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawai`i 96813

SUBJECT: Early Consultation Request for Proposed Expansion of the Lahaina Civic Center Tennis Courts Complex, Maui; TMK Nos. 4-5-021:010, 016 and 020

Dear Mr. Namu`o:

We are writing to you on behalf of the applicant, the County of Maui Department of Parks and Recreation, to thank you for your letter dated May 30, 2008, providing comments on the proposed expansion of the Lahaina Civic Center tennis courts complex located in Lahaina, Maui, Hawai`i.

We offer the following comments, in response to your remarks:

1. A comprehensive archaeological field inspection report was completed for approximately 5.71 acres of the Wahikuli Ahapua`a in Lahaina, Maui on April 11, 2008 and will be included in the Draft EA for your review. The results further indicate that there were no cultural or archaeological resources identified within the study parcels. As applicable, consideration will be afforded to any individuals accessing the project area for constitutionally protected and traditional and customary purposes.

2. In accordance with Section 6E-43.6, Hawai`i Revised Statues and Chapter 13-300, Hawai`i Administrative Rules, should iwi kupuna or Native Hawaiian cultural or traditional deposits be found during ground disturbance or excavation during the construction of the project, the applicant assures that work will cease and the State Historic Preservation Division of the Department of Land and Natural Resources (SHPD/DLNR) will be contacted.

3. The applicant will use native vegetation in its landscaping plan for the subject parcels, to the extent practicable, to promote the traditional Hawaiian concept of malama `aina and create a more Hawaiian sense of place.

4. Your comments in regards to two (2) of the parcels designated as Section 5(b) Ceded Lands have been forwarded to the County of Maui Department of Parks and Recreation for review.

We appreciate the input received from your office. A copy of the Draft EA will be provided for your review and comment.

Should you have any questions, please do not hesitate to contact me at (808) 244-2015.

Very truly yours,

for Kimberly Skog, Planner

KS:tn
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
S:\DATA\RFE\LahainaCC Tennis\OHAecIresp.ltr.wpd

JUN 0 5 2008

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply please refer to
EMD / CWB

06007PMT.08

June 3, 2008

Ms. Kimberly Skog
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

Subject: Early Consultation Request – Draft Environmental Assessment (DEA)
Proposed Expansion of Lahaina Civic Center Tennis Courts Complex
TMK: (2) 4-5-021:010, 016, and 020 (portion)
Lahaina, Maui, Hawaii

The Department of Health, Clean Water Branch (CWB), has reviewed your letter dated May 13, 2008, regarding the subject project and offers these comments. Please note that our review is based solely on the information provided in your letter for the subject project and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. The Wahikuli State Wayside Park is identified as a Priority Category 5 waters in the Section 303(d) of the Clean Water Act list of impaired water bodies. Priority 5 waters are described as surface waters where available data and/or information indicate that at least one (1) designated use is not being supported or is threatened, and a Total Maximum Daily Load is needed. Accordingly, the subject DEA should also include this consideration toward ensuring the protection and improvement of this water body with respect to the subject project.

3. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

   a. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the start of the construction activities.

   b. Hydrotesting water.

   c. Construction dewatering effluent.

   d. Treated effluent from well drilling activities.

   You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

4. For other types wastewater not listed in Item No. 3 above or wastewater discharging into Class 1 or Class AA waters, will need to be covered under an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

5. You must also submit a copy of the NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.

6. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage is required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

MT:np

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Alec Wong, P.E., Chief
Department of Health
Clean Water Branch
P. O. Box 3378
Honolulu, Hawai`i 96801

SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK Nos. 4-5-021:010, 016 and 020 (portion), Lahaina, Maui, Hawai`i

Dear Mr. Wong:

We are writing to you on behalf of the applicant, the County of Maui Department of Parks and Recreation, to thank you for your department's letter dated June 3, 2008, providing comments on the proposed expansion of the Lahaina Civic Center Tennis Courts Complex in Lahaina, Maui, Hawai`i.

We offer the following comments, in response to your remarks:

1. There are no potential impacts to State waters identified at this time. Nonetheless, the project will be implemented in a manner which ensures strict compliance with Chapter 11-54, Hawai`i Administrative Rules.

2. As noted, there are no anticipated impacts to State waters associated with the project. BMPs will be implemented during the construction of the proposed project towards ensuring the protection of the Wahikuli State Wayside Park water body.

3. Applicable National Pollutant Discharge Elimination System (NPDES) general permits will be obtained.

4. If applicable, individual NPDES permits will be obtained for other types of wastewater not listed under Item No. 3 or wastewater discharging into Class 1 or Class AA waters.

5. If applicable, a NOI will be submitted for review by the State Historic Preservation Division of the Department of Land and Natural Resources. The applicant will submit a copy of its request for review by SHPD or SHPD's determination letter for the project along with the NOI or NPDES permit application, as applicable.

6. All discharges related to project construction or operation activities will comply with the applicable State Water Quality Standards as specified in HAR, Chapter 11-54 and/or permitting requirements as specified in HAR, Chapter 11-55. Discharges will be kept to a minimum through the application of engineering BMPs.

We appreciate the input received from your office. A copy of the Draft EA will be provided for your review and comment.

Should you have any questions, please do not hesitate to contact me at (808) 244-2015.

Very truly yours,

for Kimberly Skog, Planner

KS:tn
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
S:\DATA\RFE\LahainaCC Tennis\DOHCWBecIresp.ltr.wpd

JUN 0 9 2008

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 6, 2008

Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Attention: Ms. Kimberly Skog
Planner

Dear Ms. Skog:

SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex, located in Lahaina, Island of Maui; TMK: (2) 4-5-021:010,016, and 020 (por.)

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the Engineering Division on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at 587-0417. Thank you.

Sincerely,

Darlene D. Unoki
for Morris M. Atta
Administrator

Enclosure

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

'08 MAY 20 P1:32 RECEIVED
ENGINEERING
LAND DIVISION

2008 MAY 27 P 3:51

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 19, 2008

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources
___Div. of Boating & Ocean Recreation
x Engineering Division
___Div. of Forestry & Wildlife
___Div. of State Parks
_x_Commission on Water Resource Management
_x_Office of Conservation & Coastal Lands
_x_Land Division – Maui District

FROM: Morris M. Atta, Administrator
SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex
LOCATION: Lahaina, Island of Maui; TMK: (2) 4-5-021:010, 016 and 020 (por.)
APPLICANT: Maui Department of Parks and Recreation

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 2, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: _____
Date: 5/23/08

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/MorrisAtta
Ref.: EarlyConLahainaCivicCenter
Maui.411

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) **Please take note that based on the map the you provided, the project site according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone D. The National Flood Insurance Program does not have any regulations for developments within Zone D.**

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments:_____

_____

( ) Other:_____

_____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: Eric T. Hirano

ERIC T. HIRANO, CHIEF ENGINEER

Date: 5/23/08

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Laura Thielen
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawai`i 96809

SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex, located in Lahaina, Island of Maui
TMK Nos. 4-5-021:010, 016 and 020 (por.)

Dear Ms. Thielen:

We are writing to you on behalf of the applicant, the County of Maui Department of Parks and Recreation, to thank you for your department's letter dated June 6, 2008, providing comments on the proposed expansion of the Lahaina Civic Center tennis courts complex in Lahaina, Maui, Hawai`i.

We offer the following comments, in response to your remarks:

1. We confirm that the project site is located in a flood zone identified as an area of low flood risk and minimal flooding with no development restrictions.

We appreciate the input received from your office. A copy of the draft environmental assessment will be provided for your review and comment.

Should you have any questions, please do not hesitate to contact me at (808) 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:tn
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
F:\DATA\RFE\LahainaCC Tennis\DLNRecIresp.ltr.wpd

JUN 13 2008

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.2906

June 12, 2008

Ms. Kimberly Skog
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

Subject: Early Consultation – Tennis Court Complex Expansion
Lahaina Civic Center

The proposed tennis court expansion project is not anticipated to significantly impact the Department of Transportation's (DOT) facilities. As the project is upland of Honoapiilani Highway, the DOT requests that drainage from the additional surface areas of the tennis courts and parking lot does not runoff to Honoapiilani Highway.

The DOT also requests advance opportunity for DOT Highways Division review of the collective traffic activity on Leialii Parkway and Honoapiilani Highway. The Highways Division is interested in traffic impact analysis reports of phasing and timetables of future projects with accesses to the State highway.

The DOT appreciates the courtesy of your early consultation. The Highways Division Maui District Office or Planning Branch should be contacted whenever the tennis court project is modified and the modifications result in potential impacts to Honoapiilani Highway.

Very truly yours,

Francis Paul Keeno

for BRENNON T. MORIOKA, PH.D., P.E.
Director of Transportation

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Brennon T. Morioka, Ph. D, P. E.
Director of Transportation
State of Hawai`i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai`i 96813-5097

SUBJECT: Early Consultation Request for the Proposed Expansion of the Lahaina Civic Center Tennis Courts Complex at Tax Map Key (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.)

Dear Mr. Morioka:

Thank you for your letter of June 12, 2008, providing pre-assessment comments on the subject project. We are providing the following information in response to your comments.

1. Drainage improvements will be installed in connection with the four (4) new tennis courts and new parking lot. The design of the drainage improvements will ensure that no additional runoff will flow onto Honoapi`ilani Highway.

2. A traffic impact assessment report has been prepared for the proposed action. A copy of the report will be included in the Draft EA for your review.

3. Should there be future modifications to the tennis court complex, appropriate coordination will be undertaken with the Department's Maui District Office.

Thank you again for your comments. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
F:\DATA\RFE\LahainaCC Tennis\SDOT.ecres.wpd

MAY 2 2 2008

DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
COUNTY OF MAUI

CHARMAINE TAVARES
Mayor

VANESSA A. MEDEIRC
Direct

LORI TSUHAKO
Deputy Direct

200 SOUTH HIGH STREET • WAILUKU, HAWAII 96793 • PHONE (808) 270-7805 • FAX (808) 270-7165 • EMAIL director.hhc@mauicounty.gov

May 19, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK (2) 4-5-021:010, 016, and 020(por.), Lahaina, Maui, Hawaii

We have reviewed the Early Consultation Request for the above subject project and wish to inform you that this Department has no comment to offer.

Thank you for the opportunity to comment.

Sincerely,

Vanessa A Medeiros

VANESSA A. MEDEIROS
Director of Housing and Human Concerns

xc: Housing Division

MAY 2 7 2008

CHARMAINE TAVARES
MAYOR

JEFFREY A. MURRAY
CHIEF

ROBERT M. SHIMADA
DEPUTY CHIEF

COUNTY OF MAUI
DEPARTMENT OF FIRE AND PUBLIC SAFETY
FIRE PREVENTION BUREAU

780 ALUA STREET
WAILUKU, HAWAII 96793
(808) 244-9161
FAX (808) 244-1363

May 22, 2008

Munekiyo & Hiraga, Inc.
Attention: Kimberly Skog, Planner
305 High Street, Suite 104
Wailuku, Hawaii 96793

SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED EXPANSION OF LAHAINA CIVIC CENTER TENNIS COURTS COMPLEX, TMK (2)4-5-021:010, 016, and 020. LAHAINA, MAUI, HAWAII

Dear Ms. Skog,

I have had an opportunity to review the request for comments regarding the tennis courts project in Lahaina. We are excited about the new facilities for the public and support the project in general. The existing courts are close to the service road bordering the post office. Users of the existing courts park along the service road when playing tennis. With the addition of the new parking lot, will all players be required to park in the parking lot? Would it be in the public's best interest to prohibit parking along the service road leading to the emergency services?

As you are well aware, three emergency service agencies utilize the roadway with emergency vehicles. At times, a fire truck that is responding to Lahaina town needs to make way for vehicles traveling uphill towards the Civic Center. In any case, a slight delay is possible. I would not consider this to be a tremendous problem or concern but mostly an inconvenience and delayed response on the part of the emergency personnel responding. There is enough room if someone pulls to the side when cars are parked. A detailed look at this topic would be welcomed and appreciated. Please feel free to contact me if there are any questions or concerns regarding these comments.

Sincerely,

Valeriano F. Martin
Captain
Fire Prevention Bureau

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Valeriano F. Martin, Captain
County of Maui
Department of Fire and Public Safety
Fire Prevention Bureau
780 Alua Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for the Proposed Expansion of the Lahaina Civic Center Tennis Courts Complex at Tax Map Key (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.)

Dear Captain Martin:

Thank you for your letter of May 22, 2008, providing pre-assessment comments on the proposed expansion of the Lahaina Civic Center Tennis Courts Complex.

In response to your comments, the Department will review parking conditions along the service road to identify measures for safe passage of emergency vehicles. The Department will consider measures such as limiting parking on one side of the existing 28-foot wide service driveway to provide adequate clearances for emergency vehicles. We note that the additional 25 parking stalls is anticipated to alleviate public parking along the service road.

A copy of the Draft Environmental Assessment will be provided to your office for review and comment. Thank you again for your valuable input on this proposed action.

Very truly yours,

for Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
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JUN 0 9 2008

POLICE DEPARTMENT
COUNTY OF MAUI

CHARMAINE TAVARES
MAYOR

OUR REFERENCE
YOUR REFERENCE

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

THOMAS M. PHILLIPS
CHIEF OF POLICE

GARY A. YABUTA
DEPUTY CHIEF OF POLICE

June 4, 2008

Ms. Kimberly Skog
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Skog:

SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex
TMK (2) 4-5-021:010, 016, and 020 (por.)

This is in response to your letter May 13, 2008, requesting comments on the above subject.

We have reviewed the information for the above mentioned subject and offer the enclosed comments.

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

Very truly yours,

Assistant Chief Wayne T. Ribao
for: Thomas M. Phillips
Chief of Police

c: Jeffrey Hunt, Maui County Dept. of Planning

COPY

TO: Thomas PHILLIPS, CHIEF OF POLICE, COUNTY OF MAUI

VIA: CHANNELS

CONCUR:
AC Wayne Ribbo
06/04/08

FROM: Lawrence N. KAUHA'AHA'A, ACTING SERGEANT, LAHAINA SPEICALIZED

SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED EXPANSION OF LAHAINA CIVIC CENTER. TENNIS COURTS COMPLEX

The following to/from transmittal is being submitted following the review of the attached Proposal.

Based on the information provided this Officer does not anticipate any adverse safety conditions created by this project.

Any additional off street parking created in this area will promote pedestrian safety.

Submitted for your perusal,

Lawrence N. KAUHA'AHA'A, 8851
ACTING SERGEANT, LAHAINA SPECIALIZED
05.30.08 @ 1506 HOURS

6/3/04

JUN 0 3 2008

CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
200 SOUTH HIGH STREET, ROOM NO. 434
WAILUKU, MAUI, HAWAII 96793

May 30, 2008

Ms. Kimberly Skog, Planner
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Ms. Skog:

SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED EXPANSION OF LAHAINA CIVIC CENTER TENNIS COURTS COMPLEX; TMK: (2) 4-5-021:010, 016 AND 020 (POR.)

We reviewed the subject application and have the following comment:

1. The Lahaina Civic Center roads need to be better maintained and that the existing roads be resurfaced.

Please call Michael Miyamoto at 270-7845 if you have any questions regarding this letter.

Sincerely,

MILTON M. ARAKAWA, A.I.C.P.
Director of Public Works

MMA:MMM:ls
xc: Highways Division
Engineering Division
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MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Milton Arakawa, Director
Department of Public Works
200 South High Street, Room 434
Wailuku, Hawai`i 96793

SUBJECT: Early Consultation Request for Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK Nos. 4-5-021:010, 016 and 020 (por.)

Dear Mr. Arakawa:

We are writing to you on behalf of the applicant, County of Maui Department of Parks and Recreation, to thank you for your letter dated May 30, 2008, regarding the proposed expansion of the Lahaina Civic Center tennis courts complex in Lahaina, Maui, Hawai`i.

In response to your comments, we note that maintenance requirements for Lahaina Civic Center roads are being reviewed with implementation programming to be formulated.

We appreciate the input from your office. A copy of the Draft Environmental Assessment will be provided for your review and comment.

Should you have any questions, please do not hesitate to contact me at (808) 244-2015.

Very truly yours,

for Kimberly Skog, Planner

KS:tn
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
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305 High Street, Suite 104 · Wailuku, Hawaii 96793 · ph: (808)244-2015 · fax: (808)244-8729 · planning@mhplanning.com · www.mhplanning.com

MAY 2 1 2008

Maui Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahului, Maui, HI 96733-6898 • (808) 871-8461

May 19, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai`i 96793

Dear Ms. Skog,

Subject: Early Consultation Request for Proposed
Expansion of Lahaina Civic Center Tennis Courts Complex
Lahaina, Maui, Hawaii
TMK: (2) 4-5-021:010, 016 and 020 (por.)

Thank you for allowing us to comment on the early consultation phase of the proposed subject project, which was received on May 15, 2008.

In reviewing our records and the information received, Maui Electric Company (MECO) has no objection to the project at this time. However, we highly encourage the developer's electrical consultant to submit its electrical demand requirements and project time schedule as soon as practical so that service can be provided on a timely basis.

In addition, may we suggest that the developer and/or their consultant make contact with Ray Cibulskis of our Demand Side Management (DSM) group at 872-3226 to review potential energy conservation and efficiency opportunities for their project.

Should you have any other questions or concerns, please don't hesitate to contact me at 871-2345.

Sincerely,

Kimberly Kawahara
Engineer I

cc: Ray Cibulskis – MECO DSM

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

June 13, 2008

Kimberly Kawahara, Engineer I
Maui Electric Company, Ltd.
210 West Kamehameha Avenue
P. O. Box 398
Kahului, Hawai`i 96733-6898

SUBJECT: Early Consultation Request for the Proposed Expansion of the Lahaina Civic Center Tennis Courts Complex at Tax Map Key (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.)

Dear Ms. Kawahara:

Thank you for your letter of May 19 2008, providing pre-assessment comments on the proposed expansion of the Lahaina Civic Center Tennis Courts Complex.

In response to your comments, the Department's design team will continue to work with Maui Electric Company to ensure that electrical demand requirements can be addressed in a timely manner. In this connection, coordination with the Demand Side Management group will be undertaken, as needed, to facilitate utilization of energy conservation measures.

A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Thank you again for your valuable input on this proposed action.

Very truly yours,

for Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
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X. AGENCIES CONSULTED DURING THE DRAFT ENVIRONMENTAL ASSESSMENT PUBLIC COMMENT PERIOD; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

X. AGENCIES CONSULTED DURING THE DRAFT ENVIRONMENTAL ASSESSMENT PUBLIC COMMENT PERIOD; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

A notice of the Draft Environmental Assessment (EA) for the subject project was filed and published in the Office of Environmental Quality Control's, The Environmental Notice on July 8, 2008.

The following agencies were sent a copy of the Draft EA for review and comment. Comments on the Draft EA were received during the 30-day public comment period. Agency comments, as well as responses to substantive comments, are included in this chapter.

1. Ranae Ganske-Cerizo, Soil Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
700 Hookele Street, Suite 202
Kahului, Hawai`i 96732

2. George Young
Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Honolulu
Regulatory Branch
Building 230
Fort Shafter, Hawai`i 96858-5440

3. Patrick Leonard
Field Supervisor
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., Rm. 3-122
Box 50088
Honolulu, Hawai`i 96813

4. Russ K. Saito, State Comptroller
Department of Accounting and General Services
1151 Punchbowl Street, #426
Honolulu, Hawai`i 96813

5. Sandra Lee Kunimoto, Chair
Department of Agriculture
1428 South King Street
Honolulu, Hawai`i 96814-2512

6. Georgina K. Kawamura, Director
Department of Budget and Finance
P. O. Box 150
Honolulu, Hawai`i 96810

7. Executive Director
Hawai`i Housing Finance and Development Corporation
677 Queen Street
Honolulu, Hawai`i 96813

8. Theodore E. Liu, Director
State of Hawai`i
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawai`i 96804

9. Patricia Hamamoto, Superintendent
State of Hawai`i
Department of Education
P.O. Box 2360
Honolulu, Hawai`i 96804

10. Heidi Meeker
Planning Division
Office of Business Services
Department of Education
c/o Kalani High School
4680 Kalanianaole Highway, #T-B1A
Honolulu, Hawai`i 96821

cc: Ron Okumura, Complex Area Superintendent (Lanai/Moloka`i/Hana/Lahaina) 18.

11. Micah Kane, Chairman
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawai`i 96805

12. Chiyome Fukino, M.D., Director
State of Hawai`i
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawai`i 96814

13. Alec Wong, P.E., Acting Chief
Clean Water Branch
State of Hawai`i
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawai`i 96814

14. Herbert Matsubayashi
District Environmental Health Program Chief
State of Hawai`i
Department of Health
54 High Street
Wailuku, Hawai`i 96793

15. Laura Thielen, Chairperson
State of Hawai`i
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawai`i 96809

16. Dr. Puaalaokalani Aiu, Administrator
State of Hawai`i
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawai`i 96707

17. Brennon Morioka, Director
State of Hawai`i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai`i 96813

cc: Fred Cajigal

Katherine Kealoha, Director
Office Of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawai`i 96813

19. Clyde Namu`o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawai`i 96813

20. Abbey Seth Mayer, Director
State of Hawai`i
Office of Planning
P.O. Box 2359
Honolulu, Hawai`i 96804

21. Dan Davidson, Executive Officer
State of Hawai`i
State Land Use Commission
P.O. Box 2359
Honolulu, Hawai`i 96804

22. Jeffrey A. Murray, Fire Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawai`i 96732

23. Vanessa A. Medeiros, Director
County of Maui
Department of Housing and Human Concerns
One Main Plaza
2200 Main Street, Suite 546
Wailuku, Hawai`i 96793

24. Jeffrey Hunt, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawai`i 96793

25. Thomas Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawai`i 96793

26. Milton Arakawa, Director
County of Maui
Department of Public Works
200 South High Street
Wailuku, Hawai`i 96793

27. Cheryl Okuma, Director
County of Maui
Department of Environmental Management
One Main Plaza
2200 Main Street, Suite 176
Wailuku, Hawai`i 96793

28. Donald Medeiros, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawai`i 96793

29. Jeffrey Eng, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawai`i 96793

30. **Hawaiian Telcom**
60 South Church Street
Wailuku, Hawai`i 96793

31. Greg Kauhi, Manager, Customer Operations
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawai`i 96733

32. Joe Pluta, President
West Maui Improvement Foundation
P. O. Box 10338
Lahaina, Hawai`i 96761

33. Zeke Kalua, Executive Director
West Maui Taxpayers Association
P.O. Box 10338
Lahaina, Hawai`i 96761

AUG 2 0 2008

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

REPLY TO
ATTENTION OF:

August 13, 2008

Regulatory Branch

File Number POH-2008-187

Munekiyo & Hiraga, Inc.
305 South High Street, Suite 104
Wailuku, HI 96793
Attention: Ms. Kimberly Skog

Dear Ms. Skog:

This responds to your letter dated July 3, 2008 requesting our review of the Special Management Area (SMA) Application and Draft Environmental Assessment (EA) for the proposed Lahaina Civic Center Tennis Courts Complex Expansion Project in Lahaina, Maui, Hawaii (TMK (2) 4-5-21:10, 16, 20). We have reviewed the document with respect to the Corps' authority to issue Department of the Army (DA) permits pursuant to Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 U.S.C 403) and Section 404 of the Clean Water Act (33 U.S.C 1344).

Section 404 of the Clean Water Act requires that a Department of the Army (DA) permit be obtained for the discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide extending shoreward to the mean high water mark.

Based on our review of the information provided in your submitted document and on other information available to this office, we have determined that the project site does not include any waters subject to our regulatory jurisdiction; therefore, **a DA permit will not be required.**

Should you have any questions regarding this jurisdictional determination, please contact Mr. Peter Galloway of my staff at (808) 438-8416 or at peter.c.galloway@usace.army.mil. Please cite file number POH-2008-187 in future correspondence concerning this project. For additional information about our Regulatory Program, visit our web site at http://www.poh.usace.army.mil/EC-R/EC-R.htm.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

enclosure
cc: Tamara Horcajo, Director, County of Maui, Department of Parks & Recreation, Attention: Baron Sumida, 700 Halia Nakoa Street, Unit 2, Wailuku, Hawaii, 96793 (w/out enclosure)

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 13 Aug 2008

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Honolulu (CEPOH-EC-R) POH-2008-187 Tennis Complex Expansion

C. PROJECT LOCATION AND BACKGROUND INFORMATION: Lahaina Civic Center, TMK 245021010, 016 & 020
State:Hawaii County/parish/borough: Maui County City: Lahaina
Center coordinates of site (lat/long in degree decimal format): Lat. 20.90358° N, Long. 156.683699° W.
Universal Transverse Mercator: UTM Zone 4 North NAD83
Name of nearest waterbody: Pacific Ocean
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows:
Name of watershed or Hydrologic Unit Code (HUC):
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: 13 Aug 2008
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Are no "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are no "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: Pick List
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: **Site absent of WOUS.**

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: Pick List
   Drainage area: Pick List
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through Pick List tributaries before entering TNW.

   Project waters are Pick List river miles from TNW.
   Project waters are Pick List river miles from RPW.
   Project waters are Pick List aerial (straight) miles from TNW.
   Project waters are Pick List aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: .
   Tributary stream order, if known: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: Pick List.

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain:		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: Pick List
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: Pick List
Estimate average number of flow events in review area/year: Pick List
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: Pick List. Characteristics: .

Subsurface flow: Pick List. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by:	☒ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: Pick List. Explain: .

Surface flow is: Pick List

Characteristics: .

Subsurface flow: Pick List. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are Pick List river miles from TNW.

Project waters are Pick List aerial (straight) miles from TNW.

Flow is from: Pick List.

Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☒ TNWs: linear feet width (ft), Or, acres.
   - ☒ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☒ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☒ Tributary waters: linear feet width (ft).
- ☒ Other non-wetland waters: acres.
  Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☒ Tributary waters: linear feet width (ft).
   - ☒ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☒ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☒ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   - ☒ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☒ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☒ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☒ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☒ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☒ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☒ which are or could be used for industrial purposes by industries in interstate commerce.
- ☒ Interstate isolated waters. Explain: .
- ☒ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
☒ Tributary waters: linear feet width (ft).
☒ Other non-wetland waters: acres.
Identify type(s) of waters: .
☒ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☒ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☒ Other: (explain, if not covered above): **Site consists entirely of UPLANDS.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:SMA Application rec'd 07 Jul 2008.
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☒ Data sheets prepared by the Corps: .
☒ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name:1:24000 Topo Image, 1997 (TIG eGIS website, ret'vd 12 Aug 2008).
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: Survey conducted 31 Dec 2006.
☒ National wetlands inventory map(s). Cite name:US Fish & Wildlife Services Online Wetland Mapper, ret'vd 12 Aug 2008.
☒ State/Local wetland inventory map(s): .
☒ FEMA/FIRM maps: .
☒ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):Aerial, 2000 & Satellite, 2004-06 (TIG eGIS website, ret'vd 12 Aug 2008).
or ☒ Other (Name & Date):SMA Application/Draft EA rec'd 07 Jul 2008.
☒ Previous determination(s). File no. and date of response letter: .
☒ Applicable/supporting case law: .
☒ Applicable/supporting scientific literature: .
☒ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

August 22, 2008

George P. Young, P.E., Chief
Regulatory Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawai`i 96858-5440

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Young:

Thank you for your letter dated August 13, 2008 providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

The applicant concurs that the project site does not include any waters which fall under your regulatory jurisdiction and that a Department of the Army Permit will not be required for the subject project.

Thank you again for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:lfm
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
F:\DATA\RFE\LahainaCC Tennis\DArmyDEASMA.res.wpd

305 High Street, Suite 104 · Wailuku, Hawaii 96793 · ph: (808)244-2015 · fax: (808)244-8729 · planning@mhplanning.com · www.mhplanning.com

JUL 1 4 2008

LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

BARBARA A. ANNIS
DEPUTY COMPTROLLER

(P)1219.8

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

JUL 11 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

Subject: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK (2)4-5-021.010, 016, and 020(por.), Lahaina, Maui, Hawaii (SM1 2008 0015)

Thank you for the opportunity to provide comments on the Special Management Area Application and Draft Environmental Assessment for the proposed Expansion of the Lahaina Civic Center Tennis Courts Complex project. This project should have minimal effect on the Lahaina Comprehensive Health Center and Lahaina District Court and we have no comments to offer.

If you have any questions, please call me at 586-0400 or have your staff call Mr. Clarence Kubo of the Public Works Division at 586-0488.

Sincerely,

Russ K. Saito

RUSS K. SAITO
State Comptroller

JUL 2 8 2008

LINDA LINGLE
GOVERNOR

GEORGINA K. KAWAMURA
DIRECTOR

ROBERT N. E. PIPER
DEPUTY DIRECTOR

EMPLOYEES' RETIREMENT SYSTEM
HAWAII EMPLOYER-UNION HEALTH BENEFITS TRUST FUND
OFFICE OF THE PUBLIC DEFENDER
PUBLIC UTILITIES COMMISSION

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
P.O. BOX 150
HONOLULU, HAWAII 96810-0150

ADMINISTRATIVE AND RESEARCH OFFICE
BUDGET, PROGRAM PLANNING AND
MANAGEMENT DIVISION
FINANCIAL ADMINISTRATION DIVISION

July 24, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms Skog:

The Special Management Area (SMA) Application and Draft Environmental Assessment (EA) prepared pursuant to Chapter 343, Hawai'i Revised Statutes and Hawai'i Administrative Rules, Chapter 200 for the proposed expansion of Lahaina Civic Center Tennis Courts Complex in Lahaina, Maui, Hawai'I, has been reviewed. We have no comments to provide at this time.

If there are any questions regarding this matter, please contact Mr. Neal Miyahira, Administrator of the Budget, Program Planning and Management Division at (808) 586-1530.

Aloha,

Georgina K. Kawamura

GEORGINA K. KAWAMURA
Director of Finance

LINDA LINGLE
GOVERNOR

AUG 0 8 2008

KAREN SEDDON
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM
HAWAII HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY REFER TO:

08:PEO/101

August 6, 2008

Ms. Tamara Horcajo, Director
Department of Parks & Recreation
County of Maui
700 Hali'a Nakoa Street, Unit 2
Wailuku, Hawaii 96793

Attention: Baron Sumida

Dear Ms. Horcajo:

Re: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex, TMK Nos. (2) 4-5-021:010 (por.), 016 (por.), and 020 (por), Lahaina, Maui, Hawaii (SM1 2008 0015)

We have reviewed the Special Management Area application and Draft Environmental Assessment for the proposed expansion of the Lahaina Civic Center Tennis Courts Complex and have no comments to offer.

Thank you for the opportunity to comment.

Sincerely,

Karen Seddon
Executive Director

c: Jeffrey Hunt (Attn: Livit Callentine), Department of Planning
✓Kimberly Skog, Munekiyo & Hiraga, Inc.

JUL 17 2008

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

July 16, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96783

Dear Ms. Skog:

SUBJECT: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex
at TMK (2) 4-5-021:010 (por.), 016 (por.) and 020 (por.)
Lahaina, Maui, Hawaii (SM1 2008 0015)

The Department of Education has reviewed the Special Management (SMA) Application and Draft Environmental Assessment (DEA) for the proposed expansion of the tennis complex. We have no concern about the project and no comment to offer.

Should you have any questions, please call Heidi Meeker of the Facilities Development Branch at (808) 377-8301.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:jmb

cc: Randolph Moore, Assistant Superintendent, OSFSS
Duane Kashiwai, Public Works Administrator, FDB
CAS, Hana/Lahainaluna/Lanai/Molokai Complex Areas

AUG 0 6 2008

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M. D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

August 5, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 South High Street, Suite 104
Wailuku, Hawai`i 96793

Dear Ms. Skog:

Subject: **Proposed Expansion of Lahaina "Civic Center Tennis Courts Complex**
TMK: (2) 4-5-021: 010 (por.), 016 (por.), and 020 (por.)

Thank you for the opportunity to comment on the Draft Environmental Assessment (EA) and Special Management Area application for the expansion of the Lahaina Civic Center Tennis Courts Complex. Comments from this office were submitted during the early consultation process of the Draft EA. The comments were adequately addressed. We have no further comments to offer at this time.

It is strongly recommended that the Standard Comments found at the Department's website: http://hawaii.gov/health/environmental/env-planning/landuse/landuse.html be reviewed, and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please call me at 808 984-8230.

Sincerely,

Herbert S. Matsubayashi
District Environmental Health Program Chief

c: EPO

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

August 20, 2008

Herbert S. Matsubayashi
District Environmental Health Program Chief
Department of Health
State of Hawai`i
54 High Street
Wailuku, Hawai`i 96793

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Matsubayashi:

Thank you for your letter dated August 5, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

The applicant acknowledges that comments submitted by your office during the early consultation process were addressed in the Draft EA. As requested, standard comments relating to Environmental Health for Department of Health branches have been reviewed, and the applicant confirms that comments specifically applicable to the proposed project will be adhered to.

Thank you again for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
F:\DATA\RFE\LahainaCC Tennis\DOHMauiDEASMA.res.wpd

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

AUG 0 5 2008

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 1, 2008

Munekiyo & Hiraga, Inc.
305 High Street Suite 104
Wailuku, Hawaii 96793

Attention: Ms. Kimberly Skog

Gentlemen:

Subject: Proposed expansion of Lahaina Civic Center Tennis Courts Complex, Lahaina, Maui, Tax Map Key; (2) 4-5-21:por. 10, 16, 20

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Division of Aquatic Resources, Engineering Division, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 11, 2008

RECEIVED
LAND DIVISION
2008 JUL 31 P 2:53
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

'08 JUL 14 PM03:20 ENGINEERING

MEMORANDUM

TO: **DLNR Agencies:**
_x_ Div. of Aquatic Resources
__ ~~Div. of Boating & Ocean~~ Recreation
_x_ Engineering Division
__ ~~Div. of Forestry & Wildlife~~
__ Div. of State Parks
__ Commission on Water Resource Management
_x_ Office of Conservation & Coastal Lands
__ Land Division – District

FROM: Morris M. Atta
SUBJECT: Application for Special Management Area Use Permit for Proposed Lahaina civic Center Tennis Courts Complex Expansion
LOCATION: Lahaina, Maui, TMK: (2) 4-5-21:portion 10, 16, 20
APPLICANT: Munekiyo & Hiraga, Inc. on behalf of County of Maui

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed:
Date: 7/31/08

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LM/MorrisAtta
REF.:SMALahainaCIvicCenterTennisCourt
Maui.426

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone C. The National Flood Insurance Program does not have any regulations for developments within Zone C.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

(X) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments:_____

_____

( ) Other: _____

_____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 7/31/08

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RSC
AMV
SH

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES: 1719

DIRECTOR	√
COMM. FISH.	
AQ RES/ENV	
AQ REC	
PLANNER	
STAFF SVCS	
RCUH/UH	
STATISTICS	
AFRC/FED AID	
EDUCATION	
SECRETARY	
OFFICE SVCS	
TECH ASST	
Return to:	
No. Copies	
Copies to:	
Due Date:	

July 11, 2008

MEMORANDUM

TO: ~~DLNR Agencies:~~
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
x Office of Conservation & Coastal Lands
__Land Division – District

FROM: Morris M. Atta
SUBJECT: Application for Special Management Area Use Permit for Proposed Lahaina civic Center Tennis Courts Complex Expansion
LOCATION: Lahaina, Maui, TMK: (2) 4-5-21:portion 10, 16, 20
APPLICANT: Munekiyo & Hiraga, Inc. on behalf of County of Maui

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed:
Date: 29 July 2008

RECEIVED
2008 AUG -1 P 12:03
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

RECEIVED
JUL 4 2008
AQUATIC RESOURCES

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

August 20, 2008

Morris M. Atta
State of Hawai`i
Department of Land and
Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawai`i 96809

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Atta:

Thank you for your letter dated August 1, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments:

1. The applicant acknowledges your confirmation that the project site is located within Zone C, as indicated by the Flood Insurance Rate Map (FIRM). The applicant notes that there are no regulations for the National Flood Insurance Program (NFIP) for developments within this zone.

2. Via copy of this letter to the DLNR-Engineering Division, the applicant is providing the enclosed water usage figures from the preliminary engineering report so that they can be included in the State Water Projects Plan Update. See **Exhibit "A"**.

Thank you again for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
Enclosure
cc: Baron Sumida, Department of Parks and Recreation (w/ enclosure)
Livit Callentine, Department of Planning (w/ enclosure)
Clayton I. Yoshida, Department of Planning (w/ enclosure)
Eric T. Hirano, DLNR, Engineering Division (w/ enclosure)
F:\DATA\RFE\LahainaCC Tennis\DLNRDEASMA.res.wpd

improvements consist of relocation of a water meter manhole, relocation of a fire hydrant, water service lines, and drinking fountains. Wastewater system improvements include a sewer lateral for the existing tennis court restroom and the closure of its existing cesspool. Drainage system improvements consist of channels, inlets, manholes, drain pipe, and a subsurface detention/retention basin. Electrical system improvements include underground distribution lines for the lighting.

III. WATER SYSTEM

The County of Maui provides water service for the LCC. The existing distribution system within the civic center site includes 8-inch lines and fire hydrants. Existing water laterals tap into these main lines and serve various buildings and areas within the civic center. An existing 2-inch meter serves the existing tennis court restroom and surrounding area.

Water meter records for the existing 2-inch meter for the past three years show an average daily use of about 18,800 gallons per day. Estimated domestic use and irrigation use are about 1,100 gallons per day and 17,700 gallons per day, respectively. Projected water use will be based on an increase in domestic water demands due to more tennis court users, an increase in irrigation demands due to new landscape irrigation, and a decrease in current irrigation demands due to a reduction in the current irrigated area.

The projected domestic water use will be based on the number of tennis court users per hour, the number of available playing hours per day, percent of time the courts are used, and domestic water demand of 5 gallons per person. It is anticipated that each tennis court will be used by four persons per court per hour; that each tennis court will be available for play from 7:00 a.m. to 10:00 p.m. or 15 hours per day; and that the courts will be used 75 percent of the time. The projected domestic water use is therefore 900 gallons per day. (4 courts x 4 persons/court/hour x 15 hours/day x 0.75 x 5 gallons/person = 900 gallons/day)

The projected irrigation water use will be based on the area of new plantings and an average irrigation water application rate. Approximately 43,500 square feet of area will be planted and irrigated. Average irrigation demand based on grass is 5,800 gallons per day. Existing irrigation demands will be reduced by about 50 percent due to a reduction in planted area.

The total projected water use is therefore 16,700 gallons per day—a reduction of 2,100 gallons per day or about 11 percent of current usage. (1,100 + 900 + 17,700 – 8,850 + 5,800 = 16,650 ≈ 16,700 gallons per day) The existing water system, including the source, distribution system, meter, and service lines, can provide this amount.

Water system improvements include relocating the existing water meter, rerouting of existing water service lines between the water meter and the restroom, and installing a new irrigation system within the graded area.

EXHIBIT A

AUG 1 4 2008

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

HWY-PS
2.8858

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

August 13, 2008

Ms. Kimberly Skog
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

Subject: Special Management Area Use Permit and Draft Environmental Assessment
Proposed Lahaina Civic Center Tennis Courts Complex Expansion
Maui, Lahaina District, TMK: (2) 4-5-021:010(por.)

Thank you for consulting us on the subject project. We have the following comments:

1. We are satisfied with the Level of Service (LOS) calculations in the Traffic Impact Analysis Report (TIAR).

2. On page 11, N. (Summary and Conclusions), item 4c of the TIAR, it states that the intersection of Honoapiilani Highway with Kaanapali Parkway will operate at a LOS C during the AM peak hour and a LOS F during the PM peak hour, without and with project generated traffic. The TIAR should mention and identify roadway mitigation measures to improve the traffic LOS D or better for that intersection.

3. Applicant shall coordinate the review of the project construction plans with our Highways Division, Maui District Office.

If you have any questions, please contact Ken Tatsuguchi, Head Planning Engineer, Highways Division at (808) 587-1830.

Very truly yours,

for BRENNON T. MORIOKA, Ph.D., P.E.
Director of Transportation

c: Tamara Horcajo, DIR, Attn: Baron Sumida, Dept. of Parks and Recreation, County of Maui
Jeffrey Hunt, DIR, Attn: Livit Callentine, Dept. of Planning, County of Maui

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

September 23, 2008

Brennon T. Morioka, Director
Department of Transportation
State of Hawai`i
869 Punchbowl Street
Honolulu, Hawai`i 96813-5097

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Morioka:

Thank you for your letter dated August 13, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

1. It is affirmed that you have the applicant's assurances on this matter.

2. The requested modifications to the Traffic Impact Assessment Report (TIAR), regarding mitigation measures to improve the level of service at the intersection serving the project site, will be included as a letter of addendum from the traffic engineer to the original TIAR. Said letter will accompany the original TIAR in the Final EA for the subject project. See **Exhibit "A"**.

3. The applicant will be in contact with the Department's Highways Division, Maui District Office for coordinating the review of the project construction plans.

Again, thank you for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
Enclosure
cc: Baron Sumida, Department of Parks and Recreation (w/out enclosure)
Livit Callentine, Department of Planning (w/out enclosure)
F:\DATA\RFE\LahainaCC Tennis\SDOTDEASMA.res.wpd

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8206 FAX: (808) 239-4175 Email:prowell@hawaiiantel.net

September 23, 2008

Ronald M. Fukumoto Engineering, Inc.
1721 Wili Pa Loop, Suite 203
Wailuku, Maui, HI 96793

Attn: Mr. Ronald Fukumoto

Re: **Traffic Impact Assessment Report**
Proposed Lahaina Civic Center Tennis Courts
Response to Comments from State of Hawaii Department of Transportation

Dear Mr. Fukumoto:

This letter is a follow-up to our telephone conversation last Friday regarding a response to comments from State of Hawaii Department of Transportation regarding the TIAR for the proposed expansion of the Lahaina Civic Center Tennis Courts. State of Hawaii Department of Transportation commented that the "TIAR should mention and identify roadway mitigation measures to improve the traffic level-of-service D or better" at the intersection of Honoapiilani Highway at Kaanapali Parkway for afternoon peak hour conditions. I subsequently talked with the Planning Branch to confirm that the request was that mitigation should be identified and that any mitigation identified would not be imposed in the Lahaina Civic Center Tennis Court project. With this understanding, the following is my response.

The unacceptable level-of-service at the intersection of Honoapiilani Highway at Kaanapali Highway is the result of the heavy northbound and southbound traffic movements through the intersection. This in not traffic generated by the Kaanapali Resort but by projects north of the resort. This heavy through traffic also conflicts with the northbound left turns from Honoapiilani Highway into the resort. Some minor improvements to the eastbound and westbound approaches (such as double eastbound left turn lanes and a separate westbound left turn lane) are feasible and will improve the level-of-service slightly, but not enough the improve conditions from Level-of-Service F to Level-of-Service D.

Additional north-south capacity is needed or the north-south traffic volumes need to be reduced. First, widening of Honoapiilani Highway does not appear practical because of structures and adjacent (such and the overpass, railroad and parks)development and the widening will not be needed once the Lahaina Bypass is completed. The northbound volume should be reduced by approximately 10% and the southbound volume should be reduced by approximately 20% to improve the intersection conditions to Level-of-Service D.

This additional capacity and reduced volume along Honoapiilani Highway will most likely be provided when the Lahaina Bypass is completed. In the meantime, the roadway improvements noted above should be investigated further and an aggressive traffic management plan for all the projects north of and including the Kaanapali Resort should be pursued. Based on a recent traffic and parking survey at Kaanapali Resort, it is my understanding that significant numbers of employees have started using the Maui Bus rather than drive to work because of the increasing cost of operating a vehicle. We should take advantage of this situation to obtain the maximum benefit for traffic conditions in the area.

Very truly yours,
PHILLIP ROWELL AND ASSOCIATES

Phillip J. Rowell, P.E.
Principal

EXHIBIT "A"

AUG 1 1 2008

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD08/3675

August 6, 2008

Kimberly Skog, Planner
Munekiyo & Hiraga Inc.
305 High Street, Suite 104
Wailuku, HI 96793

RE: Request for comments on the Draft Environmental Assessment for the proposed expansion of the Lahaina Civic Center Tennis Courts Complex, Maui, TMKs: (2) 4-5-021: portions of 010, 016 and 020.

Aloha e Kimberly Skog,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated July 3, 2008. The County of Maui, Department of Parks and Recreation, proposes to expand its Lahaina Civic Center Tennis Courts Complex by adding four tennis courts, and associated fencing, lighting, windscreens, a parking lot and utilities. OHA has reviewed the project and offers the following comments.

We will rely on the applicant's assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the project, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

In addition, OHA recommends that the applicant use native vegetation in its landscaping plan for subject parcel. Landscaping with native plants furthers the traditional Hawaiian concept of mālama 'āina and creates a more Hawaiian sense of place.

Further, OHA notes that Parcels 10 and 16 are designated as Section 5(b) Ceded Lands, which hold a considerable amount of sentimental, historical and legal significance for Native Hawaiians and OHA. These lands were illegally taken from the Hawaiian Kingdom after the 1893 overthrow and later transferred ("ceded") by the United States government to the State of Hawai'i upon statehood. Today, the state holds the Ceded Lands corpus in trust for Native Hawaiians and the general public. We ask that future documents relating to this project indicate

the Ceded Lands status of these parcels to both assist the public review process and help keep track of Ceded Lands in the state's real property portfolio.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong by phone at (808) 594-0248 or e-mail him at sterlingw@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

C: OHA Maui CRC Office

Tamara Horcajo, Director
Maui County Department of Parks and Recreation
Attention: Baron Sumida
700 Hali'a Nakoa Street, Unit 2
Wailuku, HI 96793

Jeffrey Hunt, Director
Maui County Department of Planning
Attention: Livit Callentine
250 South High Street
Wailuku, HI 96793

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

August 20, 2008

Clyde W. Nāmu`o
State of Hawai`i
Office of Hawaiian Affairs
711 Kapi`olani Boulevard, Suite 500
Honolulu, Hawai`i 96813

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Nāmu`o:

Thank you for your letter dated August 6, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

1. It is affirmed that you have the applicant's assurances on this matter.

2. The applicant acknowledges the cultural and environmental significance of using native vegetation in landscaping for the proposed project. While native plants are best suited to the local environment, landscaping with native vegetation also contributes to the creation of a Hawaiian sense of place, thereby furthering the concept of Mālama`āina.

3. The applicant recognizes that Parcels 10 and 16 are designated as Section 5(b) Ceded Lands; therefore, in the interest of helping keep track of Ceded Lands in the State's real property portfolio and assisting the public review process, the Final EA for the subject project will document the Ceded Lands status of these two (2) parcels.

Again, thank you for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
F:\DATA\RFE\LahainaCC Tennis\OHADEASMA.res.wpd

LAND USE COMMISSION
Department of Business, Economic Development & Tourism
State of Hawai'i

July 18, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex
TMK Nos. (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.)
Lahaina, Maui, Hawaii (SM1 2008 0015)

We have reviewed the subject application forwarded by your letter dated July 3, 2008.

We have no comments to offer at this time. Thank you for the opportunity to comment on the subject application.

Should you have any questions, please feel free to call me or Michael Murphy of this office at 587-3822.

Sincerely,

ORLANDO DAVIDSON
Executive Officer

c: Jeffrey Hunt, Director, Department of Planning, County of Maui (Attention: Livit Callentine)
Tamara Horcajo, Director, Department of Parks and Recreation (Attention: Baron Sumida)

235 SOUTH BERETANIA STREET ❁ SUITE 406 ❁ HONOLULU, HAWAI'I 96813 ❁ TEL (808) 587-3822 ❁ FAX (808) 587-3827 ❁ EMAIL: luc@dbedt.hawaii.gov
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Kimberly Skog

From: Valeriano Martin [Valeriano.Martin@co.maui.hi.us]
Sent: Friday, August 15, 2008 4:55 PM
To: Kimberly Skog
Subject: Re: Proposed Lahaina Civic Center Tennis Complex Expansion -Comments on Draft EA

Kim,

I agree with the attached email.
-----Original Message-----
From: "Kimberly Skog" <Kimberly@mhplanning.com>
To: Valeriano Martin <Valeriano.Martin@co.maui.hi.us>

Sent: 8/15/2008 4:38:29 PM
Subject: Proposed Lahaina Civic Center Tennis Complex Expansion - Comments on Draft EA

Captain Martin,

This message is being sent to obtain written confirmation of our telephone conversation this past Wednesday, August 13, regarding comments from the Fire Prevention Bureau on the Draft Environmental Assessment (EA) for the subject project. As per your request, the comments submitted during the early consultation process will serve as your agency's comments on the Draft EA. On that basis, our response, issued on behalf of the applicant, County of Maui, Department of Parks and Recreation, will be based on your early consultation letter dated May 22, 2008.

Please reply to confirm. Should you have any questions or concerns, please feel free to contact me by phone or email. My contact information is provided below.

Mahalo,

Kim Skog

Kimberly Skog

Munekiyo & Hiraga, Inc.

305 High Street, Suite 104

Wailuku, Hawaii 96793

Telephone: (808) 244-2015

Facsimile: (808) 244-8729

Email: kim@mhplanning.com <mailto:kim@mhplanning.com.>

immediately by email or telephone. Thank you.

- -

County of Maui.
IT Security measures will reject attachments larger than 12 MB, and will block or quarantine high-risk file types in attachments.

MAY 2 7 2008

CHARMAINE TAVARES
MAYOR

JEFFREY A. MURRAY
CHIEF

ROBERT M. SHIMADA
DEPUTY CHIEF

COUNTY OF MAUI
DEPARTMENT OF FIRE AND PUBLIC SAFETY
FIRE PREVENTION BUREAU

780 ALUA STREET
WAILUKU, HAWAII 96793
(808) 244-9161
FAX (808) 244-1363

May 22, 2008

Munekiyo & Hiraga, Inc.
Attention: Kimberly Skog, Planner
305 High Street, Suite 104
Wailuku, Hawaii 96793

SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED EXPANSION OF LAHAINA CIVIC CENTER TENNIS COURTS COMPLEX, TMK (2)4-5-021:010, 016, and 020. LAHAINA, MAUI, HAWAII

Dear Ms. Skog,

I have had an opportunity to review the request for comments regarding the tennis courts project in Lahaina. We are excited about the new facilities for the public and support the project in general. The existing courts are close to the service road bordering the post office. Users of the existing courts park along the service road when playing tennis. With the addition of the new parking lot, will all players be required to park in the parking lot? Would it be in the public's best interest to prohibit parking along the service road leading to the emergency services?

As you are well aware, three emergency service agencies utilize the roadway with emergency vehicles. At times, a fire truck that is responding to Lahaina town needs to make way for vehicles traveling uphill towards the Civic Center. In any case, a slight delay is possible. I would not consider this to be a tremendous problem or concern but mostly an inconvenience and delayed response on the part of the emergency personnel responding. There is enough room if someone pulls to the side when cars are parked. A detailed look at this topic would be welcomed and appreciated. Please feel free to contact me if there are any questions or concerns regarding these comments.

Sincerely,

Valeriano F. Martin
Captain
Fire Prevention Bureau

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

September 10, 2008

Valeriano F. Martin, Captain
County of Maui
Department of Fire and Public Safety
Fire Prevention Bureau
780 Alua Street
Wailuku, Hawai`i 96793

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Captain Martin:

Thank you for resubmitting your letter of May 22, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, to follow up on the applicant's initial response dated June 13, 2008, we wish to provide the following information.

The applicant has reviewed the current parking conditions along the service road to the Lahaina Civic Center (LCC) with members of the Lahaina Fire Station, and with the medics and ambulance crews stationed at the LCC. It is recognized that the makai (southbound) lane of the service road must be kept clear to ensure uninhibited access to Honoapi`ilani Highway by emergency response teams. To this end, it has been agreed that the applicant will assess the parking along the service road upon completion of the project, coordinate with pertinent agencies regarding the project's effect on emergency access along the service road, and if necessary, implement measures to ensure unihibited access along the service road. In addition, as noted in the applicant's early consultation response letter, it is anticipated that the additional 25 stalls will help alleviate public parking along the service road.

Again, thank you for your comments and support for the proposed project. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
F:\DATA\RFE\LahainaCC Tennis\FireDEASMA.res.wpd

JUL 1 6 2008

CHARMAINE TAVARES
MAYOR

DON A. MEDEIROS
Director
WAYNE A. BOTEILHO
Deputy Director
Telephone (808) 270-7511
Facsimile (808) 270-7505

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

July 10, 2008

Ms. Kimberly Skog
Munekiyo & Hiraga, Inc.
305 South High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK Nos. (2)4-5-021:10

Dear Ms. Skog,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,

Don Medeiros
Director

JUL 1 6 2008

DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
COUNTY OF MAUI

CHARMAINE TAVARES
Mayor

VANESSA A. MEDEIROS
Director

LORI TSUHAKO
Deputy Director

200 SOUTH HIGH STREET • WAILUKU, HAWAII 96793 • PHONE (808) 270-7805 • FAX (808) 270-7165 • EMAIL director.hhc@mauicounty.gov

July 10, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

SUBJECT: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.), Lahaina, Maui, Hawaii (SM1 2008 0015)

We have reviewed the Special Management Area (SMA) application and Draft Environmental Assessment (EA) for the above subject project and wish to inform you that this Department has no comment to offer.

Thank you for the opportunity to comment.

Sincerely,

Vanessa A Medeiros

VANESSA A. MEDEIROS
Director of Housing and Human Concerns

xc: Tamara Horcajo, Dept. of Parks and Recreation
Jeffrey Hunt, Dept. of Planning
Housing Division

CHARMAINE TAVARES
Mayor

JEFFREY S. HUNT
Director

COLLEEN M. SUYAMA
Deputy Director

AUG 0 1 2008

COUNTY OF MAUI
DEPARTMENT OF PLANNING

July 28, 2008

Ms. Kimberly Skog
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Skog:

SUBJECT: **COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE PROPOSED EXPANSION OF THE LAHAINA CIVIC CENTER, TENNIS COURT COMPLEX LOCATED AT LAHAINA, MAUI, HAWAII, TMK: (2) 4-5-021:010, 016 POR., AND 020 POR., (EAC 2008/0031)**

The Department of Planning (Department) is in receipt of the above-referenced document for the proposed Lahaina Civic Center Tennis Court Complex. The Department understands the proposed action includes the following:

1. The applicant is the County of Maui Department of Parks and Recreation;

2. The proposed improvements are the construction of four (4) tennis courts with sports lighting, fencing, windscreens, a 25-stall paved parking lot with lighting, accessible walkways with lighting, retaining walls, landscape planting/irrigation, and site improvements; and

3. The anticipated site improvements are to water, wastewater, drainage, and electrical systems. Water system improvements anticipated are the relocation of the water meter manhole and fire hydrant, water services lines, and drinking fountains. Wastewater system improvements anticipated are the closure of the restroom cesspool and the installation of a sewer lateral. Drainage system improvements anticipated are channels, inlets, manholes, drain pipe, and a subsurface detention/retention basin. Electrical improvements anticipated are underground distribution lines for the lights.

Based on the foregoing, the Department provides the following comments on the DEA:

1. The land use designations for the project area are as follows:

   a. State Land Use – Urban
   b. Community Plan – Public/Quasi-Public
   c. County Zoning – Agriculture
   d. Other – Special Management Area

2. The Department encourages the applicant to work with the Maui District Tennis Association contacts, listed below, in order to incorporate their input into the design and future use of the tennis facilities. The Maui District Tennis Association has been actively involved in the county planning processes for the west side of Maui.

   a. Elaine Gallant
   Save Our Courts Committee Chair
   Maui District Tennis Association
   167 Kualapa Place
   Lahaina, HI 96761
   (808) 667-2038
   Egallant@hawaii.rr.com

   b. Chris Scharein, President
   Maui District Tennis Association
   P.O. Box 373
   Kahului, HI 96733
   (808) 667-6937
   mdtahawaii@hotmail.com

Thank you for providing the opportunity to comment. Should you require further clarification, please contact Staff Planner Livit Callentine by email at livit.callentine@mauicounty.gov or by phone at (808) 270-5537.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

For: JEFFREY S. HUNT, AICP
Planning Director

xc: Livit U. Callentine, Staff Planner
Tamara Horcajo, Department of Parks and Recreation
Baron Sumida, Department of Parks and Recreation
Ronald M. Fukumoto, Ronald M. Fukumoto Engineering, Inc
Elaine Gallant, Save Our Courts Committee Chair, Maui District Tennis Association
Chris Scharein, President, Maui District Tennis Association
TMK File
General File

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MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

August 20, 2008

Jeffrey S. Hunt, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawai`i 96793

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Hunt:

Thank you for your letter dated July 28, 2008 providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

1. We note that the zoning and flood confirmation form for the project site reflects community plan designations of "Public/Quasi-Public" and "Agricultural". See **Exhibit "A"**. For Chapter 343, Hawai`i Revised Statutes purposes, we will assume that the land use designations reflected on the zoning and flood confirmation form are acceptable.

2. The applicant has been working with the Maui District Tennis Association in developing plans for the proposed expansion. As the applicant is seeking to provide tennis facilities for future use in West Maui, the applicant understands the importance of securing input from the Maui District Tennis Association.

Thank you again for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
Enclosure
cc: Baron Sumida, Department of Parks and Recreation (w/enclosure)
Livit Callentine, Department of Planning (w/enclosure)
Clayton I. Yoshida, Department of Planning (w/enclosure)
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JUN 1 1 2008

COUNTY OF MAUI
DEPARTMENT OF PLANNING
Kalana Paku`i Building
250 South High Street
Wailuku, Hawaii 96793

Zoning Administration
and Enforcement Division
Telephone: (808) 270-7253
Facsimile: (808) 270-7634
E-mail: planning@mauicounty.gov

ZONING AND FLOOD CONFIRMATION

APPLICANT INFORMATION: (To be completed by Applicant)			
APPLICANT	*Munekiyo & Hiraga, Inc. (on behalf of Department of Parks and Recereation)*		
TELEPHONE	*(808) 244-2015*	E-MAIL	*planning@mhplanning.com*
PROJECT NAME	*Lahaina Civic Center Tennis Courts Complex*		
ADDRESS/LOCATION	*Mauka side of Honoapi'ilani Highway, directly east of the Lahaina Post Office*		
TAX MAP KEY NO(S)	*(2) 4-5-021:020*		

ZONING INFORMATION: (To be completed by ZAED)	
COMMUNITY PLAN DESIGNTION(S)	*Agricultural*
COUNTY ZONING(S)	*Agricultural*
STATE LAND USE DISTRICT(S)	*Urban*
SPECIAL DISTRICT(S)	*Special Management Area (SMA) portion*

FLOOD INFORMATION: (To be completed by ZAED)		
FLOOD HAZARD AREA ZONE(S)	*C*	
BASE FLOOD ELEVATION(S)	*N.A.*	mean sea level, 1929 National Geodetic Vertical Datum; or
For Flood Zone AO, FLOOD DEPTH	*N.A.*	
FLOODWAY	☐ Yes	☒ No
FLOOD DEVELOPMENT PERMIT REQUIRED	☐ Yes	☒ No

*For flood hazard area zones B or C; a flood development permit would be required if any work is done in any drainage facility or stream area that would reduce the capacity of the drainage facility, river, or stream, or adversely affect downstream property.

FOR COUNTY USE ONLY

REMARKS/COMMENTS:

☐ Additional information required
☐ Required for Agricultural Subdivisions Agricultural Assessment RFS No:
☐ Information submitted is correct
☐ Correction has been made and initialed

Reviewed and Confirmed by:

Russell T. Higa	*06/10/08*
(Signature)	(Date)

For AARON SHINMOTO, Planning Program Administrator
Zoning Administration and Enforcement Division

EXHIBIT "A"

COUNTY OF MAUI
DEPARTMENT OF PLANNING
Kalana Paku`i Building
250 South High Street
Wailuku, Hawaii 96793

Zoning Administration
and Enforcement Division
Telephone: (808) 270-7253
Facsimile: (808) 270-7634
E-mail: planning@mauicounty.gov

ZONING AND FLOOD CONFIRMATION

APPLICANT INFORMATION (To be completed by Applicant)			
APPLICANT	*Munekiyo & Hiraga, Inc. (on behalf of Department of Parks and Recereation)*		
TELEPHONE	*(808) 244-2015*	E-MAIL	*planning@mhplanning.com*
PROJECT NAME	*Lahaina Civic Center Tennis Courts Complex*		
ADDRESS/LOCATION	*Mauka side of Honoapi'ilani Highway, directly east of the Lahaina Post Office*		
TAX MAP KEY NO(S)	*(2) 4-5-021:016*		
ZONING INFORMATION (To be completed by ZAED)			
COMMUNITY PLAN DESIGNTION(S)	*Public/Quasi-Public*		
COUNTY ZONING(S)	*Agricultural*		
STATE LAND USE DISTRICT(S)	*Agricultural & Urban*		
SPECIAL DISTRICT(S)	*Special Management Area (SMA) portion*		
FLOOD INFORMATION (To be completed by ZAED)			
FLOOD HAZARD AREA ZONE(S)	*C*		
BASE FLOOD ELEVATION(S)	*N.A.*	mean sea level, 1929 National Geodetic Vertical Datum; or	
For Flood Zone AO, FLOOD DEPTH	*N.A.*		
FLOODWAY	☐ Yes	☒ No	
FLOOD DEVELOPMENT PERMIT REQUIRED	☐ Yes	☒ No	

*For flood hazard area zones B or C; a flood development permit would be required if any work is done in any drainage facility or stream area that would reduce the capacity of the drainage facility, river, or stream, or adversely affect downstream property.

FOR COUNTY USE ONLY

REMARKS/COMMENTS

☐ Additional information required
☐ Required for Agricultural Subdivisions
Agricultural Assessment RFS No:
☐ Information submitted is correct
☐ Correction has been made and initialed

Reviewed and Confirmed by:

Russell T. Higa	*06/10/08*
(Signature)	(Date)

For AARON SHINMOTO, Planning Program Administrator
Zoning Administration and Enforcement Division

JUN 1 1 2008

COUNTY OF MAUI
DEPARTMENT OF PLANNING
Kalana Paku`i Building
250 South High Street
Wailuku, Hawaii 96793

Zoning Administration
and Enforcement Division
Telephone: (808) 270-7253
Facsimile: (808) 270-7634
E-mail: planning@mauicounty.gov

ZONING AND FLOOD CONFIRMATION

APPLICANT INFORMATION (To be completed by Applicant)			
APPLICANT	*Munekiyo & Hiraga, Inc. (on behalf of Department of Parks and Recereation)*		
TELEPHONE	*(808) 244-2015*	E-MAIL	*planning@mhplanning.com*
PROJECT NAME	*Lahaina Civic Center Tennis Courts Complex*		
ADDRESS/LOCATION	*Mauka side of Honoapi'ilani Highway, directly east of the Lahaina Post Office*		
TAX MAP KEY NO(S)	*(2) 4-5-021:010*		

ZONING INFORMATION (To be completed by ZAED)	
COMMUNITY PLAN DESIGNTION(S)	*Public/Quasi-Public*
COUNTY ZONING(S)	*Agricultural*
STATE LAND USE DISTRICT(S)	*Agricultural & Urban*
SPECIAL DISTRICT(S)	*Special Management Area (SMA)*

FLOOD INFORMATION (To be completed by ZAED)		
FLOOD HAZARD AREA ZONE(S)	*C*	
BASE FLOOD ELEVATION(S)	*N.A.*	mean sea level, 1929 National Geodetic Vertical Datum; or
For Flood Zone AO, FLOOD DEPTH	*N.A.*	
FLOODWAY	☐ Yes ☒ No	
FLOOD DEVELOPMENT PERMIT REQUIRED	☐ Yes ☒ No	

*For flood hazard area zones B or C; a flood development permit would be required if any work is done in any drainage facility or stream area that would reduce the capacity of the drainage facility, river, or stream, or adversely affect downstream property.

FOR COUNTY USE ONLY

REMARKS/COMMENTS

☐ Additional information required
☐ Required for Agricultural Subdivisions Agricultural Assessment RFS No:
☐ Information submitted is correct
☐ Correction has been made and initialed

Reviewed and Confirmed by:

Russell T. Higa	*06/10/08*
(Signature)	(Date)

For AARON SHINMOTO, Planning Program Administrator
Zoning Administration and Enforcement Division

AUG 0 4 2008

POLICE DEPARTMENT
COUNTY OF MAUI

CHARMAINE TAVARES
MAYOR

OUR REFERENCE
YOUR REFERENCE ti

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

THOMAS M. PHILLIPS
CHIEF OF POLICE

GARY A. YABUTA
DEPUTY CHIEF OF POLICE

July 31, 2008

Ms. Kimberly Skog
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Skog

SUBJECT: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK Nos. (2) 4-5-0211:010 (por.), 016 (por.), and 020 (por.), Lahaina, Maui (SM1 2008 0015)

This is in response to your letter July 3, 2008, requesting comments on the above subject.

We have reviewed the information for the above mentioned subject and offer the enclosed comments.

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

Very truly yours,

Ac Wayne T. Ribao

Assistant Chief Wayne T. Ribao
for: Thomas M. Phillips
Chief of Police

c: Jeffrey Hunt, Maui County Dept. of Planning

COPY

TO : **THOMAS PHILLIPS, CHIEF OF POLICE**

VIA : **CHANNELS** 7/29/08

FROM : **RICKY UEDOI, SERGEANT, LAHAINA PATROL**

CONCUR:
AC [illegible]
07/31/08

SUBJECT : **PROPOSED EXPANSION OF LAHAINA CIVIC CENTER TENNIS COURTS**

The following comments are being offered in regards to the proposed expansion of the Lahaina Civic Tennis Courts Complex.

In review of the Special Management Area (SMA) Application and Draft Environmental Assessment (EA) submitted by Munekiyo & Hiraga, Inc., on behalf of the County of Maui, Department of Parks and Recreation, the proposed expansion to the tennis complex consists of four tennis courts with sports lighting, fencing, and windscreens; a 25 stall paved parking lot with lighting; accessible walkways with lighting; retaining walls; landscape plantings and irrigation, and site utilities.

The paved parking stalls would be a welcome addition to the area. Currently, parking for users of the tennis complex have to park on Ka'a'ahi Street. With the parking lot, this would free Ka'a'ahi Street and provide wide travel lanes for vehicles.

There would be no significant impact to police services with this proposed project.

Submitted for your review.

Respectfully submitted,

Sgt. Ricky C. Uedoi #1512
Lahaina Patrol Division
July 29, 2008 @ 0645 hours

JUL 3 1 2008

CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
200 SOUTH HIGH STREET, ROOM NO. 434
WAILUKU, MAUI, HAWAII 96793

July 25, 2008

Ms. Kimberly Skog, Planner
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Ms. Skog:

SUBJECT: SPECIAL MANAGEMENT AREA APPLICATION AND DRAFT ENVIRONMENTAL ASSESSMENT FOR PROPOSED EXPANSION OF LAHAINA CIVIC CENTER TENNIS COURTS COMPLEX; TMK: (2) 4-5-021:010 (POR), 016 (POR), AND 020 (POR)
SM1 2008/0015

We reviewed the subject application and have only one (1) comment.

1. Obtain necessary building permits.

Please call Michael Miyamoto at 270-7845 if you have any questions regarding this letter.

Sincerely,

MILTON M. ARAKAWA, A.I.C.P.
Director of Public Works

MMA:MMM:ls
xc: Highways Division
Engineering Division
Tamara Horcajo, Director, Department of Parks and Recreation
Jeffrey Hunt, Director, Department of Planning

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

August 20, 2008

Milton M. Arakawa, Director
Department of Public Works
County of Maui
200 South High Street, Room 434
Wailuku, Hawaii 96793

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Arakawa:

Thank you for your letter dated July 25, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comment.

The applicant confirms that, as applicable, the necessary building permits will be obtained.

Thank you again for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
F:\DATA\RFE\LahainaCC Tennis\DPWDEASMA.res.wpd

AUG 0 7 2008

CHARMAINE TAVARES
Mayor

CHERYL K. OKUMA, Esq.
Director

GREGG KRESGE
Deputy Director

TRACY TAKAMINE, P.E.
Solid Waste Division

DAVID TAYLOR, P.E.
Wastewater Reclamation Division

COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2200 MAIN STREET, SUITE 100
WAILUKU, MAUI, HAWAII 96793

August 5, 2008

Ms. Kimberly Skog
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

SUBJECT: LAHAINA CIVIC CENTER TENNIS COURTS COMPLEX EXPANSION SMA AND DRAFT EA
TMK (2) 4-5-021:010 (POR.), 016 (POR.), AND 020 (POR.)

Dear Ms. Skog,

We reviewed the subject project as a pre-application consultation and have the following comments:

1. Solid Waste Division comments:

   a. None.

2. Wastewater Reclamation Division (WWRD) comments:

   a. Although wastewater system capacity is currently available as of 8/5/2008, the developer should be informed that wastewater system capacity cannot be ensured until the issuance of the building permit.
   b. Wastewater contribution calculations are required before building permit is issued.
   c. Developer is not required to pay assessment fees for this area at the current time.
   d. Developer is required to fund any necessary off-site improvements to collection system and wastewater pump stations.
   e. Show or list minimum slope of new sewer laterals.
   f. Plans should show the installation of a single service lateral and advanced riser for each lot.

g. Indicate on the plans the ownership of each easement (in favor of which party). Note: County will not accept sewer easements that traverse private property.

If you have any questions regarding this memorandum, please contact Gregg Kresge at 270-8230.

Sincerely,

Cheryl K. Okuma

Cheryl Okuma, Director

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

September 22, 2008

Cheryl Okuma, Director
Department of Environmental Management
County of Maui
2200 Main Street, Suite 100
Wailuku, Hawai`i 93793

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Ms. Okuma:

Thank you for your letter dated August 5, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

1. The applicant acknowledges that although wastewater system capacity was available as of the date of your memorandum, wastewater system capacity cannot be ensured until the issuance of the building permit.

2. The applicant confirms wastewater calculations for the proposed project will be carried out by a licensed civil engineer and shall be submitted with the building permit application.

3. The applicant understands that assessment fees for this area are not required at this time.

4. The applicant accepts the responsibility of funding any necessary improvements, as applicable.

5. The minimum slope of new sewer laterals will be put forth in the construction document.

6. The plans will show the connection details, as required.

7. The construction plans will be prepared to indicate the ownership of each easement with respect to each party. The applicant acknowledges that sewer easements are not to traverse private properties.

Thank you again for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
F:\DATA\RFE\LahainaCC Tennis\DEMDEASMA.res.wpd

SEP 0 8 2008

CHARMAINE TAVARES
Mayor

JEFFREY K. ENG
Director

ERIC H. YAMASHIGE, P.E., L.S.
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

August 27, 2008

Ms. Kimberly Skog, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

SUBJECT: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex at TMK (2) 4-5-021:010 (por), 016 (por) and 020 (por),

Dear Ms. Skog:

Thank you for the opportunity to review this project proposal.

Source Availability and Consumption
The project area is served by our Lahaina system. The main sources of water for this portion of the system are wells withdrawing from Launiupoko aquifer and surface water from Kanaha Stream. DWS does not grant or imply any guarantee of water until an application for water meter has been received and reviewed. Additional water for development is not currently available at the Lahaina system pending completion of new source projects. However, water availability will be determined at time of meter application. Should a larger or additional meters be required, the Department does not guarantee that additional source will be available for this project.

The project site is served by a 1½-inch water meter, not 2-inch as indicated in the Preliminary Engineering Report. The existing facility has an average daily domestic use of approximately 4,300 gallons. The proposed expansion area encompasses 2 acres, half of which will be planted and irrigated with water from an existing Parks Department well. Based on system standards anticipated increase in use would be 3,400 gpd. However, the applicant's estimate of 900 gpd on DWS system is probably reasonable given that irrigation will be from a Parks Department well on site.

System Infrastructure
The project site is served by 8-inch distribution lines and several fire hydrants on-site. The applicant should contact our Engineering Division to discuss the proposed water system improvements included in the Preliminary Engineering Report.

Conservation

In order to reduce demand in the Lahaina system, we recommend that native plants be utilized to the maximum extent for landscaping. Native plants adapted to the area, conserve water and protect the watershed from degradation due to invasive alien species. The project is located in the Maui County Planting Plan - Plant Zones 3 & 5. Attached is a list of appropriate plants for the zones as well as potentially invasive plants to avoid for reference.

Additional water conservation measures are listed below and should be implemented:

Use brackish and/or reclaimed water sources for dust control and for all non-potable water uses during various phases of construction.

Utilize Low-Flow Fixtures and Devices: Maui County Code Subsection 16.20A.680 requires the use of low-flow water fixtures and devices in faucets, showerheads, urinals, water closets, and hose bibs.

Maintain Fixtures to Prevent Leaks: A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day. Refer to the attached handout, "The Costly Drip". The applicant should establish a regular maintenance program.

Limit Irrigated Turf: Limit irrigated turf to 25% or less of total landscaped area. Low-water use shrubs and ground covers can be equally attractive and require substantially less water that turf.

Look for Opportunities to Conserve Water: A few examples of these are as follows: When clearing driveways, etc. of debris, use a broom instead of a hose; check for leaks in faucets and toilet tanks.

Pollution Prevention

The project overlies the Honokowai aquifers with an estimated sustainable yield of 8 MGD of potable water. In order to protect ground and surface water resources, we recommend that the applicant utilize Best Management Practices (BMPs) designed to minimize infiltration and runoff from construction and vehicle operations. We have attached sample BMPs for principle operations for reference. The following mitigation measures should be implemented during construction:

1. Prevent cement products, oil, fuel and other toxic substances from falling or leaching into the water.
2. Properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work.
3. Retain ground cover until the last possible date.
4. Stabilize denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments, fertilizers and temporary irrigation. Use high seeding rates to ensure rapid stand establishment.
5. Avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical run-off.
6. Keep run-off on site.

Should you have any questions regarding system infrastructure and requirements, please call our Engineering Division at 270-7835 and any questions on source availability or conservation and resource matters, please contact our Water Resources and Planning Division at 244-8550.

Sincerely,

Jeffrey K. Eng
Director

eam
c: engineering division
applicant, with attachments:
The Costly Drip
Maui County Planting Plan - Saving Water in the Yard - What and How to Plant in your Area
Ordinance No. 2108 - A Bill for an Ordinance Amending Chapter 16.20 of the Maui County Code, Pertaining to the Plumbing Code
Selected BMP's from "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters"-EPA

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"THE COSTLY DRIP"

Slowly Dripping
Spigot Wastes
15 Gallons a day.

1/32" Leak Wastes
25 Gallons a day.

1/16" Stream Wastes
100 Gallons a Day.

1/8" Stream Wastes
400 Gallons a day.

United States
Environmental Protection
Agency

Office of Water
Washington, DC 20460

840-B-92-002
January 1993

EPA

Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters

Issued Under the Authority of
Section 6217(g) of the Coastal Zone Act
Reauthorization Amendments of 1990

III. CONSTRUCTION ACTIVITIES

A. Construction Site Erosion and Sediment Control Management Measure

(1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and

(2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

1. Applicability

This management measure is intended to be applied by States to all construction activities on sites less than 5 acres in areas that do not have an NPDES permit[3] in order to control erosion and sediment loss from those sites. This management measure does not apply to: (1) construction of a detached single family home on a site of 1/2 acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. (NOTE: All construction activities, including clearing, grading, and excavation, that result in the disturbance of areas greater than or equal to 5 acres or are a part of a larger development plan are covered by the NPDES regulations and are thus excluded from these requirements.) Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The goal of this management measure is to reduce the sediment loadings from construction sites in coastal areas that enter surface waterbodies. This measure requires that coastal States establish new or enhance existing State erosion and sediment control (ESC) programs and/or require ESC programs at the local level. It is intended to be part of a comprehensive land use or watershed management program, as previously detailed in the Watershed and Site Development Management Measures. It is expected that State and local programs will establish criteria determined by local conditions (e.g., soil types, climate, meteorology) that reduce erosion and sediment transport from construction sites.

Runoff from construction sites is by far the largest source of sediment in urban areas under development (York County Soil and Water Conservation District, 1990). Soil erosion removes over 90 percent of sediment by tonnage in urbanizing areas where most construction activities occur (Canning, 1988). Table 4-14 illustrates some of the

[3] On May 27, 1992, the United States Court of Appeals for the Ninth Circuit invalidated EPA's exemption of construction sites smaller than 5 acres from the storm water permit program in *Natural Resources Defense Council* v. *EPA*, 965 F.2d 759 (9th Cir. 1992). EPA is conducting further rulemaking proceedings on this issue and will not require permit applications for construction activities under 5 acres until further rulemaking has been completed.

measured sediment loading rates associated with construction activities found across the United States. As seen in Table 4-14, erosion rates from natural areas such as undisturbed forested lands are typically less than one ton/acre/year, while erosion from construction sites ranges from 7.2 to over 1,000 tons/acre/year.

Table 4-14. Erosion and Sediment Problems Associated With Construction

Location	Problem	Reference
United States	Sediment loading rates vary from 36.5 to 1,000 ton/ac/yr. These are 5 to 500 times greater than those from undeveloped land. Approximately 600 million tons of soil erodes from developed sites each year. Construction site sediment in runoff can be 10 to 20 times greater than that from agricultural lands.	York County Soil and Water Conservation District, 1990
Franklin County, FL	Sediment yield (ton/ac/yr): forest < 0.5 rangeland < 0.5 tilled 1.4 construction site 30 established urban < 0.5	Franklin County, FL
Wisconsin	Erosion rates range from 30 to 200 ton/ac/yr (10 to 20 times those of cropland).	Wisconsin Legislative Council, 1991
Washington, DC	Erosion rates range from 35 to 45 ton/ac/yr (10 to 100 times greater than agriculture and stabilized urban land uses).	MWCOG, 1987
Anacostia River Basin, VA, MD, DC	Sediment yields from portions of the Anacostia Basin have been estimated at 75,000 to 132,000 ton/yr.	U.S. Army Corps of Engineers, 1990
Washington	Erosion rates range from 50 to 500 ton/ac/yr. Natural erosion rates from forests or well-sodded prairies are 0.01 to 1.0 ton/ac/yr.	Washington Department of Ecology, 1989
Anacostia River Basin, VA, MD, DC	Erosion rates range from 7.2 to 100.8 ton/ac/yr.	USGS, 1978
Alabama	1.4 million tons eroded per year.	Woodward-Clyde, 1991
North Carolina	6.7 million tons eroded per year.	
Louisiana	5.1 million tons eroded per year.	
Oklahoma	4.2 million tons eroded per year.	
Georgia	3.8 million tons eroded per year.	
Texas	3.5 million tons eroded per year.	
Tennessee	3.3 million tons eroded per year.	
Pennsylvania	3.1 million tons eroded per year.	
Ohio	3.0 million tons eroded per year.	
Kentucky	3.0 million tons eroded per year.	

Eroded sediment from construction sites creates many problems in coastal areas including adverse impacts on water quality, critical habitats, submerged aquatic vegetation (SAV) beds, recreational activities, and navigation (APWA, 1991). For example, the Miami River in Florida has been severely affected by pollution associated with upland erosion. This watershed has undergone extensive urbanization, which has included the construction of many commercial and residential buildings over the past 50 years. Sediment deposited in the Miami River channel contributes to the severe water quality and navigation problems of this once-thriving waterway, as well as Biscayne Bay (SFWMD, 1988).

ESC plans are important for controlling the adverse impacts of construction and land development and have been required by many State and local governments, as shown in Table 4-13 (in the Site Development section of this chapter). An ESC plan is a document that explains and illustrates the measures to be taken to control erosion and sediment problems on construction sites (Connecticut Council on Soil and Water Conservation, 1988). It is intended that existing State and local erosion and sediment control plans may be used to fulfill the requirements of this management measure. Where existing ESC plans do not meet the management measure criteria, inadequate plans may be enhanced to meet the management measure guidelines.

Typically, an ESC plan is part of a larger site plan and includes the following elements:

- Description of predominant soil types;
- Details of site grading including existing and proposed contours;
- Design details and locations for structural controls;
- Provisions to preserve topsoil and limit disturbance;
- Details of temporary and permanent stabilization measures; and
- Description of the sequence of construction.

ESC plans ensure that provisions for control measures are incorporated into the site planning stage of development and provide for the reduction of erosion and sediment problems and accountability if a problem occurs (York County Soil and Water Conservation District, 1990). An effective plan for urban runoff management on construction sites will control erosion, retain sediments on site, to the extent practicable, and reduce the adverse effects of runoff. Climate, topography, soils, drainage patterns, and vegetation will affect how erosion and sediment should be controlled on a site (Washington State Department of Ecology, 1989). An effective ESC plan includes both structural and nonstructural controls. Nonstructural controls address erosion control by decreasing erosion potential, whereas structural controls are both preventive and mitigative because they control both erosion and sediment movement.

Typical nonstructural erosion controls include (APWA, 1991; York County Soil and Water Conservation District, 1990):

- Planning and designing the development within the natural constraints of the site;
- Minimizing the area of bare soil exposed at one time (phased grading);
- Providing for stream crossing areas for natural and man-made areas; and
- Stabilizing cut-and-fill slopes caused by construction activities.

Structural controls include:

- Perimeter controls;
- Mulching and seeding exposed areas;
- Sediment basins and traps; and
- Filter fabric, or silt fences.

Some erosion and soil loss are unavoidable during land-disturbing activities. While proper siting and design will help prevent areas prone to erosion from being developed, construction activities will invariably produce conditions where erosion may occur. To reduce the adverse impacts associated with construction, the construction management measure suggests a system of nonstructural and structural erosion and sediment controls for incorporation into an

ESC plan. Erosion controls have distinct advantages over sediment controls. Erosion controls reduce the amount of sediment transported off-site, thereby reducing the need for sediment controls. When erosion controls are used in conjunction with sediment controls, the size of the sediment control structures and associated maintenance may be reduced, decreasing the overall treatment costs (SWRPC, 1991).

3. Management Measure Selection

This management measure was selected to minimize sediment being transported outside the perimeter of a construction site through two broad performance goals: (1) **reduce** erosion and (2) **retain** sediment onsite, to the extent practicable. These performance goals were chosen to allow States and local governments flexibility in specifying practices appropriate for local conditions.

While several commentors responding to the draft (May 1991) guidance expressed the need to define "more measurable, enforceable ways" to control sediment loadings, other commentors stressed the need to draft management measures that do not conflict with existing State programs and allow States and local governments to determine appropriate practices and design standards for their communities. These management measures were selected because virtually all coastal States control construction activities to prevent erosion and sediment loss.

The measures were specifically written for the following reasons:

(1) Predevelopment loadings may vary greatly, and some sediment loss is usually inevitable;

(2) Current practice is built on the use of systems of practices selected based on site-specific conditions; and

(3) The combined effectiveness of erosion and sediment controls in systems is not easily quantified.

4. Erosion Control Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Erosion controls are used to reduce the amount of sediment that is detached during construction and to prevent sediment from entering runoff. Erosion control is based on two main concepts: (1) disturb the smallest area of land possible for the shortest period of time, and (2) stabilize disturbed soils to prevent erosion from occurring.

a. Schedule projects so clearing and grading are done during the time of minimum erosion potential.

Often a project can be scheduled during the time of year that the erosion potential of the site is relatively low. In many parts of the country, there is a certain period of the year when erosion potential is relatively low and construction scheduling could be very effective. For example, in the Pacific region if construction can be completed during the 6-month dry season (May 1 - October 31), temporary erosion and sediment controls may not be needed. In addition, in some parts of the country erosion potential is very high during certain parts of the year such as the spring thaw in northern areas. During this time of year, melting snowfall generates a constant runoff that can erode soil. In addition, construction vehicles can easily turn the soft, wet ground into mud, which is more easily washed offsite. Therefore, in the north, limitations should be placed on grading during the spring thaw (Goldman et al., 1986).

b. Stage construction.

Avoid areawide clearance of construction sites. Plan and stage land disturbance activities so that only the area currently under construction is exposed. As soon as the grading and construction in an area are complete, the area should be stabilized.

By clearing only those areas immediately essential for completing site construction, buffer zones are preserved and soil remains undisturbed until construction begins. Physical markers, such as tape, signs, or barriers, indicating the limits of land disturbance, can ensure that equipment operators know the proposed limits of clearing. The area of the watershed that is exposed to construction is important for determining the net amount of erosion. Reducing the extent of the disturbed area will ultimately reduce sediment loads to surface waters. Existing or newly planted vegetation that has been planted to stabilize disturbed areas should be protected by routing construction traffic around and protecting natural vegetation with fencing, tree armoring, retaining walls, or tree wells.

c. Clear only areas essential for construction.

Often areas of a construction site are unnecessarily cleared. Only those areas essential for completing construction activities should be cleared, and other areas should remain undisturbed. Additionally, the proposed limits of land disturbance should be physically marked off to ensure that only the required land area is cleared. Avoid disturbing vegetation on steep slopes or other critical areas.

d. Locate potential nonpoint pollutant sources away from steep slopes, waterbodies, and critical areas.

Material stockpiles, borrow areas, access roads, and other land-disturbing activities can often be located away from critical areas such as steep slopes, highly erodible soils, and areas that drain directly into sensitive waterbodies.

e. Route construction traffic to avoid existing or newly planted vegetation.

Where possible, construction traffic should travel over areas that must be disturbed for other construction activity. This practice will reduce the area that is cleared and susceptible to erosion.

f. Protect natural vegetation with fencing, tree armoring, and retaining walls or tree wells.

Tree armoring protects tree trunks from being damaged by construction equipment. Fencing can also protect tree trunks, but should be placed at the tree's drip line so that construction equipment is kept away from the tree. The tree drip line is the minimum area around a tree in which the tree's root system should not be disturbed by cut, fill, or soil compaction caused by heavy equipment. When cutting or filling must be done near a tree, a retaining wall or tree well should be used to minimize the cutting of the tree's roots or the quantity of fill placed over the tree's roots.

g. Stockpile topsoil and reapply to revegetate site.

Because of the high organic content of topsoil, it cannot be used as fill material or under pavement. After a site is cleared, the topsoil is typically removed. Since topsoil is essential to establish new vegetation, it should be stockpiled and then reapplied to the site for revegetation, if appropriate. Although topsoil salvaged from the existing site can often be used, it must meet certain standards and topsoil may need to be imported onto the site if the existing topsoil is not adequate for establishing new vegetation.

h. Cover or stabilize topsoil stockpiles.

Unprotected stockpiles are very prone to erosion and therefore stockpiles must be protected. Small stockpiles can be covered with a tarp to prevent erosion. Large stockpiles should be stabilized by erosion blankets, seeding, and/or mulching.

i. Use wind erosion controls.

Wind erosion controls limit the movement of dust from disturbed soil surfaces and include many different practices. Wind barriers block air currents and are effective in controlling soil blowing. Many different materials can be used as wind barriers, including solid board fence, snow fences, and bales of hay. Sprinkling moistens the soil surface with water and must be repeated as needed to be effective for preventing wind erosion (Delaware DNREC, 1989); however, applications must be monitored to prevent excessive runoff and erosion.

j. Intercept runoff above disturbed slopes and convey it to a permanent channel or storm drain.

Earth dikes, perimeter dikes or swales, or diversions can be used to intercept and convey runoff above disturbed areas. An earth dike is a temporary berm or ridge of compacted soil that channels water to a desired location. A perimeter dike/swale or diversion is a swale with a supporting ridge on the lower side that is constructed from the soil excavated from the adjoining swale (Delaware DNREC, 1989). These practices should be used to intercept flow from denuded areas or newly seeded areas to keep the disturbed areas from being eroded from the uphill runoff. The structures should be stabilized within 14 days of installation. A pipe slope drain, also known as a pipe drop structure, is a temporary pipe placed from the top of a slope to the bottom of the slope to convey concentrated runoff down the slope without causing erosion (Delaware DNREC, 1989).

k. On long or steep, disturbed, or man-made slopes, construct benches, terraces, or ditches at regular intervals to intercept runoff.

Benches, terraces, or ditches break up a slope by providing areas of low slope in the reverse direction. This keeps water from proceeding down the slope at increasing volume and velocity. Instead, the flow is directed to a suitable outlet, such as a sediment basin or trap. The frequency of benches, terraces, or ditches will depend on the erodibility of the soils, steepness and length of the slope, and rock outcrops. This practice should be used if there is a potential for erosion along the slope.

l. Use retaining walls.

Often retaining walls can be used to decrease the steepness of a slope. If the steepness of a slope is reduced, the runoff velocity is decreased and, therefore, the erosion potential is decreased.

m. Provide linings for urban runoff conveyance channels.

Often construction increases the velocity and volume of runoff, which causes erosion in newly constructed or existing urban runoff conveyance channels. If the runoff during or after construction will cause erosion in a channel, the channel should be lined or flow control BMPs installed. The first choice of lining should be grass or sod since this reduces runoff velocities and provides water quality benefits through filtration and infiltration. If the velocity in the channel would erode the grass or sod, then riprap, concrete, or gabions can be used.

n. Use check dams.

Check dams are small, temporary dams constructed across a swale or channel. They can be constructed using gravel or straw bales. They are used to reduce the velocity of concentrated flow and, therefore, to reduce the erosion in

a swale or channel. Check dams should be used when a swale or channel will be used for a short time and therefore it is not feasible or practical to line the channel or implement flow control BMPs (Delaware DNREC, 1989).

o. *Seed and fertilize.*

Seeding establishes a vegetative cover on disturbed areas. Seeding is very effective in controlling soil erosion once a dense vegetative cover has been established. However, often seeding and fertilizing do not produce as thick a vegetative cover as do seed and mulch or netting. Newly established vegetation does not have as extensive a root system as existing vegetation and therefore is more prone to erosion, especially on steep slopes. Care should be taken when fertilizing to avoid untimely or excessive application. Since the practice of seeding and fertilizing does not provide any protection during the time of vegetative establishment, it should be used only on favorable soils in very flat areas and not in sensitive areas.

p. *Use seeding and mulch/mats.*

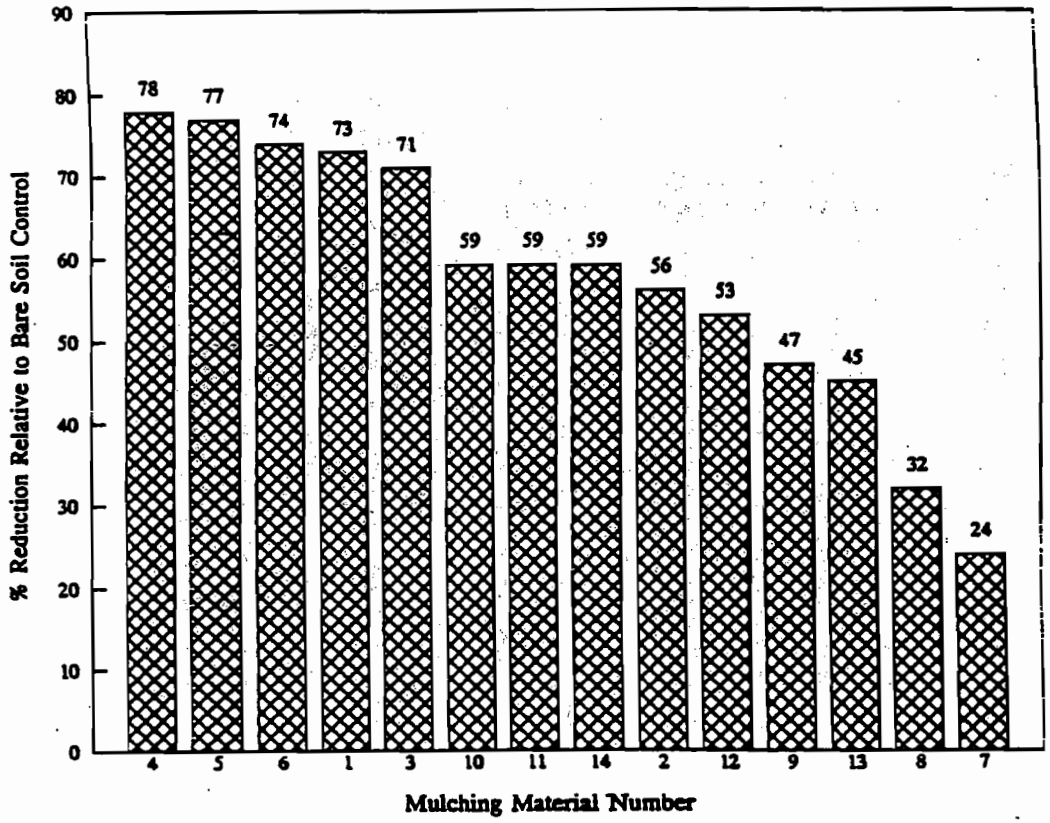
Seeding establishes a vegetative cover on disturbed areas. Seeding is very effective in controlling soil erosion once the vegetative cover has been established. The mulching/mats protect the disturbed area while the vegetation becomes established.

The management of land by using ground cover reduces erosion by reducing the flow rate of runoff and the raindrop impact. Bare soils should be seeded or otherwise stabilized within 15 calendar days after final grading. Denuded areas that are inactive and will be exposed to rain for 30 days or more should also be temporarily stabilized, usually by planting seeds and establishing vegetation during favorable seasons in areas where vegetation can be established. In very flat, non-sensitive areas with favorable soils, stabilization may involve simply seeding and fertilizing. Mulching and/or sodding may be necessary as slopes become moderate to steep, as soils become more erosive, and as areas become more sensitive.

q. *Use mulch/mats.*

Mulching involves applying plant residues or other suitable materials on disturbed soil surfaces. Mulchs/mats used include tacked straw, wood chips, and jute netting and are often covered by blankets or netting. Mulching alone should be used only for temporary protection of the soil surface or when permanent seeding is not feasible. The useful life of mulch varies with the material used and the amount of precipitation, but is approximately 2 to 6 months. Figure 4-5 shows water velocity reductions that could be expected using various mulching techniques. Similarly, Figure 4-6 shows reductions in soil loss achievable using various mulching techniques. During times of year when vegetation cannot be established, soil mulching should be applied to moderate slopes and soils that are not highly erodible. On steep slopes or highly erodible soils, multiple mulching treatments should be used. On a high-elevation or desert site where grasses cannot survive the harsh environment, native shrubs may be planted. Interlocking ceramic materials, filter fabric, and netting are available for this purpose. Before stabilizing an area, it is important to have installed all sediment controls and diverted runoff away from the area to be planted. Runoff may be diverted away from denuded areas or newly planted areas using dikes, swales, or pipe slope drains to intercept runoff and convey it to a permanent channel or storm drain. Reserved topsoil may be used to revegetate a site if the stockpile has been covered and stabilized.

Consideration should be given to maintenance when designing mulching and matting schemes. Plastic nets are often used to cover the mulch or mats; however, they can foul lawn mower blades if the area requires mowing.



Mulch Material	Characteristics
1	100% wheat straw/top net
2	100% wheat straw/two nets
3	70% wheat straw/30% coconut fiber
4	70% wheat straw/30% coconut fiber
5	100% coconut fiber
6	Nylon monofilament/two nets
7	Nylon monofilament/rigid/bonded
8	Vinyl monofilament/flexible/bonded
9	Curled wood fibers/top net
10	Curled wood fibers/two nets
11	Antiwash netting (jute)
12	Interwoven paper and thread
13	Uncrimped wheat straw – 2,242 kg/ha
14	Uncrimped wheat straw – 4,484 kg/ha

Figure 4-5. Water velocity reductions for different mulch treatments (adapted from Harding, 1990).

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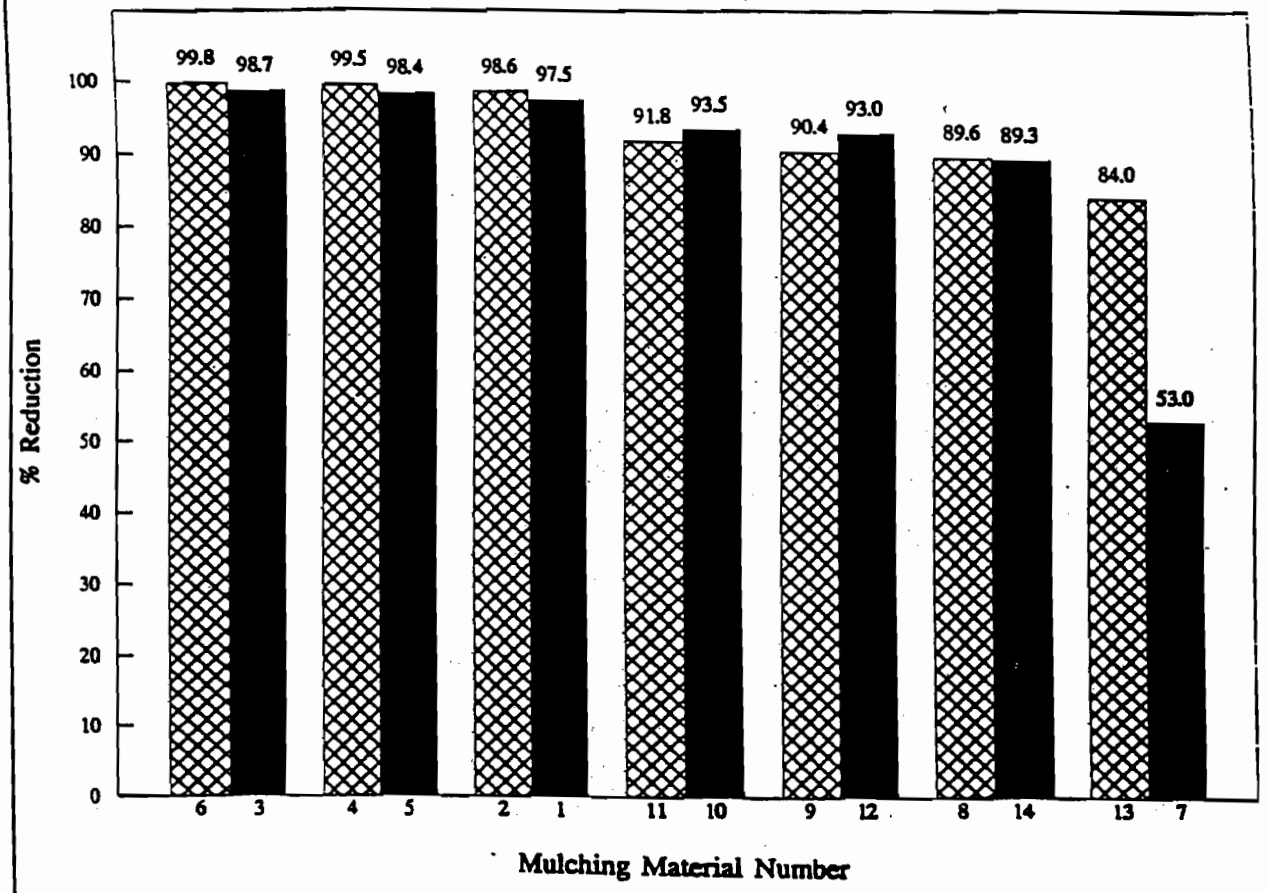

Mulch Material	Characteristics
1	100% wheat straw/top net
2	100% wheat straw/two nets
3	70% wheat straw/30% coconut fiber
4	70% wheat straw/30% coconut fiber
5	100% coconut fiber
6	Nylon monofilament/two nets
7	Nylon monofilament/rigid/bonded
8	Vinyl monofilament/flexible/bonded
9	Curled wood fibers/top net
10	Curled wood fibers/two nets
11	Antiwash netting (jute)
12	Interwoven paper and thread
13	Uncrimped wheat straw – 2,242 kg/ha
14	Uncrimped wheat straw – 4,484 kg/ha

Figure 4-6. Actual soil loss reductions for different mulch treatments (adapted from Harding, 1990).

r. Use sodding.

Sodding permanently stabilizes an area. Sodding provides immediate stabilization of an area and should be used in critical areas or where establishment of permanent vegetation by seeding and mulching would be difficult. Sodding is also a preferred option when there is a high erosion potential during the period of vegetative establishment from seeding.

s. Use wildflower cover.

Because of the hardy drought-resistant nature of wildflowers, they may be more beneficial as an erosion control practice than turf grass. While not as dense as turfgrass, wildflower thatches and associated grasses are expected to be as effective in erosion control and contaminant absorption. Because thatches of wildflowers do not need fertilizers, pesticides, or herbicides, and watering is minimal, implementation of this practice may result in a cost savings (Brash et al., undated). In 1987, Howard County, Maryland, spent $690.00 per acre to maintain turfgrass areas, compared to only $31.00 per acre for wildflower meadows (Wilson, 1990).

A wildflower stand requires several years to become established; maintenance requirements are minimal once the area is established (Brash et al., undated).

5. Sediment Control Practices[4]

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Sediment controls capture sediment that is transported in runoff. Filtration and detention (gravitational settling) are the main processes used to remove sediment from urban runoff.

a. Sediment Basins

Sediment basins, also known as silt basins, are engineered impoundment structures that allow sediment to settle out of the urban runoff. They are installed prior to full-scale grading and remain in place until the disturbed portions of the drainage area are fully stabilized. They are generally located at the low point of sites, away from construction traffic, where they will be able to trap sediment-laden runoff.

Sediment basins are typically used for drainage areas between 5 and 100 acres. They can be classified as either temporary or permanent structures, depending on the length of service of the structure. If they are designed to function for less than 36 months, they are classified as "temporary"; otherwise, they are considered permanent structures. Temporary sediment basins can also be converted into permanent urban runoff management ponds. When sediment basins are designed as permanent structures, they must meet all standards for wet ponds.

b. Sediment Trap

Sediment traps are small impoundments that allow sediment to settle out of runoff water. Sediment traps are typically installed in a drainageway or other point of discharge from a disturbed area. Temporary diversions can be

[4]Adapted from Goldman (1986).

used to direct runoff to the sediment trap. Sediment traps should not be used for drainage areas greater than 5 acres and typically have a useful life of approximately 18 to 24 months.

c. Filter Fabric Fence

Filter fabric fence is available from many manufacturers and in several mesh sizes. Sediment is filtered out as urban runoff flows through the fabric. Such fences should be used only where there is sheet flow (i.e., no concentrated flow), and the maximum drainage area to the fence should be 0.5 acre or less per 100 feet of fence. Filter fabric fences have a useful life of approximately 6 to 12 months.

d. Straw Bale Barrier

A straw bale barrier is a row of anchored straw bales that detain and filter urban runoff. Straw bales are less effective than filter fabric, which can usually be used in place of straw bales. However, straw bales have been effectively used as temporary check dams in channels. As with filter fabric fences, straw bale barriers should be used only where there is sheet flow. The maximum drainage area to the barrier should be 0.25 acre or less per 100 feet of barrier. The useful life of straw bales is approximately 3 months.

e. Inlet Protection

Inlet protection consists of a barrier placed around a storm drain drop inlet, which traps sediment before it enters the storm sewer system. Filter fabric, straw bales, gravel, or sand bags are often used for inlet protection.

f. Construction Entrance

A construction entrance is a pad of gravel over filter cloth located where traffic leaves a construction site. As vehicles drive over the gravel, mud, and sediment are collected from the vehicles' wheels and offsite transport of sediment is reduced.

g. Vegetated Filter Strips

Vegetated filter strips are low-gradient vegetated areas that filter overland sheet flow. Runoff must be evenly distributed across the filter strip. Channelized flows decrease the effectiveness of filter strips. Level spreading devices are often used to distribute the runoff evenly across the strip (Dillaha et al., 1989).

Vegetated filter strips should have relatively low slopes and adequate length and should be planted with erosion-resistant plant species. The main factors that influence the removal efficiency are the vegetation type, soil infiltration rate, and flow depth and travel time. These factors are dependent on the contributing drainage area, slope of strip, degree and type of vegetative cover, and strip length. Maintenance requirements for vegetated filter strips include sediment removal and inspections to ensure that dense, vigorous vegetation is established and concentrated flows do not occur. Maintenance of these structures is discussed in Section II.A of this chapter.

6. Effectiveness and Cost Information

a. Erosion Control Practices

The effectiveness of erosion control practices can vary based on land slope, the size of the disturbed area, rainfall frequency and intensity, wind conditions, soil type, use of heavy machinery, length of time soils are exposed and unprotected, and other factors. In general, a system of erosion and sediment control practices can more effectively reduce offsite sediment transport than can a single system. Numerous nonstructural measures such as protecting natural or newly planted vegetation, minimizing the disturbance of vegetation on steep slopes and other highly

erodible areas, maximizing the distance eroded material must travel before reaching the drainage system, and locating roads away from sensitive areas may be used to reduce erosion.

Table 4-15 contains the available cost and effectiveness data for some of the erosion controls listed above. Information on the effectiveness of individual nonstructural controls was not available. All reported effectiveness data assume that controls are properly designed, constructed, and maintained. Costs have been broken down into annual capital costs, annual maintenance costs, and total annual costs (including annualization of the capital costs).

b. Sediment Control Practices

Regular inspection and maintenance are needed for most erosion control practices to remain effective. The effectiveness of sediment controls will depend on the size of the construction site and the nature of the runoff flows. Sediment basins are most appropriate for drainage areas of 5 acres or greater. In smaller areas with concentrated flows, silt traps may suffice. Where concentrated flow leaves the site and the drainage area is less than 0.5 ac/100 ft of flow, filter fabric fences may be effective. In areas where sheet flow leaves the site and the drainage area is greater than 0.5 acre/100 ft of flow, perimeter dikes may be used to divert the flow to a sediment trap or sediment basin. Urban runoff inlets may be protected using straw bales or diversions to filter or route runoff away from the inlets.

Table 4-16 describes the general cost and effectiveness of some common sediment control practices.

c. Comparisons

Figure 4-7 illustrates the estimated TSS loading reductions from Maryland construction sites possible using a combination of erosion and sediment controls in contrast to using only sediment controls. Figure 4-8 shows a comparison of the cost and effectiveness of various erosion control practices. As can be seen in Figure 4-8, seeding or seeding and mulching provide the highest levels of control at the lowest cost.

Table 4-15. ESC Quantitative Effectiveness and Cost Summary

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Sod	Immediate erosion protection where there is high erosion potential during vegetative establishment.	Average: 99% Observed range: 98% - 99% References: Minnesota Pollution Control Agency, 1989; Pennsylvania, 1983 cited in USEPA, 1991	2	Average: $0.2 per ft^2 [$11,300 per acre] Range: $0.1 - $1.1 References: SWRPC, 1991; Schueler, 1987; Virginia, 1980	Average: 5% Range: 5% Reference: SWRPC, 1991	$0.20 per ft^2 $7,500 per acre
Seed	Establish vegetation on disturbed area.	After vegetation established- Average: 90% Observed range: 50% - 100% References: SCS, 1985 cited in EPA, 1991; Minnesota Pollution Control Agency, 1989; Oberts, 1984 cited in City of Austin, 1988; Delaware Department of Natural Resources, 1989	2	Average: $400 per acre Range: $200 - $1000 per acre References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986; Virginia, 1980	Average: 20% Range: 15% - 25% References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991	$300 per acre
Seed and Mulch	Establish vegetation on disturbed area.	After vegetation established- Average: 90% Observed range: 50% - 100% References: SCS, 1985 cited in EPA, 1991; Minnesota Pollution Control Agency, 1989; Oberts, 1984 cited in City of Austin, 1988; Delaware Department of Natural Resources, 1989	2	Average: $1,500 per acre Range: $800 - $3,500 per acre References: Goldman, 1986; Washington DOT, 1990; NC State, 1990; Schueler, 1987; Virginia, 1980; SWRPC, 1991	Average: NA[b] Range: NA References: None	$1,100 per acre

Table 4-15. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Mulch	Temporary stabilization of disturbed area.	Observed range: sand: 20% slope / 50% slope wood fiber @ 1500 lb/ac: 50-60% / 0-20% wood fiber @ 3000 lb/ac: 50-85% / 50-70% straw @ 3000 lb/ac: 90-100% / 95% Silt-loam: 20% slope / 50% slope wood fiber @ 1500 lb/ac: 20-60% / 40-60% wood fiber @ 3000 lb/ac: 60-90% / 60-70% straw @ 3000 lb/ac: 80-95% / 70-90% Silt-clay-loam: 10-30% slope / 30-50% slope wood fiber @ 1500 lb/ac: 5% / -- wood fiber @ 3000 lb/ac: 40% / -- jute netting: 30-60% / 30% straw @ 3000 lb/ac: 40-70% / 20-40% wood chips @ 10,000 lb/ac: 60-80% / 50-60% mulch blanket: 60-80% / 50-60% excelsior blanket: 60-80% / 50-60% multiple treatment (straw and jute): 90% / 90% References: Minnesota Pollution Control Agency, 1989; Kay, 1983 cited in Goldman, 1986	Straw mulch: 0.25 Wood fiber mulch: 0.33 Jute netting: 0.33 Straw and jute: 0.33	Straw mulch: Average: $1,700 per acre Range: $500 - $5,000 per acre References: Wisconsin DOT cited in SWRPC, 1991; Washington DOT, 1990; Virginia, 1980 Wood fiber mulch: Average: $1,000 per acre Range: $100 - $2,300 per acre References: Washington DOT, 1990; Virginia, 1980 Jute netting: Average: $3,700 per acre Range: $3,500-$4,100 per acre References: Washington DOT, 1990; Virginia, 1980 Straw and jute: Average: $5,400 per acre Range: $4,000-$9,100 per acre References: Washington DOT, 1990; Virginia, 1980	Average: NA[b] Range: NA References: None	Straw mulch: $7,500 per acre Wood fiber mulch: $3,500 per acre Jute netting: $12,500 per acre Straw and jute: $18,000 per acre

Table 4-15. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Terraces	Break up long or steep slopes.	Observed range: Land Slope / Reduction in Erosion 1-12% / 70% 12-18% / 60% 18-24% / 55% Additionally, if the slope steepness is halved, while other factors are held constant, the soil loss potential decreases 2-1/2 times. If both the slope and length are halved, the soil loss potential is decreased 4 times. References: Goldman, 1986; Beasley, 1972	2	Average: $5 per lin ft Range: $1 - $12 References: SWRPC, 1991; Goldman, 1986; Virginia, 1991	Average: 20% Range: 20% Reference: SWRPC, 1991	$4 per lin ft
All Erosion Controls	Reduce amount of sediment entering runoff.	Average: 85% Observed range: 85% Reference: Schueler, 1990	--	Varies but typically low	Varies but typically low	Varies but typically low

NA - Not available.
[a] Useful life estimated as length of construction project (assumed to be 2 years).
[b] For Total Annual Cost, assume Annual Maintenance Cost = 2% of construction cost.

Table 4-16. ESC Quantitative Effectiveness and Cost Summary for Sediment Control Practices

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Sediment basin	Minimum drainage area = 5 acres, maximum drainage area = 100 acres	Average: 70% Observed range: 55% - 100% References: Schueler, 1990; Engle, BW and Jarrett, AR, 1990; Baumann, 1990	2	Less than 50,000 ft^3 storage Average: \$0.60 per ft^3 storage (\$1,100 per drainage acre[c]) Range: \$0.20 - \$1.30 per ft^3	Average: 25% Range: 25% References: Denver COG cited in SWRPC, 1991; SWRPC, 1991	Less than 50,000 ft^3 storage \$0.40 per ft^3 storage \$700 per drainage acre[b]
				Greater than 50,000 ft^3 storage Average: \$0.3 per ft^3 storage (\$550 per drainage acre[c]) Range: \$0.10 - \$0.40 per ft^3 References: SWRPC, 1991		Greater than 50,000 ft^3 storage \$0.20 per ft^3 storage \$900 per drainage acre[c]
Sediment trap	Maximum drainage area = 5 acres	Average: 60% Observed range: (-7%) - 100% References: Schueler, et al., 1990; Tahoe Regional Planning Agency, 1989; Baumann, 1990	1.5	Average: \$0.60 per ft^3 storage (\$1,100 per drainage acre[c]) Range: \$0.20 - \$2.00 per ft^3 References: Denver COG cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986	Average: 20% Range: 20% References: Denver COG cited in SWRPC, 1991; SWRPC, 1991	\$0.70 per ft^3 storage \$1,300 per drainage acre[c]
Filter Fabric Fence	Maximum drainage area = 0.5 acre per 100 feet of fence. Not to be used in concentrated flow areas.	Average: 70% Observed range: 0% - 100% sand: 80% - 99% silt-loam: 50% - 80% silt-clay-loam: 0% - 20% References: Munson, 1991; Fisher et al., 1984; Minnesota Pollution Control Agency, 1989	0.5	Average: \$3 per lin ft (\$700 per drainage acre[c] Range: \$1 - \$8 per lin ft References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986; Virginia, 1991; NC State, 1990	Average: 100% Range: 100% References: SWRPC, 1991	\$7 per lin ft \$850 per drainage acre[c]

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Table 4-16. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Straw Bale Barrier	Maximum drainage area = 0.25 acre per 100 feet of barrier. Not to be used in concentrated flow areas.	Average: 70% Observed Range: 70% References: Virginia, 1980 cited in EPA, 1991	0.25	Average: $4 per lin ft ($1,600 per drainage acre[d] Range: $2 - $6 per lin ft References: Goldman, 1986; Virginia, 1991	Average: 100% Range: 100% References: SWRPC, 1991	$17 per lin ft $6,800 per drainage acre[d]
Inlet Protection	Protect storm drain inlet.	Average: NA Observed Range: NA References: None	1	Average: $100 per inlet Range: $50 - $150 References: SWRPC, 1991; Denver COG cited in SWRPC, 1991; Virginia, 1991; EPA cited in SWRPC, 1991	Average: 60% Range: 20% - 100% References: SWRPC, 1991; Denver COG cited in SWRPC, 1991	$150 per inlet
Construction Entrance	Removes sediment from vehicles wheels.	Average: NA Observed Range: NA References: None	2	Average: $2,000 each Range: $1,000 - $4,000 References: Goldman, 1986; NC State, 1990	Average: NA[e] Range: NA References: None	$1,500 each
				With washrack: Average: $3,000 each Range: $1,000 - $5,000 References: Virginia, 1991		$2,200 each

Table 4-16. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Vegetative Filter Strip	Must have sheet flow.	Average: 70% Observed Range: 20% - 80% References: Hayes and Hairston, 1983 cited in Casman, 1990; Dillaha et al., 1989, cited in Glick et al., 1991; Virginia Department of Conservation, 1987; Nonpoint Source Control Task Force, 1983 cited in Minnesota PCA, 1989; Schueler, 1987	2	Established from existing vegetation- Average: $0 Range: $0 References: Schueler, 1987 Established from sod- Average: $11,300 per acre Range: $4,500 - $48,000 per acre References: Schueler, 1987; SWRPC, 1991	Average: NA Range: NA References: None	NA

NA - Not available.
[a] Useful life estimated as length of construction project (assumed to be 2 years)
• For Total Annual Cost, assume Annual Maintenance Cost=20% of construction cost.
[b] Assumes trap volume = 1800 cf/ac (0.5 inches runoff per acre).
[c] Assumes drainage area of 0.5 acre per 100 feet of fence (maximum allowed).
[d] Assumes drainage area of 0.25 acre per 100 feet of barrier (maximum allowed).

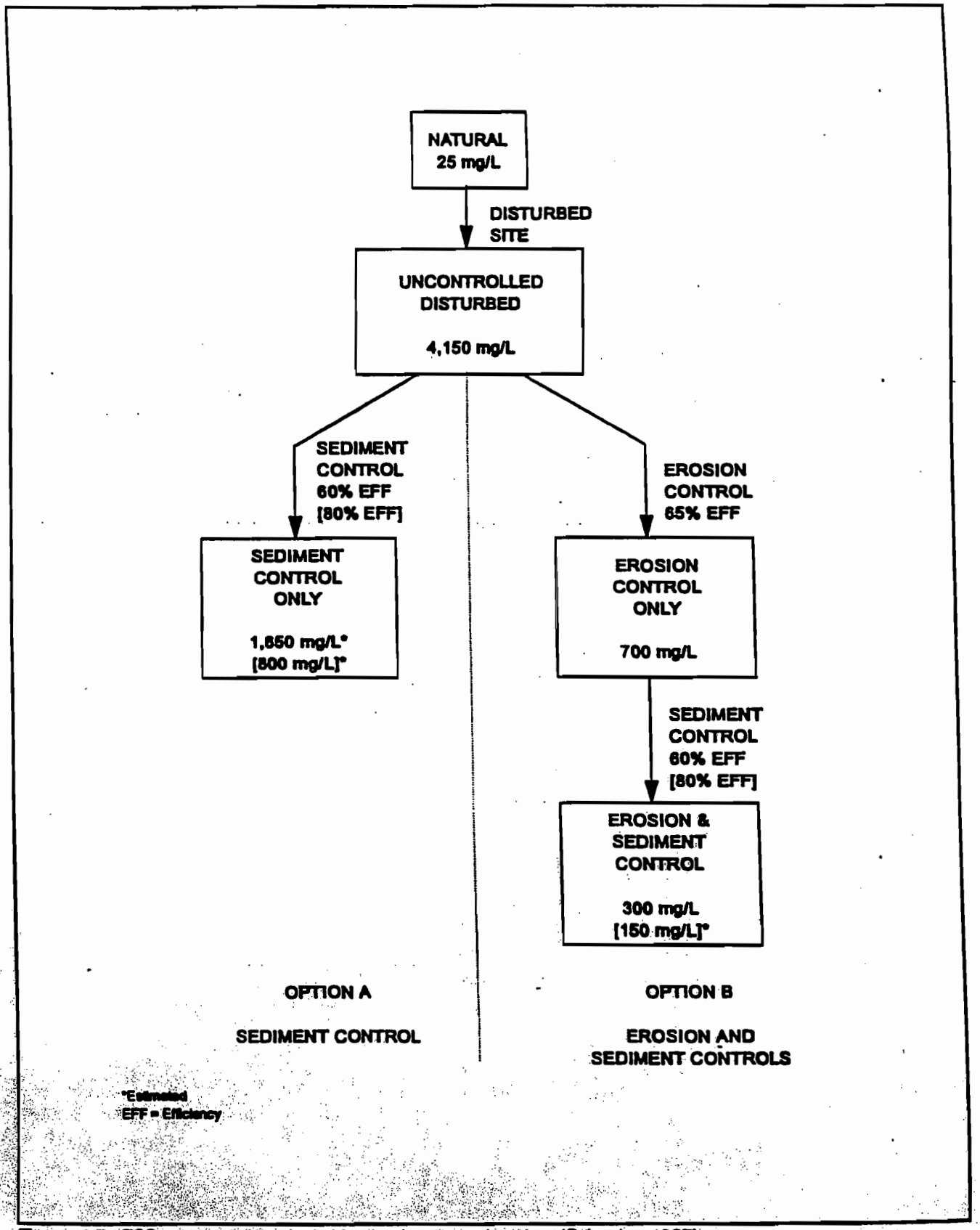

Figure 4-7. TSS concentrations from Maryland construction sites (Schueler, 1987).

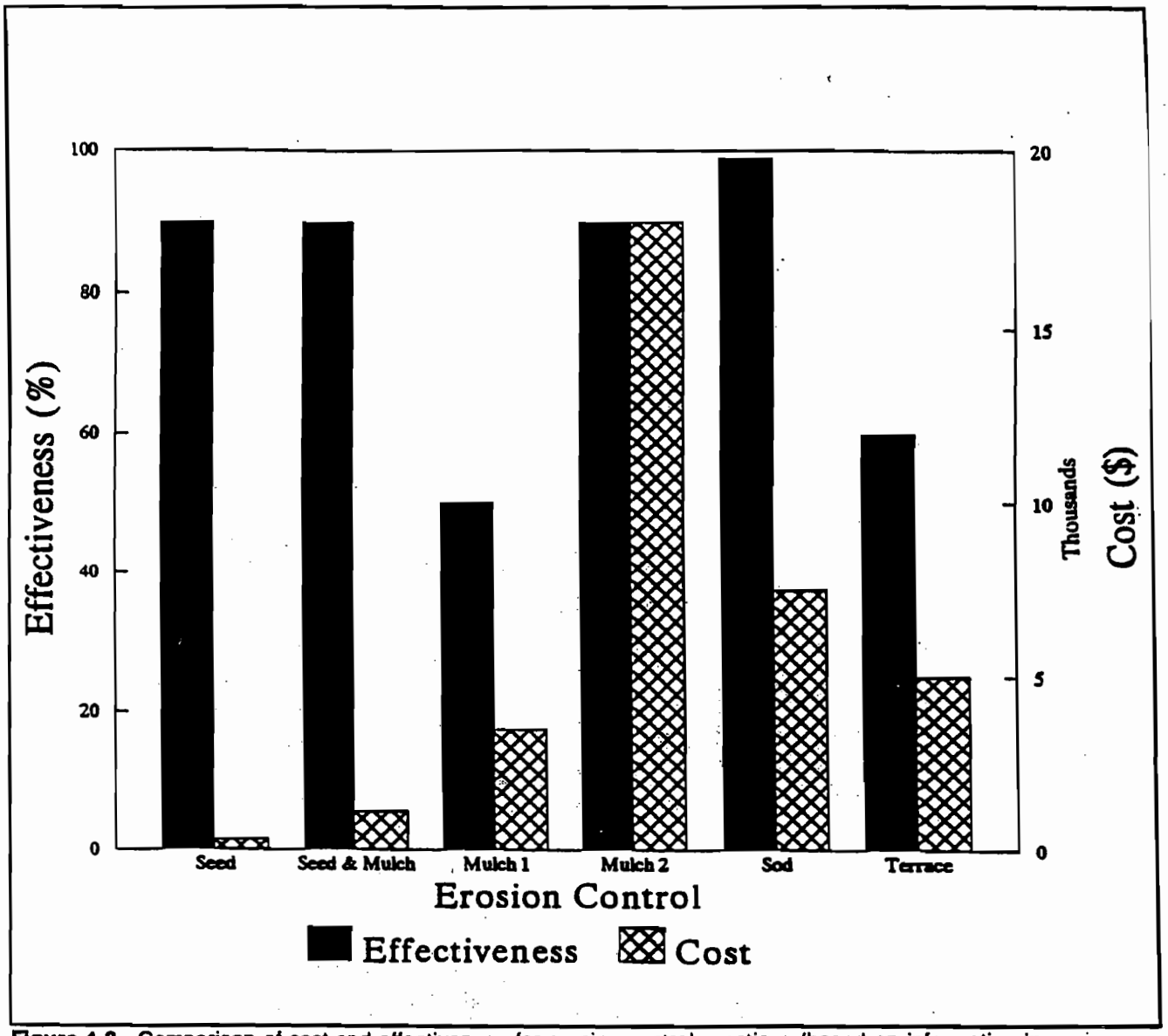

Figure 4-8. Comparison of cost and effectiveness for erosion control practices (based on information in Tables 4-15 and 4-16).

B. Construction Site Chemical Control Management Measure

(1) Limit application, generation, and migration of toxic substances;

(2) Ensure the proper storage and disposal of toxic materials; and

(3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

1. Applicability

This management measure is intended to be applied by States to all construction sites less than 5 acres in area and to new, resurfaced, restored, and reconstructed road, highway, and bridge construction projects. This management measure does not apply to: (1) construction of a detached single family home on a site of 1/2 acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. (NOTE: All construction activities, including clearing, grading, and excavation, that result in the disturbance of areas greater than or equal to 5 acres or are a part of a larger development plan are covered by the NPDES regulations and are thus excluded from these requirements.) Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformance with this management measure and will have flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The purpose of this management measure is to prevent the generation of nonpoint source pollution from construction sites due to improper handling and usage of nutrients and toxic substances, and to prevent the movement of toxic substances from the construction site.

Many potential pollutants other than sediment are associated with construction activities. These pollutants include pesticides (insecticides, fungicides, herbicides, and rodenticides); fertilizers used for vegetative stabilization; petrochemicals (oils, gasoline, and asphalt degreasers); construction chemicals such as concrete products, sealers, and paints; wash water associated with these products; paper; wood; garbage; and sanitary wastes (Washington State Department of Ecology, 1991).

The variety of pollutants present and the severity of their effects are dependent on a number of factors:

(1) **The nature of the construction activity.** For example, potential pollution associated with fertilizer usage may be greater along a highway or at a housing development than it would be at a shopping center development because highways and housing developments usually have greater landscaping requirements.

(2) **The physical characteristics of the construction site.** The majority of all pollutants generated at construction sites are carried to surface waters via runoff. Therefore, the factors affecting runoff volume,

such as the amount, intensity, and frequency of rainfall; soil infiltration rates; surface roughness; slope length and steepness; and area denuded, all contribute to pollutant loadings.

(3) **The proximity of surface waters to the nonpoint pollutant source.** As the distance separating pollutant-generating activities from surface waters decreases, the likelihood of water quality impacts increases.

a. Pesticides

Insecticides, rodenticides, and herbicides are used on construction sites to provide safe and healthy conditions, reduce maintenance and fire hazards, and curb weeds and woody plants. Rodenticides are also used to control rodents attracted to construction sites. Common insecticides employed include synthetic, relatively water-insoluble chlorinated hydrocarbons, organophosphates, carbamates, and pyrethrins.

b. Petroleum Products

Petroleum products used during construction include fuels and lubricants for vehicles, for power tools, and for general equipment maintenance. Specific petroleum pollutants include gasoline, diesel oil, kerosene, lubricating oils, and grease. Asphalt paving also can be particularly harmful since it releases various oils for a considerable time period after application. Asphalt overloads might be dumped and covered without inspection. However, many of these pollutants adhere to soil particles and other surfaces and can therefore be more easily controlled.

c. Nutrients

Fertilizers are used on construction sites when revegetating graded or disturbed areas. Fertilizers contain nitrogen and phosphorus, which in large doses can adversely affect surface waters, causing eutrophication.

d. Solid Wastes

Solid wastes on construction sites are generated from trees and shrubs removed during land clearing and structure installation. Other wastes include wood and paper from packaging and building materials, scrap metals, sanitary wastes, rubber, plastic and glass, and masonry and asphalt products. Food containers, cigarette packages, leftover food, and aluminum foil also contribute solid wastes to the construction site.

e. Construction Chemicals

Chemical pollutants, such as paints, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, soil additives used for stabilization, and concrete-curing compounds, may also be used on construction sites and carried in runoff.

f. Other Pollutants

Other pollutants, such as wash water from concrete mixers, acid and alkaline solutions from exposed soil or rock, and alkaline-forming natural elements, may also be present and contribute to nonpoint source pollution.

Revegetation of disturbed areas may require the use of fertilizers and pesticides, which, if not applied properly, may become nonpoint source pollutants. Many pesticides are restricted by Federal and/or State regulations.

Hydroseeding operations, in which seed, fertilizers, and lime are applied to the ground surface in a one-step operation, are more conducive to nutrient pollution than are the conventional seedbed-preparation operations, in which fertilizers and lime are tilled into the soil. Use of fertilizers containing little or no phosphorus may be required by

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local authorities if the development is near sensitive waterbodies. The addition of lime can also affect the pH of sensitive waters, making them more alkaline.

Improper fueling and servicing of vehicles can lead to significant quantities of petroleum products being dumped onto the ground. These pollutants can then be washed off site in urban runoff, even when proper erosion and sediment controls are in place. Pollutants carried in solution in runoff water, or fixed with sediment crystalline structures, may not be adequately controlled by erosion and sediment control practices (Washington Department of Ecology, 1991). Oils, waxes, and water-insoluble pesticides can form surface films on water and solid particles. Oil films can also concentrate water-soluble insecticides. These pollutants can be nearly impossible to control once present in runoff other than by the use of very costly water-treatment facilities (Washington Department of Ecology, 1991).

After spill prevention, one of the best methods to control petroleum pollutants is to retain sediments containing oil on the construction site through use of erosion and sediment control practices. Improved maintenance and safe storage facilities will reduce the chance of contaminating a construction site. One of the greatest concerns related to use of petroleum products is the method for waste disposal. The dumping of petroleum product wastes into sewers and other drainage channels is illegal and could result in fines or job shutdown.

The primary control method for solid wastes is to provide adequate disposal facilities. Erosion and sediment control structures usually capture much of the solid waste from construction sites. Periodic removal of litter from these structures will reduce solid waste accumulations. Collected solid waste should be removed and disposed of at authorized disposal areas.

Improperly stored construction materials, such as pressure-treated lumber or solvents, may lead to leaching of toxics to surface water and ground water. Disposal of construction chemicals should follow all applicable State and local laws that may require disposal by a licensed waste management firm.

3. Management Measure Selection

This management measure was selected based on the potential for many construction activities to contribute to nutrient and toxic NPS pollution.

This management measure was selected because (1) construction activities have the potential to contribute to increased loadings of toxic substances and nutrients to waterbodies; (2) various States and local governments regulate the control of chemicals on construction sites through spill prevention plans, erosion and sediment control plans, or other administrative devices; (3) the practices described are commonly used and presented in a number of best management practice handbooks and guidance manuals for construction sites; and (4) the practices selected are the most economical and effective.

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

a. *Properly store, handle, apply, and dispose of pesticides.*

Pesticide storage areas on construction sites should be protected from the elements. Warning signs should be placed in areas recently sprayed or treated. Persons mixing and applying these chemicals should wear suitable protective clothing, in accordance with the law.

Application rates should conform to registered label directions. Disposal of excess pesticides and pesticide-related wastes should conform to registered label directions for the disposal and storage of pesticides and pesticide containers set forth in applicable Federal, State, and local regulations that govern their usage, handling, storage, and disposal. Pesticides and herbicides should be used only in conjunction with Integrated Pest Management (IPM) (see Chapter 2). Pesticides should be the tool of last resort; methods that are the least disruptive to the environment and human health should be used first.

Pesticides should be disposed of through either a licensed waste management firm or a treatment, storage, and disposal (TSD) facility. Containers should be triple-rinsed before disposal, and rinse waters should be reused as product.

Other practices include setting aside a locked storage area, tightly closing lids, storing in a cool, dry place, checking containers periodically for leaks or deterioration, maintaining a list of products in storage, using plastic sheeting to line the storage area, and notifying neighboring property owners prior to spraying.

b. ***Properly store, handle, use, and dispose of petroleum products.***

When storing petroleum products, follow these guidelines:

- Create a shelter around the area with cover and wind protection;
- Line the storage area with a double layer of plastic sheeting or similar material;
- Create an impervious berm around the perimeter with a capacity 110 percent greater than that of the largest container;
- Clearly label all products;
- Keep tanks off the ground; and
- Keep lids securely fastened.

Oil and oily wastes such as crankcase oil, cans, rags, and paper dropped into oils and lubricants should be disposed of in proper receptacles or recycled. Waste oil for recycling should not be mixed with degreasers, solvents, antifreeze, or brake fluid.

c. ***Establish fuel and vehicle maintenance staging areas located away from all drainage courses, and design these areas to control runoff.***

Proper maintenance of equipment and installation of proper stream crossings will further reduce pollution of water by these sources. Stream crossings should be minimized through proper planning of access roads. Refer to Chapter 3 for additional information on stream crossings.

d. ***Provide sanitary facilities for constructions workers.***

e. ***Store, cover, and isolate construction materials, including topsoil and chemicals, to prevent runoff of pollutants and contamination of ground water.***

f. ***Develop and implement a spill prevention and control plan. Agencies, contractors, and other commercial entities that store, handle, or transport fuel, oil, or hazardous materials should develop a spill response plan.***

Post spill procedure information and have persons trained in spill handling on site or on call at all times. Materials for cleaning up spills should be kept on site and easily available. Spills should be cleaned up immediately and the contaminated material properly disposed of. Spill control plan components should include:

- Stop the source of the spill.
- Contain any liquid.
- Cover the spill with absorbent material such as kitty litter or sawdust, but do not use straw. Dispose of the used absorbent properly.

g. *Maintain and wash equipment and machinery in confined areas specifically designed to control runoff.*

Thinners or solvents should not be discharged into sanitary or storm sewer systems when cleaning machinery. Use alternative methods for cleaning larger equipment parts, such as high-pressure, high-temperature water washes, or steam cleaning. Equipment-washing detergents can be used, and wash water may be discharged into sanitary sewers if solids are removed from the solution first. (This practice should be verified with the local sewer authority.) Small parts can be cleaned with degreasing solvents, which can then be reused or recycled. Do not discharge any solvents into sewers.

Washout from concrete trucks should be disposed of into:

- A designated area that will later be backfilled;
- An area where the concrete wash can harden, can be broken up, and then can be placed in a dumpster; or
- A location not subject to urban runoff and more than 50 feet away from a storm drain, open ditch, or surface water.

Never dump washout into a sanitary sewer or storm drain, or onto soil or pavement that carries urban runoff.

h. *Develop and implement nutrient management plans.*

Properly time applications, and work fertilizers and liming materials into the soil to depths of 4 to 6 inches. Using soil tests to determine specific nutrient needs at the site can greatly decrease the amount of nutrients applied.

i. *Provide adequate disposal facilities for solid waste, including excess asphalt, produced during construction.*

j. *Educate construction workers about proper materials handling and spill response procedures. Distribute or post informational material regarding chemical control.*

ORDINANCE NO. 2108

BILL NO. 6 (1992)

Draft 1

A BILL FOR AN ORDINANCE AMENDING CHAPTER 16.20 OF THE MAUI COUNTY CODE, PERTAINING TO THE PLUMBING CODE

BE IT ORDAINED BY THE PEOPLE OF THE COUNTY OF MAUI:

SECTION 1. Title 16 of the Maui County Code is amended by adding a new section to Chapter 10 of the Uniform Plumbing Code to be designated and to read as follows:

"16.20.675 Section 1050 added. Chapter 10 of the Uniform Plumbing Code is amended by adding a new section, pertaining to low-flow water fixtures and devices, to be designated and to read as follows:

Sec. 1050 Low-flow water fixtures and devices. (a) This section establishes maximum rates of water flow or discharge for plumbing fixtures and devices in order to promote water conservation.

(b) For the plumbing fixtures and devices covered in this section, manufacturers or their local distributors shall provide proof of compliance with the performance requirements established by the American National Standards Institute (ANSI) and such other proof as may be required by the director of public works. There shall be no charge for this registration process.

(c) Effective December 31, 1992, only plumbing fixtures and devices specified in this section shall be offered for sale or installed in the County of Maui, unless otherwise indicated in this section. All plumbing fixtures and devices which were installed before December 31, 1992, shall be allowed to be used, repaired or replaced after December 31, 1992.

(1) Faucets (kitchen): All kitchen and bar sink faucets shall be designed, manufactured, installed or equipped with a flow control device or aerator which will prevent a water flow rate in excess of two and two-tenths gallons per minute at sixty pounds per square inch of water pressure.

(2) Faucets (lavatory): All lavatory faucets shall be designed, manufactured, installed or equipped with a flow control device or aerator which will prevent a water flow rate in excess of two and two tenths gallons per minute at sixty pounds per square inch of water

pressure.

(3) Faucets (public rest rooms): In addition to the lavatory requirements set forth in paragraph (2), lavatory faucets located in rest rooms intended for use by the general public shall be of the metering or self-closing types.

(4) Hose bibbs: Water supply faucets or valves shall be provided with approved flow control devices which limit flow to a maximum three gallons per minute.

EXCEPTIONS: (A) Hose bibbs or valves not used for fixtures or equipment designated by the director of public works.

(B) Hose bibbs, faucets, or valves serving fixed demand, timing, or water level control appliances, and equipment or holding structures such as water closets, pools, automatic washers, and other similar equipment.

(5) Showerheads: Showerheads, except where provided for safety or emergency reasons, shall be designed, manufactured, or installed with a flow limitation device which will prevent a water flow rate in excess of two and one-half gallons per minute at eighty pounds per square inch of water pressure. The flow limitation device must be a permanent and integral part of the showerhead and must not be removable to allow flow rates in excess of two and one-half gallons per minute or must be mechanically retained requiring force in excess of eight pounds to remove.

(6) Urinals: Urinals shall be designed, manufactured, or installed so that the maximum flush will not exceed one gallon of water. Adjustable type flushometer valves may be used provided they are adjusted so the maximum flush will not exceed one and six tenths gallons of water.

(7) Water closets (toilets): Water closets shall be designed, manufactured, or installed so that the maximum flush will not exceed one and six tenths gallons of water.

(d) Beginning December 31, 1992, it is unlawful to sell or install any plumbing fixtures or devices not specified in this section, except as permitted under this section.

(e) The director of public works may exempt the use of low-flow water fixtures and devices if there is a finding that the use of such fixtures and devices would not be consistent with accepted engineering practices and would be detrimental to the public health, safety and welfare.

(f) Any person violating this section shall be fined $250 for each violation and shall correct all instances of non-compliance for which a citation is issued. Violation of this section shall constitute a violation as defined in section 701-107 Hawaii Revised Statutes and shall be enforceable by employees of the department of public works. The foregoing fine may also be imposed in a civil, administrative proceeding pursuant to Rules and Regulations adopted by the department of public works in accordance with chapter 91 Hawaii Revised Statutes."

SECTION 2. New material is underscored. In printing this bill, the County Clerk need not include the underscoring.

SECTION 3. This ordinance shall take effect upon its approval.

APPROVED AS TO FORM
AND LEGALITY:

HOWARD M. FUKUSHIMA
Deputy Corporation Counsel
County of Maui
c:\wp51\ords\flows4\pk

WE HEREBY CERTIFY that the foregoing BILL NO. 6 (1992), Draft 1

1. Passed FINAL READING at the meeting of the Council of the County of Maui, State of Hawaii, held on the 1st day of May, 1992, by the following votes:

Howard S. KIHUNE Chair	Patrick S. KAWANO Vice-Chair	Vince G. BAGOYO, Jr.	Goro HOKAMA	Alice L. LEE	Ricardo MEDINA	Wayne K. NISHIKI	Joe S. TANAKA	Lainaala TERUYA DRUMMOND
Aye	Aye	Excused	Excused	Aye	Aye	Aye	Aye	Aye

2. Was transmitted to the Mayor of the County of Maui, State of Hawaii, on the 1st day of May, 1992.

DATED AT WAILUKU, MAUI, HAWAII, this 1st day of May, 1992.

HOWARD S. KIHUNE, CHAIR
Council of the County of Maui

DARYL T. YAMAMOTO, COUNTY CLERK
County of Maui

THE FOREGOING BILL IS HEREBY APPROVED THIS 5th DAY OF MAY, 1992.

LINDA CROCKETT LINGLE, MAYOR
County of Maui

I HEREBY CERTIFY that upon approval of the foregoing BILL by the Mayor of the County of Maui, the said BILL was designated as ORDINANCE NO. 2108 of the County of Maui, State of Hawaii.

DARYL T. YAMAMOTO, COUNTY CLERK
County of Maui

Passed First Reading on January 17, 1992.
Effective date of Ordinance May 5, 1992.

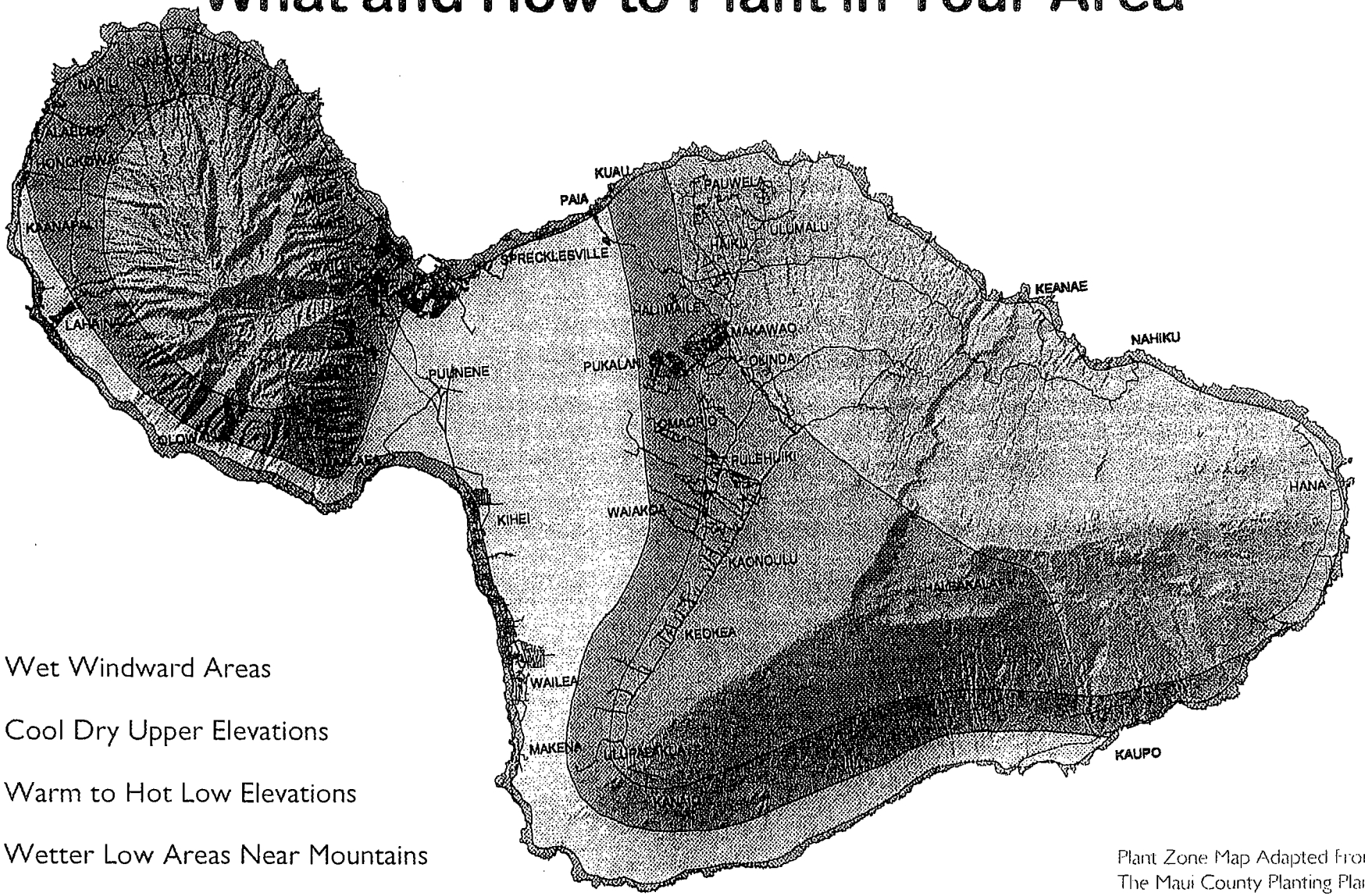
I HEREBY CERTIFY that the foregoing is a true and correct copy of Ordinance No. 2108, the original of which is on file in the Office of the County Clerk, County of Maui, State of Hawaii.

Dated at Wailuku, Hawaii, on

County Clerk, County of Maui

Saving Water in The Yard

What and How to Plant in Your Area



1 Wet Windward Areas

2 Cool Dry Upper Elevations

3 Warm to Hot Low Elevations

4 Wetter Low Areas Near Mountains

5 Windward Coastal Salt Spray Zones

Plant Zone Map Adapted From
The Maui County Planting Plan

Tips From The Maui County Department of Water Supply

By Water All Things Find Life

Zone-specific Native and Polynesian plants for Maui County

Zone 1

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia arecina	lo'ulu, hawane	40'	10'	1,000' to 3,000'	Dry to Wet
P	Pritchardia forbesiana	lo'ulu	15'			
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Cordyline fruticosa	ti, ki	6			
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Charpentiera obovata		15'			
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 2

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia mauiensis var. diffusa	Maui wormwood, 'ahinahina	2'	3'	1,000' to higher	Dry to Medium
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Styphelia tamelameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Charpentiera obovata		15'			
Tr	Erythrina sandwicensis	wiliwili	20'	20'	sea to 1,000'	Dry
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 2

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Sophora chrysophylla	mamane	15'	15'	1,000' to 3,000'	Medium
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Boerhavia repens	alena	0.5'	4'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Cressa truxillensis	cressa	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Heliotropium anomalum var. argenteum	hinahina ku kahakai	1'	2'	sea to 1,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr	Sesuvium portulacastrum	'akulikuli, sea-purslane	0.5'	2'	sea to 1,000'	Dry to Wet
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
Gr - Sh	Lycium sandwicense	'ohelo-kai, 'ae'ae	2'	2'	sea to 1,000'	Dry to Medium
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Bidens mauiensis	ko'oko'olau	1'	3'	sea to 1,000'	Dry to Medium
Sh	Bidens menziesii ssp. menziesii	ko'oko'olau	1'	3'		
Sh	Bidens micrantha ssp. micrantha	ko'oko'olau	1'	3'		
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Gossypium tomentosum	mao, Hawaiian cotton	5'	8'	sea to 1,000'	Dry to Medium
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Styphelia tameiameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Canthium odoratum	Alahe'e, 'ohe'e, walahe'e	12'	8'	sea to 3,000'	Dry to Medium
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Diospyros sandwicensis	lama	12'	15'	sea to 3,000'	Dry to Medium
Tr	Erythrina sandwicensis	wiliwili	20'	20'	sea to 1,000'	Dry
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Nesoluma polynesicum	keahi	15'	15'	sea to 3,00'	Dry
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Reynoldsia sandwicensis	'ohe makai	20'	20'	1,000' to 3,000'	Dry
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Boerhavia repens	alena	0.5'	4'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Cressa truxillensis	cressa	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Heliotropium anomalum var. argenteum	hinahina ku kahakai	1'	2'	sea to 1,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr	Sesuvium portulacastrum	'akulikuli, sea-purslane	0.5'	2'	sea to 1,000'	Dry to Wet
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
Gr - Sh	Lycium sandwicense	'ohelo-kai, 'ae'ae	2'	2'	sea to 1,000'	Dry to Medium
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Bidens mauiensis	ko'oko'olau	1'	3'	sea to 1,000'	Dry to Medium
Sh	Bidens menziesii ssp. menziesii	ko'oko'olau	1'	3'		
Sh	Bidens micrantha ssp. micrantha	ko'oko'olau	1'	3'		
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Gossypium tomentosum	mao, Hawaiian cotton	5'	8'	sea to 1,000'	Dry to Medium
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Styphelia tameiameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Canthium odoratum	Alahe'e, 'ohe'e, walahe'e	12'	8'	sea to 3,000'	Dry to Medium
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Diospyros sandwicensis	lama	12'	15'	sea to 3,000'	Dry to Medium
Tr	Erythrina sandwicensis	wiliwili	20'	20'	sea to 1,000'	Dry
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Nesoluma polynesicum	keahi	15'	15'	sea to 3,00'	Dry
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Reynoldsia sandwicensis	'ohe makai	20'	20'	1,000' to 3,000'	Dry
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 4

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia arecina	lo'ulu, hawane	40'	10'	1,000' to 3,000'	Dry to Wet
P	Pritchardia forbesiana	lo'ulu	15'			
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia australis	'ahinahina	2'	3'	sea to 3,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 4

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Artemisia mauiensis var. diffusa	Maui wormwood, 'ahinahina	2'	3'	1,000' to higher	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Bidens menziesii ssp. menziesii	ko'oko'olau	1'	3'		
Sh	Bidens micrantha ssp. micrantha	ko'oko'olau	1'	3'		
Sh	Cordyline fruticosa	ti, ki	6			
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Styphelia tameiameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Canthium odoratum	Alahe'e, 'ohe'e, walahe'e	12'	8'	sea to 3,000'	Dry to Medium
Tr	Charpentiera obovata		15'			
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Diospyros sandwicensis	lama	12'	15'	sea to 3,000'	Dry to Medium
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 4

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Sophora chrysophylla	mamane	15'	15'	1,000' to 3,000'	Medium
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 5

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Boerhavia repens	alena	0.5'	4'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Cressa truxillensis	cressa	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Heliotropium anomalum var. argenteum	hinahina ku kahakai	1'	2'	sea to 1,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Sesuvium portulacastrum	'akulikuli, sea-purslane	0.5'	2'	sea to 1,000'	Dry to Wet
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lycium sandwicense	'ohelo-kai, 'ae'ae	2'	2'	sea to 1,000'	Dry to Medium
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia australis	'ahinahina	2'	3'	sea to 3,000'	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Bidens mauiensis	ko'oko'olau	1'	3'	sea to 1,000'	Dry to Medium
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Gossypium tomentosum	mao, Hawaiian cotton	5'	8'	sea to 1,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 5

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet
V	Ipomoea pes-caprae	beach morning glory, pohuehue	1			

DO NOT PLANT THESE PLANTS !!!

Common name	Scientific name	Plant family
black wattle	Acacia mearnsii	Mimosaceae
blackberry	Rubus argutus	Rosaceae
blue gum	Eucalyptus globulus	Myrtaceae
bocconia	Bocconia frutescens	Papaveraceae
broad-leaved cordia	Cordia glabra	Boraginaceae
broomsedge, yellow bluestem	Andropogon virginicus	Poaceae
buffelgrass	Cenchrus ciliaris	Poaceae
butterfly bush, smoke bush	Buddleja madagascariensis	Buddlejaceae
cats claw, Mysore thorn, wait-a-bit	Caesalpinia decapetala	Caesalpiniaceae
common ironwood	Casuarina equisetifolia	Casuarinaceae
common velvet grass, Yorkshire fog	Holcus lanatus	Poaceae
fiddlewood	Citharexylum spinosum	Verbenaceae
fire tree, faya tree	Myrica faya	Myricaceae
glorybower	Clerodendrum laponicum	Verbenaceae
hairy cat's ear, gosmore	Hypochoeris radicata	Asteraceae
haole koa	Leucaena leucocephala	Fabaceae
ivy gourd, scarlet-fruited gourd	Coccinia grandis	Cucurbitaceae
juniper berry	Citharexylum caudatum	Verbenaceae
kahili flower	Grevillea banksii	Proteaceae
klu, popinac	Acacia farnesiana	Mimosaceae
logwood, bloodwood tree	Haematoxylon campechianum	Caesalpiniaceae
loquat	Eriobotrya japonica	Rosaceae
meadow ricegrass	Ehrharta stipoides	Poaceae
melaleuca	Melaleuca quinquenervia	Myrtaceae
miconia, velvet leaf	Miconia calvescens	Melastomataceae
narrow-leaved carpetgrass	Axonopus fissifolius	Poaceae
oleaster	Elaeagnus umbellata	Elaeagnaceae
oriental mangrove	Bruguiera gymnorrhiza	Rhizophoraceae
padang cassia	Cinnamomum burmanii	Lauraceae
palmgrass	Setaria palmifolia	Poaceae
pearl flower	Heterocentron subtriplinervium	Melastomataceae
quinine tree	Cinchona pubesens	Rubiaceae
satin leaf, caimitillo	Chrysophyllum oliviforme	Sapotaceae
silkwood, Queensland maple	Flindersia brayleyana	Rutaceae
silky oak, silver oak	Grevillea robusta	Proteaceae
strawberry guava	Psidium cattleianum	Myrtaceae
swamp oak, saltmarsh, longleaf ironwood	Casuarina glauca	Casuarinaceae
sweet vernalgrass	Anthoxanthum odoratum	Poaceae
tree of heaven	Ailanthus altissima	Simaroubaceae
trumpet tree, guarumo	Cecropia obtusifolia	Cecropiaceae
white ginger	Hedychium coronarium	Zingiberaceae
white moho	Heliocarpus popayanensis	Tiliaceae
yellow ginger	Hedychium flavescens	Zingiberaceae

DO NOT PLANT THESE PLANTS !!!

Common name	Scientific name	Plant family
	Jasminum fluminense	Oleaceae
	Arthrostema ciliatum	Melastomataceae
	Dissotis rotundifolia	Melastomataceae
	Erigeron karvinskianus	Asteraceae
	Eucalyptus robusta	Myrtaceae
	Hedychium gardnerianum	Zingiberaceae
	Juncus planifolius	Juncaceae
	Lophostemon confertus	Myrtaceae
	Medinilla cumingii	Melastomataceae
	Medinilla magnifica	Melastomataceae
	Medinilla venosa	Melastomataceae
	Melastoma candidum	Melastomataceae
	Melinis minutiflora	Poaceae
	Olea europaea	
	Oxyspora paniculata	Melastomataceae
	Panicum maximum	Poaceae
	Paspalum urvillei	Poaceae
	Passiflora edulis	Passifloraceae
	Phormium tenax	Agavaceae
	Pinus taeda	Pinaceae
	Prosopis pallida	Fabaceae
	Pterolepis glomerata	Melastomataceae
	Rhodomyrtus tomentosa	Myrtaceae
	Schefflera actinophylla	Araliaceae
	Syzygium jambos	Myrtaceae
Australian blackwood	Acacia melanoxylon	Mimosaceae
Australian tree fern	Cyathea cooperi	Cyatheaceae
Australian tree fern	Sphaeropteris cooperi	Cyatheaceae
Beggar's tick, Spanish needle	Bidens pilosa	Asteraceae
California grass	Brachiaria mutica	Poaceae
Chinese banyon, Maylayan banyon	Ficus mirocarpa	Moraceae
Chinese violet	Asystasia gangetica	Acanthaceae
Christmasberry, Brazilian pepper	Schinus terebinthifolius	Anacardiaceae
Formosan koa	Acacia confusa	Mimosaceae
German ivy	Senecio mikanioides	Asteraceae
Japanese honeysuckle	Lonicera japonica	Caprifoliaceae
Koster's curse	Clidemia hirta	Melastomataceae
Lantana	Lantana camara	Verbenaceae
Mauritius hemp	Furcraea foetida	Agavaceae
Mexican ash, tropical ash	Fraxinus uhdei	Oleaceae
Mexican tulip poppy	Hunnemannia fumariifolia	Papaveraceae
Mules foot, Madagascar tree fern	Angiopteris evecta	Marattiaceae
New Zealand laurel, karakaranut	Corynocarpus laevigatus	Corynocarpaceae
New Zealand tea	Leptospermum scoparium	Myrtaceae
Pampas grass	Cortaderia jubata	Poaceae
Panama rubber tree, Mexican rubber tree	Castilloa elastica	Moraceae
Shoebutton ardisia	Ardisia elliptica	Myrsinaceae
banana poka	Passiflora mollissima	Passifloraceae

Selection

As a general rule, it is best to select the largest and healthiest specimens. However, be sure to note that they are not pot-bound. Smaller, younger plants may result in a low rate of plant survival.[1] When selecting native species, consider the site they are to be planted in, and the space that you have to plant. For example: Mountain species such as koa and maile will not grow well in hot coastal areas exposed to strong ocean breezes. Lowland and coastal species such as wiliwili and Kou require abundant sunshine and porus soil. They will not grow well with frequent cloud cover, high rainfall and heavy soil.

Consider too, the size that the species will grow to be. It is not wise to plant trees that will grow too large.[2] Overplanting tends to be a big problem in the landscape due to the underestimation of a species' height, width or spread.

A large, dense canopied tree such as the kukui is a good shade tree for a lawn. However, it's canopy size and density of shade will limit what can be planted in the surrounding area. Shade cast by a koa and ohia lehua is relatively light and will not inhibit growth beneath it.

Keep seasons in mind when you are selecting your plants. Not all plants look good year round, some plants such as ilima will look scraggly after they have flowered and formed seeds. Avoid planting large areas with only one native plant. Mixing plants which naturally grow together will ensure the garden will look good all year round.[3] Looking at natural habitats helps to show how plants grow naturally in the landscape.

When planting an area with a mixed-ecosystem, keep in mind the size and ecological requirements of each plant. Start with the hardiest and most easily grown species, but allow space for fragile ones in subsequent plantings.

Acquiring natives

Plants in their wild habitat must be protected and maintained. It is best and easiest to get your plants from nurseries (see list), or friend's gardens. Obtain proper permits from landowners and make sure you follow a few common sense rules:

- collect sparingly from each plant or area.
- some plants are on the state or Federal Endangered Species list. Make sure you get permits (see app. A,B)

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[1] K. Nagata, P.6

[2] K. Nagata, P.9

[3] Nagata, P.9

Soil

Once you have selected your site and the plants you wish to establish there, you must look at the soil conditions on the site. Proper soil is necessary for the successful growth of most native plants, which preform poorly in hard pan, clay or adobe soils. If natives are to be planted in these types of soil, it would be wise to dig planting holes several times the size of the rootball and backfill with 50-75% compost.[4] A large planting hole ensures the development of a strong root system. The plant will have a headstart before the roots penetrate the surrounding poor soil.[5]

It is recommended that native plants not be planted in ground that is more dense than potting soil. If there is no alternative, dig a hole in a mound of soil mixed with volcanic cinder which encourages maximum root development. Fill the hole with water, if the water tends to puddle or drain too slowly, dig a deeper hole until the water does not puddle longer than 1 or 2 minutes.[6] Well-drained soil is one of the most important things when planting natives as you will see in the next section.

Irrigation

Most natives do very poorly in waterlogged conditions. Do not water if the soil is damp. Water when the soil is dry and the plants are wilting. Once established, a good soaking twice a week should suffice. Deep soaking encourages the development of stronger, and deeper root systems. This is better than frequent and shallow watering which encourage weaker, more shallow root systems.

The following is a watering schedule from Kenneth Nagata's Booklet, *How To Plant A Native Hawaiian Garden*:

WATER REQUIREMENT	WATERING FREQUENCY
Heavy	3x / week
Moderate	2x / week
Light	1x / week

Red clay soils hold more water for a longer period of time than sandy soils do. If your area is very sunny or near a beach, things will dry out faster. Even in the area of one garden, there are parts that will need more or less water. Soils can vary and amount of shade and wind differ. After plants are established (a month or two for most plants, up to a year for some trees), you can back off watering.

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[4] Nagata, p. 6

[5] Nagata, p. 8

[6] Nagata, p. 8

Automatic sprinkler systems are expensive to install and must be checked and adjusted regularly. Above-ground systems allow you to monitor how much water is being put out, but you lose a lot due to malfunctioning of sprinkler heads and wind. The most efficient way to save water and make sure your plants get enough water, is to hand-water. This way you are getting our precious water to the right places in the right amounts.[7]

Fertilizer

An all-purpose fertilizer 10-10-10 is adequate for most species. They should be applied at planting time, 3 months later, and 6 months thereafter. Use half the dosage recommended for ornamentals and pay special attention to native ferns which are sensitive to strong fertilizers. Use of organic composts and aged animal manures is suggested instead of chemical fertilizers. In addition, use of cinders for providing trace minerals is strongly recommended.[8]

Natives are plants which were here hundreds of years before the polynesians inhabited the Hawaiian Islands. They were brought here by birds, or survived the harsh ocean conditions to float here. They are well-adapted to Hawaii's varying soil and environmental conditions. This is why they make prime specimens for a xeriscape garden. However, natives will not thrive on their own, especially under harsh conditions. On the other hand, like any other plant, if you over-water and over-fertilize them, they will die. Follow the instructions given to you by the nursery you buy the plant from, or from this booklet. Better yet, buy a book (suggested readings can be found in the bibliography in the back of this pamphlet), read it, and learn more about native plants. I guarantee that you will be pleased with the results.

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[7] Bornhorst, p. 19-20

[8] Nagata, p. 6

Propagation

There are many ways to propagate and plant-out native Hawaiian species. One of the most thourough and helpful book is Heidi Bornhorst's book, *Growing Native Hawaiian Plants.* The easiest, and best way to obtain natives for the novice gardener is to get them from a reputable nursery (see appendix c). That way all you will have to do is know how to transplant (if necessary) and plant-out when you are ready. These are the two methods I have listed here.

Transplanting

1. Use pots that are one size bigger than the potted plant is in
2. Get your potting medium ready

Good potting medium is a ½, ½ mixture of peat moss and perlite. If the plant is from a dry or coastal area, add chunks of cinder or extra perlite. If it is a wet forest species, add more peat moss or compost. Be aware that peat moss is very acidic and certain plants react severely to acidity.

If the plant is to eventually be planted into the ground, make a mix of equal parts peat moss, perlite, and soil from the area in which the plant is to be planted. Slow-release fertilizer can be mixed into the potting medium.

3. Once pots, potting medium, fertilizer and water are ready, you can begin re-potting. Keep the plant stem at the same depth it was in the original pot. Avoid putting the plant in too large a pot, as the plant may not be able to soak up all the water in the soil and the roots may drown and rot.

Mix potting medium and add slow-release fertilizer at this time. Pre-wet the medium to keep dust down and lessen shock to the plant. Put medium in bottom of pot. Measure for the correct depth in the new pot. Make sure there is from ½ to 2 inches from the top of the pot so the plant can get adequate water. Try to stand the plant upright and center the stem in the middle of the pot.

Water the plant thoroughly after transplanting. A vitamin B-1 transplanting solution can help to lessen the transplant shock. Keep the plant in the same type of environment as it was before, sun or shade. If roots were broken, trimm off some of the leaves to compensate for the loss.[9]

Planting out

1. Plant most native Hawaiian plants in a sunny location in soil that is well-drained.
2. Make the planting hole twice as wide as the root ball or present pot, and just as deep.

If the soil is clay-like, and drains slowly, mix in some coarse red or bland cinder, coarse perlite or

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[9] Bornhorst, p.20-21

coarse compost. Place some slow-release fertilizer at the bottom of the hole.

3. Carefully remove the plant from the container and place it in the hole.

The top of the soil should be at the same level as the top of the hole, if it is too high or too low, adjust the soil level so that the plant is at the right depth.

4. Water thoroughly after you transplant.

Mulch

Most natives cannot compete with weeds, and therefore must be weeded around constantly in order to thrive. Mulch is a practical alternative, which discourages and prevents weeds from growing.

Hawaii's hot, humid climate leads to the breaking down of organic mulches. Thick organic mulches such as wood chips and leaves, may also be hiding places for pests.

Stone mulches are attractive, permanent and can help to improve soil quality. Red or black cinder, blue rock chips, smooth river rocks and coral chips are some natural choices.[10] Macadamia nut hulls are also easy to find and can make a nice mulch.[11]

Never pile up mulch right next to the stem or trunk of a plant, keep it a few inches away.

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[10] Bornhorst, p. 24

[11] Nagata, p. 7

ZONES

The Maui County Planting Plan has compiled a system of 5 zones of plant growth for Maui County. The descriptions of zones and maps for these zones are as follows:

Zone 1:

Wet areas on the windward side of the island. More than 40 inches of rain per year. Higher than 3,000 feet.

Zone 2:

Cool, dry areas in higher elevations (above 1,000 feet). 20 to 40 inches of rain per year.

Zone 3:

Low, drier areas, warm to hot. Less than 20 inches of rain per year. Sea level to 1,000 feet.

Zone 4:

Lower elevations which are wetter due to proximity of mountains. 1,000 to 3,000 feet.

Zone 5:

Salt spray zones in coastal areas on the windward side.

These zones are to be used as a general guide to planting for Maui County. In addition to looking at the maps, read the descriptions of the zones and decide which zone best fits your area. Plants can be listed in more than one zone and can be planted in a variety of conditions. For best results, take notes on the rainfall, wind, sun and salt conditions of your site. Use the zones as a general guide for selection and read about the plants to decide which best fits your needs as far as care and or function.

PLACES TO SEE NATIVES ON MAUI:

The following places propagate native Hawaiian plants from seeds and/or cuttings. Their purpose is to protect and preserve these native plants. Please contact them before going to view the sites, they can provide valuable information and referral to other sources.

1.	Hoolawa Farms P O Box 731 Haiku HI 96708	575-5099
2.	The Hawaiian Collection 1127 Manu Street Kula HI 96790	878-1701
3.	Kula Botanical Gardens RR4, Box 228 Kula HI 96790	878-1715
4.	Maui Botanical Gardens Kanaloa Avenue, Kahului across from stadium	249-2798
5.	Kula Forest Reserve access road at the end of Waipoli Rd Call the Maui District Office	984-8100
6.	Wailea Point, Private Condominium residence 4000 Wailea Alanui, Kihei public access points at Four Seasons Resort or Polo Beach	875-9557
7.	Kahanu Gardens, National Tropical Botanical Garden Alau Place, Hana HI 96713	248-8912
8.	Kahului Library Courtyard 20 School Street Kahului HI 96732	873-3097

PLACES TO BUY NATIVE PLANTS ON MAUI

1. Ho'olawa Farms
   Anna Palomino
   P O Box 731
   Haiku HI 96708
   575-5099

   * The largest and best collection of natives in the state. They will deliver, but worth the drive to go and see! Will propagate upon request

2. Kahanu Gardens
   National Tropical Botanical Garden
   Alau Place, Hana
   248-8912

3. Kihana Nursery
   1708 South Kihei Road
   Kihei HI 96753
   879-1165

4. Kihei Garden and Landscape
   Waiko Road, Wailuku
   P O Box 1058
   Puunene HI 96784
   244-3804

5. Kula Ace Hardware and Nursery
   3600 Lower Kula Road
   Kula HI 96790
   876-0734
   * many natives in stock
   * get most of their plants from Ho'olawa Farms
   * they take special requests

6. Kulamanu Farms - Ann Carter
   Kula HI 96790
   878-1801

7. Maui Nui Botanical Gardens
   Kanaloa Avenue
   (Across from stadium)
   Kahului HI 96732
   249-2798

8. Native Gardenscapes
   Robin McMillan
   1330 Lower Kimo Drive
   Kula HI 96790
   870-1421

   * grows native plants and installs landscapes including irrigation.

9. Native Hawaiian Tree Source
   1630 Piiholo Road
   Makawao HI 96768
   572-6180

10. Native Nursery, LLC
    Jonathan Keyser
    250-3341

11. New Moon Enterprises - Pat Bily
    47 Kahoea Place
    Kula HI 96790
    878-2441

12. Waiakoa Tree Farm - Kua Rogoff
    Pukalani HI 96768
    Cell - 264-4166

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

September 23, 2008

Jeffrey K. Eng, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawai`i 96793

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Mr. Eng:

Thank you for your letter dated August 27, 2008 providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

The applicant would like to report that the West District Supervisor has been consulted, and it has been verified that the water meter which currently serves the project site measures 2 inches. This 2-inch meter is sufficient to meet demands for the proposed project, therefore, neither larger nor additional meters will be required.

The applicant would like to clarify that the existing irrigation well does not provide irrigation water for the tennis court area. This well currently only provides irrigation water for a portion of the Lahaina Civic Center amphitheater area. Although the irrigation pump is currently being replaced, there are no immediate plans to irrigate more area due to the well's limited capacity.

For the time being, the tennis court area will continue to be irrigated with domestic water. Implementing the project will result in a reduction of water use by about 11 percent from 18,800 gallons per day (gpd) to 16,700 gpd. The reduction is primarly due to a reduction in the planted area. The following table, based on details in the Preliminary Engineering Report, summarizes existing and projected average daily water use.

EXISTING AND PROJECTED AVERAGE DAILY WATER USE			
EXISTING USE	**AMOUNT**	**PROJECTED USE**	**AMOUNT**
Domestic	1,100 gpd	Domestic	1,100 gpd
Irrigation	17,700 gpd	Irrigation	17,700 gpd
		Projected Domestic	900 gpd
		Reduction in Irrigation	-8,800 gpd
		Projected Irrigation	5,800 gpd
Total	**18,800 gpd**	**Total**	**16,700 gpd**

The applicant concurs that the project site is served by 8-inch distribution lines and several fire hydrants located onsite. With regards to the proposed water system improvements mentioned in the Preliminary Engineering Report, the applicant will be in contact with the Engineering Division.

The applicant recognizes that water conservation is a priority. In the interest of reducing irrigation demands for landscaping, native plants will be utilized to the extent practicable. While optimally adapted to the relatively dry local environment, native plants also contribute to a Hawaiian sense of place.

Because the project site overlies the Honokowai aquifer, in proximity to the shoreline, appropriate measures will be taken to protect ground and surface water resources. During construction, the applicant will implement appropriate Best Management Practices to minimize infiltration and runoff resulting from operations.

Again, thank you for your comments on the proposed project. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
F:\DATA\RFE\LahainaCC Tennis\DWSDEASMA.res.wpd

Maui Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahului, Maui, HI 96733-6898 • (808) 871-846

JUL 2 3 2008

July 22, 2008

Ms. Tamara Horcajo, Director
Department of Parks and Recreation
Attention: Baron Sumida
700 Hali'a Nakoa Street, Unit 2
Wailuku, Hawai'i 96793

Dear Ms. Horcajo,

Subject: Proposed Expansion of Lahaina Civic Center Tennis Courts Complex
SM1 2008 0015
Lahaina, Maui, Hawaii
TMK: (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.)

Thank you for allowing us to comment on the Special Management Area Application and Draft Environmental Assessment for the proposed subject project, which was received on June 30, 2008.

In reviewing our records and the information received, Maui Electric Company (MECO) has no objection to the project at this time. As noted in our previous letter dated May 19, 2008 to Ms. Kimberly Skog of Munekiyo & Hiraga, Inc., we highly encourage the developer's electrical consultant to submit the electrical demand requirements and project time schedule as soon as practical so that service can be provided on a timely basis.

Should you have any other questions or concerns, please don't hesitate to contact me at 871-2345.

Sincerely,

Kimberly Vaitu'ulala
Engineer I

cc: Jeffrey Hunt, Director, Department of Planning
Kimberly Skog, Planner, Munekiyo & Hiraga

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY
KYLE GINOZA

August 20, 2008

Kimberly Vaitu'uala
Engineer I
Maui Electric Company, Ltd.
210 West Kamehameha Avenue
Kahului, Hawai`i 96732

SUBJECT: Draft Environmental Assessment (EA) and Special Management Area (SMA) Use Permit Application for the Proposed Expansion of Lahaina Civic Center Tennis Courts Complex; TMK (2) 4-5-021:010 (por.), 016 (por.), and 020 (por.) (SM1 2008/0015)

Dear Ms. Vaitu'uala:

Thank you for your letter dated July 22, 2008, providing comments on the subject project. On behalf of the applicant, County of Maui, Department of Parks and Recreation, we wish to provide the following information in response to your comments.

The applicant appreciates your comments regarding the provision of electrical service. Your letter will be forwarded to the electrical consultant who, as requested, will be in contact to submit the electrical demand requirements and project time schedule to your office, as soon as practicable.

Thank you again for your comments. Should you have any questions surrounding the subject project, please feel free to call me at 244-2015.

Very truly yours,

Kimberly Skog, Planner

KS:yp
cc: Baron Sumida, Department of Parks and Recreation
Livit Callentine, Department of Planning
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XI. REFERENCES

XI. REFERENCES

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APPENDIX A.

Archaeological Field Inspection

SCIENTIFIC CONSULTANT SERVICES, Inc.

711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Ronald M. Fukumoto, PE, LS
Ronald M. Fukumoto Engineering, Inc.
1721 Wili Pa Loop, Ste. 203
Wailuku, HI 96793

April 11, 2008

Re: Archaeological Field Inspection at the Lahaina Civic Center, Lahaina, Maui [TMK:4-5-21: 010 & 020]

Dear Mr. Fukumoto:

Scientific Consultant Services, Inc (SCS) conducted a systematic Field Inspection of 5.71 acres in Lahaina, Wahikuli Ahupua'a, Lahaina District, Maui Island [TMK 4-5-021:010 and 020]. The project area is bounded by a graded field to the east, Leiali'i Parkway to the south, the Lahaina Post Office to the west, and the Lahaina Health Center to the north.

Project Location and Natural Setting

The project area is situated at a variable elevation of 20-60 feet A.M.S.L. and lies less than 100 m from the coastline, across from Wahikuli State Wayside Park. Historic-period and recent grubbing and grading have altered the natural topography of the project area and approximately 70-80% of the study parcel is occupied by tennis courts and manicured lawns (read: built environment). The eastern portion of the project area contains abundant introduced grasses and *koa haole* (*Leucaena leucocephala*). The surface soil consists of stony silt loam. Modern trash (concrete fragments, pvc pipe) is scattered throughout unmanicured portions of the project area.

Methods

Systematic, 100% pedestrian survey was conducted on April 10, 2008 by SCS Inc. archaeologist David Perzinski, under the supervision of Michael Dega, Ph.D. (Principle Investigator). The survey included 100% survey of the project area by way of 5 m transects. Ground visibility was good. Notes were taken on landform, alterations, the presence/absence of surface features, and any potential for identifying cultural deposits in subsurface contexts.

Results

No traditional Hawaiian properties were identified within the study parcel. A basalt and concrete drainage was observed on the north side of the tennis courts and extends into the park grass area. This feature is historic-modern. An approximate 100 m long bulldozer push pile was observed running parallel to the eastern side of the tennis courts, within the non-landscaped area. In addition, pvc pipe was observed intermingled with boulders, which suggests recent grubbing.

Overall, no significant historic properties were identified during the Field Inspection and no areas were readily apparent to suggest subsurface cultural deposits. Soil in the area is predominantly composed of silt loam and silty clays, these likely overlying bedrock.

Recommendations

Based on the results of this Field Inspection and the large modifications to the surface of the project area within historic-recent times, no further archaeological work is recommended for this project area. The negative results achieved through this survey would most probably be duplicated if additional work is required.

Thank you again for contracting SCS for this Field Inspection. Please call (597-1182) or email (mike@scshawaii.com) if you have any questions or need additional information.

Best Regards,

Michael Dega, Ph.D.
Senior Archaeologist
Scientific Consultant Services, Inc.

APPENDIX B.

Cultural Impact Assessment

SCS Project Number 943-CIA-1

A CULTURAL IMPACT ASSESSMENT OF A PORTION OF THE LAHAINA CIVIC CENTER PARCEL, WAHIKULI AHUPUA`A, LAHAINA DISTRICT, MAUI ISLAND, HAWAI`I [TMK 4-5-021:010]

Prepared by:
Leann McGerty, B.A.
and
Robert L. Spear, Ph.D.
May 2008

Prepared for:
Ronald M. Fukumoto Engineering, Inc.
1721 Wili Pa Loop, Suite 203
Wailuku, Hawaii 96793

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INTRODUCTION

Scientific Consultant Services (SCS), Inc. has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment of a portion of the Lahaina Civic Center parcel, Wahikuli Ahupua`a, Lahaina District, Maui Island, Hawai`i [TMK: 4-5-021:010] (Figures 1, 2, and 3). According to exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposed plans for this lot portion includes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings.

The Constitution of the State of Hawai`i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua`a* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778" (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the peoples traditional right to subsistence. As a result in 1850, the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupua`a* tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawaiian Revised Statutes (HRS) 7-1. In 1992, the State of Hawai`i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, "native Hawaiian rights...may extend beyond the *ahupua`a* in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawaii (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes that:

> ...there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights...[H.B. No. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed land use or shoreline developments on the "cultural practices of the community and State" as part of the HRS Chapter 343 environmental review process (2001). Its purpose has broadened, "to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other

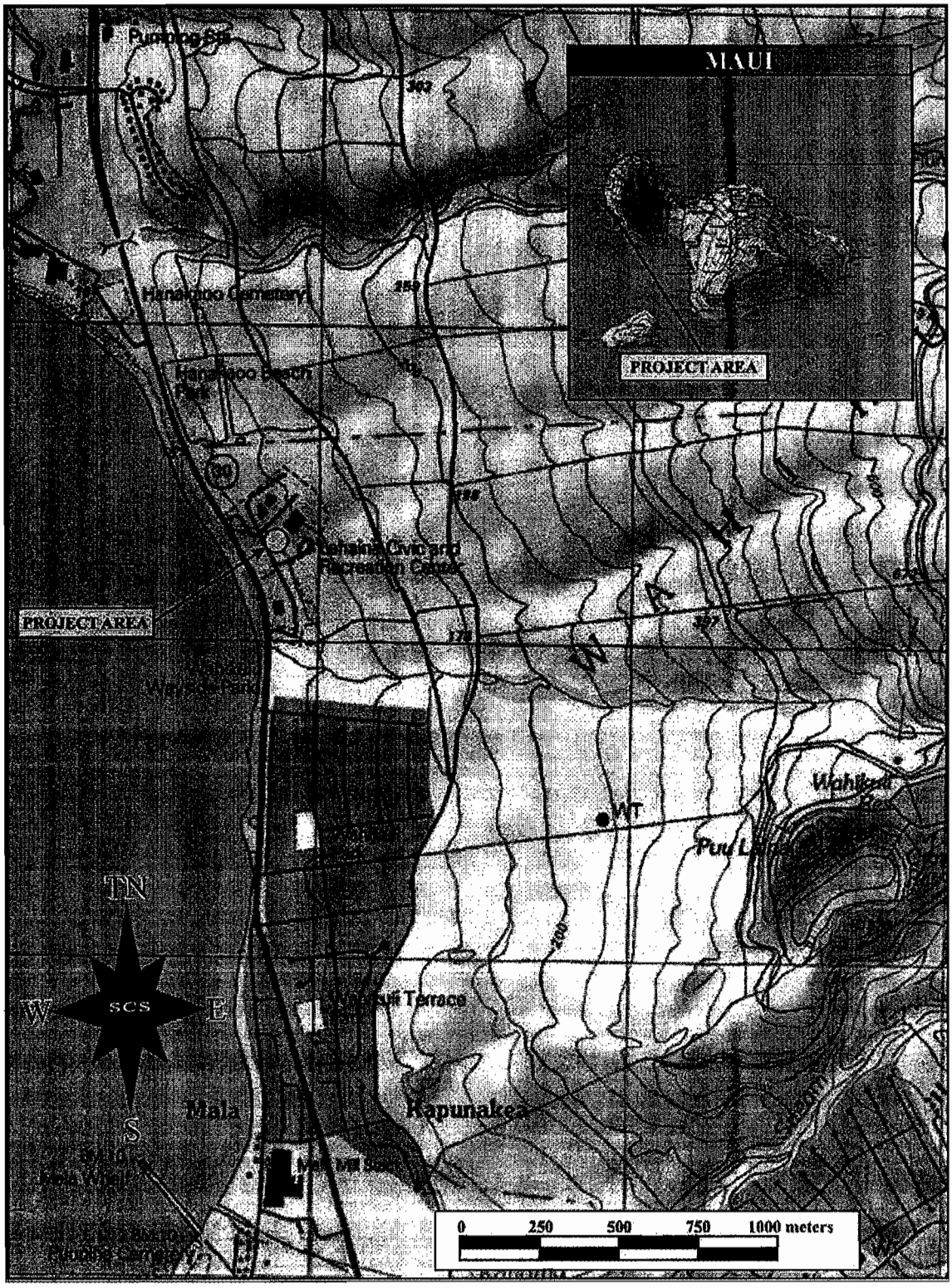

Figure 1: USGS Quadrangle Map Showing Project Area Location.

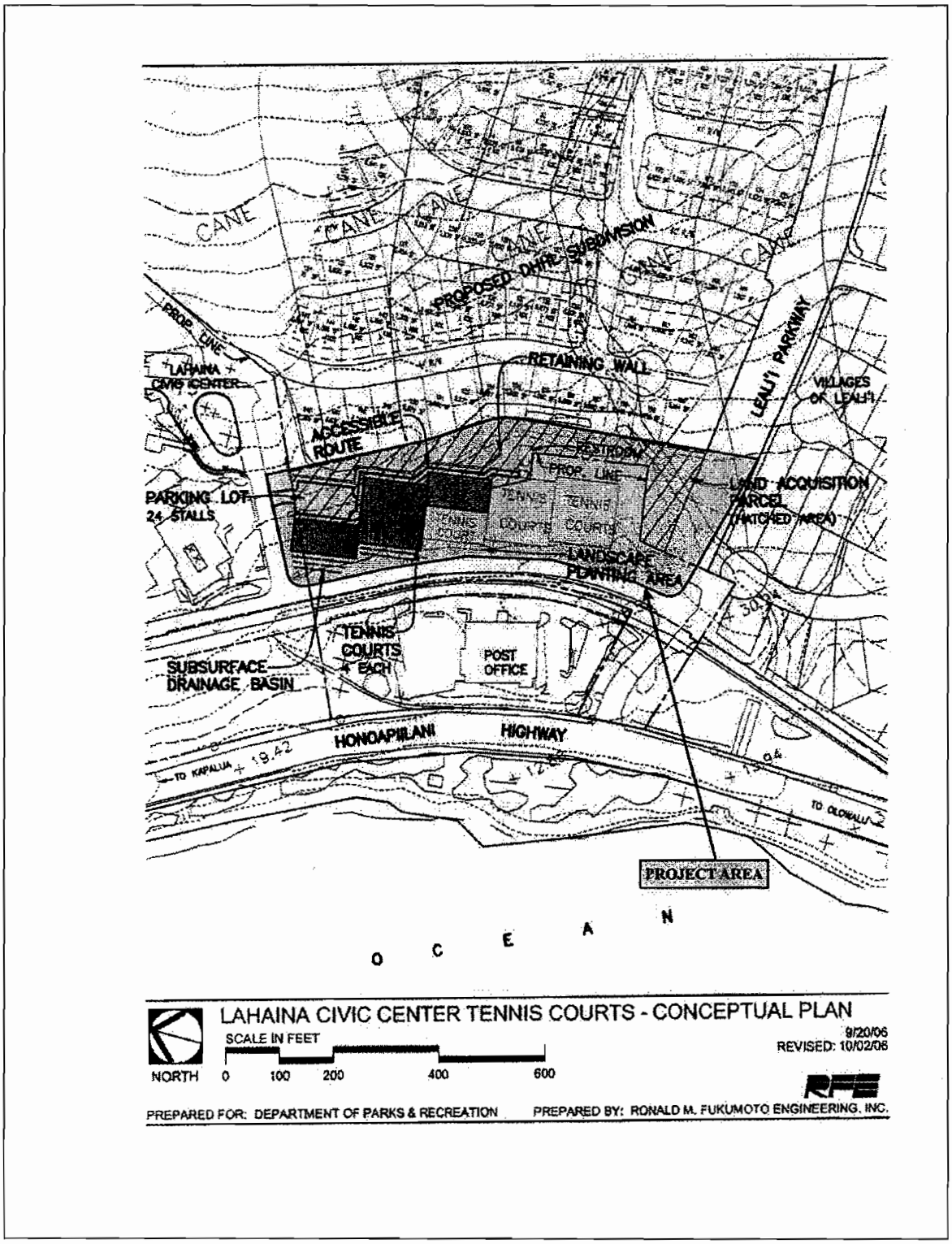

Figure 2: Plan View Map of Project Area (Courtesy of Ronald M. Fukumoto Engineering, Inc.)

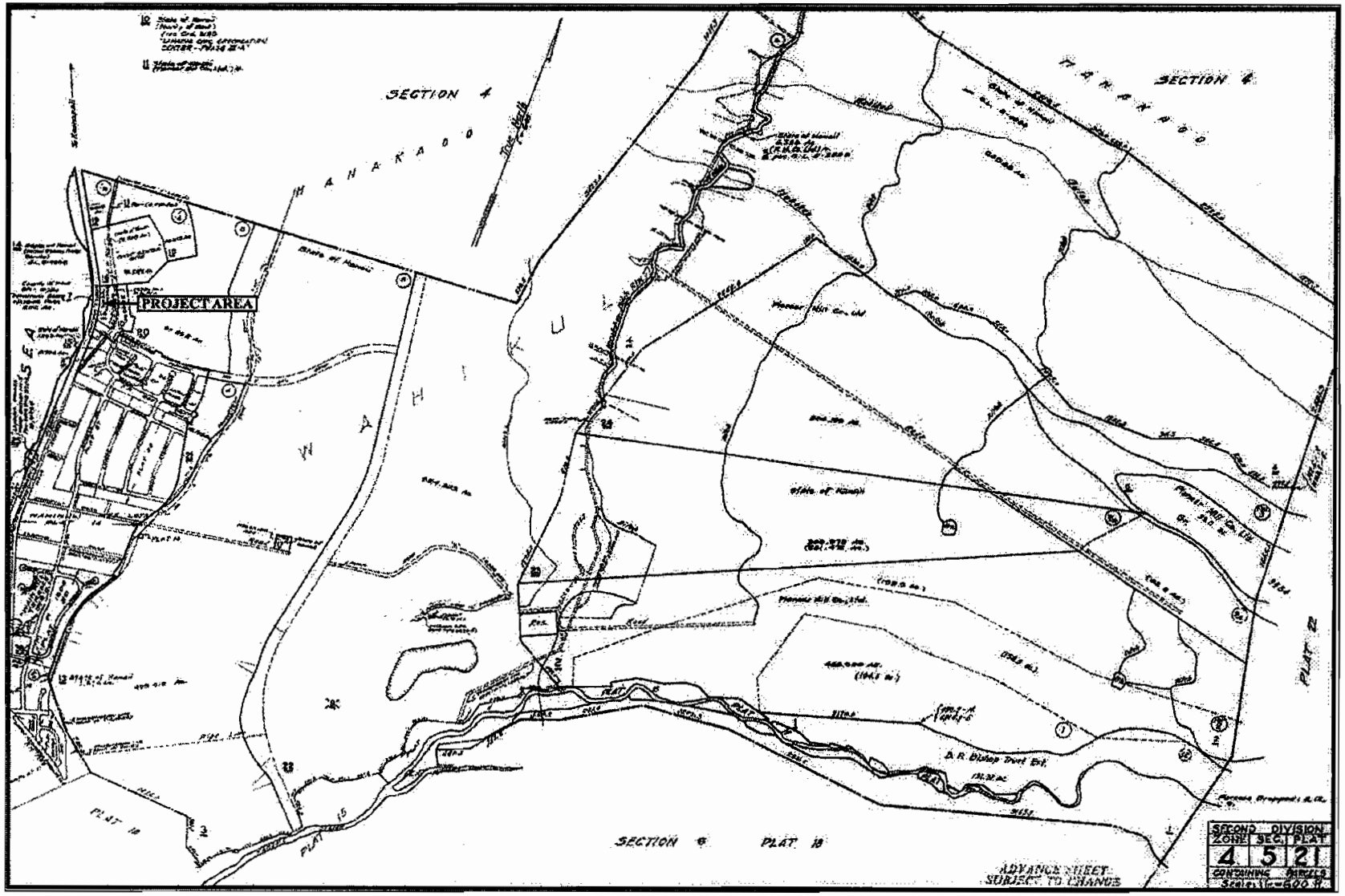

Figure 3: Tax Map Key [TMK] Showing Project Area.

ethnic groups, and it also amends the definition of 'significant effect' to be re-defined as "the sum of effects on the quality of the environment including actions that are...contrary to the State's environmental policies...or adversely affect the economic welfare, social welfare, or cultural practices of the community and State" (H.B. 2895, Act 50, 2000). Thus, not only are properties evaluated for impact to Native Hawaiians, but also for other ethnic groups as well.

Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized by using, as an example, "the broad geographical area, e.g. district or *ahupua`a*" (OEQC 1997). It was decided that the process should identify 'anthropological' cultural practices, rather than 'social' cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural which support such cultural beliefs.

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity (H.B. 2895, Act 50, 2000).

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the "Cultural Impact Assessment Methodology", the OEQC state:

> ...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories...[1997].

This report contains archival and documentary research, as well as communication with organizations having knowledge of, or believed to have knowledge of, the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

(1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints of limitations which might have affected the quality of the information obtained;

(2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;

(3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;

(4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;

(5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;

(6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;

(7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;

(8) an explanation of confidential information that has been withheld from public disclosure in the assessment;

(9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;

(10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;

(11) the inclusion of bibliography of references, and attached records of interviews which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. When telephone interviews occur, a summary of the information is often sent for correction and approval, or dictated by the informant and then incorporated into the document. Key topics discussed with the interviewees vary from project to

project, but usually include: personal association to the *ahupua`a*, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; evidence of previous cultural activities identified in the project area.

In this case, letters, briefly outlining the development plans along with maps of the project area, were sent to organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Consultation was sought from the Maui Office of Hawaiian Affairs, Community Resource Coordinator, Maui (Thelma Shimaoka); the Office of Hawaiian Affairs, O`ahu (Kai Markell); the Cultural Resources Commission of Planning Maui Planning Department; Nā Kupuna O Maui (Patty Nishiyama); Hinano Rodrigues, the Cultural Historian with the State Historic Preservation Division, Holuamoku Ralar of the Hawaiian Civic Club, Lahaina Chapter; Kamika Kepa`a, a member of the Native Hawaiian Historic Preservation Council; and Ke`eaumoku Kapu with Kuleana Ku`ikāhi. If cultural resources are identified based on the information received from these organizations and additional informants, an assessment of the potential effects on the identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

PROJECT AREA AND VICINITY

The project area is located on a portion of State-owned land which will be acquired by the County adjacent to the Lahaina Civic Center. The Maui Planning Department has determined that the project area is within the Special Management Area (see Figures 2 and 3).

CULTURAL HISTORICAL CONTEXT

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. Pu`u Kukui, forming the west end of the island (1,215m above mean sea level), is composed of large, heavily eroded amphitheater valleys that contain well-developed permanent stream systems that watered fertile agricultural lands extending to the coast. The deep valleys of West Maui and their associated coastal regions have been witness to many battles in ancient times and were coveted productive landscapes.

PAST POLITICAL BOUNDARIES

Traditionally, the division of Maui's lands into districts (*moku*) and sub-districts was performed by a *kahuna* (priest, expert) named Kalaiha`ōhia, during the time of the *ali`i* Kaka`alaneo (Beckwith 1940:383; Fornander places Kaka`alaneo at the end of the 15th century or the beginning of the 16th century [Fornander 1919-20, Vol. 6:248]). Land was considered the property of the king or *ali`i `ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. The title of *ali`i `ai moku* ensured rights and responsibilities pertaining to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms, such as *moku, ahupua`a, `ili* or *`ili`ā ina* were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*) which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili `āina* or *`ili* were smaller land divisions next to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was located (*ibid*:33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *`ili*. The land holding of a tenant or *hoa `āina* residing in a *ahupua`a* was called a *kuleana* (Lucas 1995:61). The project area is located in the *ahupua`a* of Hanakaō`ō, which translated means literally "the digging stick bay" and perhaps refers to the gardens known in the area (Pukui *et al.*:74).

TRADITIONAL SETTLEMENT PATTERNS

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua`a*. During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinaruma*) and *mai`a* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *`uala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985). Agricultural development on the leeward side of Maui

was likely to have begun early in what is known as the Expansion Period (AD 1200-1400, Kirch 1985).

***WAHI PANA* (LEGENDARY PLACES)**

Scattered amongst the agricultural and habitation sites were other places of cultural significance to the *kama`āina* of the district. At least eight *heiau* were recorded in the vicinity of the ancient village of Lāhainā (old pronunciation of Lahaina), fishing *ko`a* (shrine) were present along the beach and on the slopes above the bays, and petroglyphs were inscribed in many places whose meanings have yet to be fully understood (Thrum 1908, 1916, 1917; Walker 1930:103). Pearl shell was gathered from Makaiwa Beach for the eyes of the *ki`i* (image, picture) and battles were fought along the coast (Sterling 1998:45). A portion of the paved trail built by Kihapi`ilani, son of the great chief Pi`ilani, was identified along the Kā`anapali coast (Sterling 1998).

To the north was Pu`u Keka`a, made famous by being the birthplace of the sons of chiefs and long associated with ghosts, strange occurrences, and the skeletons of defeated invaders (Fornander 1918–19, Vol. 5:542). In Fornander, S. Kaha stated:

> Concerning the great amount of human bones at this place. On account of the great number of people at this place there are numerous skeletons [this was the vicinity of several bloody battles], as if thousands of people died there; it is there that the Lahainaluna students go to get skeletons for them when they are studying anatomy. The bones are plentiful there; they completely cover the sand.
>
> This is a ghostly place. Some time a number of people came from Kaanapali (from the other side) going to Lahaina in the dark. When they came to Kekaa stones rolled down from the top of the hill without any cause. Listening to it, it seemed as if the hill was tumbling down; the people going along were startled and they explained, Kekaa is ghostly! Kekaa is ghostly!" Certainly this is a strange thing for this hill to do [*Ibid*].

It was also believed that Pu`u Ka`a was a *leina a ka`uhane*, or soul's leap similar to O`ahu's Ka`ena Point. Naha says:

> It is said that when a person dies his spirit journeys to Kekaa; if he has a friend there who had previously died, that one would drive it away when the spirit is nearing Kekaa. Sometimes the spirit of a person would return and re-enter the body, and cause it to come to life again; that is what happened to those who are living again.

> Many souls came to this place Kekaa. It is called the Leina-a-ka-uhane, the leaping place of the soul...[*Ibid*].

According to legend, the lands surrounding Pu`u Keka`a were once areas of intense cultivation and the capital and home of the Maui chief, Kaka`alaneo, when he ruled West Maui. Kaka`alaneo lived on the *pu`u* with his wife, a chiefess from Moloka`i.

> Kekaa was the capitol of Maui when Kalaalaneo was reigning over West Maui...Many houses were constructed and people cultivated a great deal of potatoes, bananas, sugar cane, and things of a like nature. I have been told that the country from Kekaa to Hahakea and Wahikuli –that country now covered by cactus, in a northwesterly direction for Lahaina-was all cultivated. This chief [Kakaalaneo] also planted bread fruit and kukui trees down at Lahaina. Some of these trees southwest of the Lahaina fort, were called the bread fruit trees of Kauheana [Fornander 5:540–541].

Kaka`alaneo's possessions included fishponds in Hana and a famous breadfruit grove he planted outside of Lāhainā (Handy and Handy 1972). His son, Ka`ulula`au, became famous for traveling around Lāna`i fighting ghosts (Sterling 1998). Maui, the demi-god himself, was associated with the hill:

> At Kekaa lived Maui and Moemoe...The great desire of one [Moemoe] was to sleep. The other [Maui] desired to travel. When Moemoe slept, Maui was traveling, each according to his taste...[Moemoe] made up his mind...to search for his friend, Maui. A road on the northeast side of Kekaa was named after one of these men; it is called "Ke alanui kikeekee a Maui"-the zig zag pathway of Maui" [Fornander 1918-19, Vol. 5:540–544].

> It is recorded that Pu`ū Keka`a was the burial place for Kekaulike's oldest son, Kauhi`aimoku-a-kama who was defeated by his brother and Uncle at the Battle of Koko-o-na-moku further south at Makaiwa Beach (Sterling 1998). Kahekili succeeded his brother Kamehameha-Nui as ruler of Maui and to prove he was a true descendant of the gods, he leapt from the `Ū-ha-ne lele or Soul-Leaping Place of Maui. No ordinary man would dare to do this (*Ibid.*).

LĀHAINĀ DISTRICT SETTLEMENT PATTERNS

In Hawai`i, much of the coastal lands were preferred for chiefly residence. Easily accessible resources such as offshore and onshore fish ponds, the sea with its fishing and

surfing—known as the sports of kings, and some of the most extensive and fertile wet taro lands were located in the area (Kirch and Sahlins, 1992 Vol. 1:19). Inland resources necessary for subsistence, could easily be brought to the *ali`i* residences on the coast from nearby inland plantations. The majority of farming was situated in the lower portions of stream valleys where there were broader alluvial flat lands or on bends in the streams where alluvial terraces could be modified to take advantage of the stream flow. Dry land cultivation occurred in colluvial areas at the base of gulch walls or on flat slopes (Kirch 1985; Kirch and Sahlins 1992, Vol. 2:59). Lāhainā had the added advantage of a calm roadstead and close proximity to Lāna`i, and Moloka`i (Handy and Handy 1972).

Trails extended from the coast to the mountains, linking the two for both economic and social reasons. A trail known as the *alanui* or "King's trail" built by Kihapi`ilani, extended along the coast passing through all the major communities between Lāhainā and Mākena, After the conquest of Maui by Kamehameha I, Lāhainā became the capitol of the Hawaiian Kingdom until it moved to Honolulu in 1855.

From early times, Lāhainā was favored by the *ali`i*. Kahekili, who became ruler of Maui in the 1700s, maintained his home and royal court here until his death in 1794. After laying waste to Lāhainā in the process of subjugating Maui, Kamehameha I proceeded to O`ahu, where he finally united all the islands (except Kaua`i) under his rule. He later returned and established residence and his seat of government in Lāhainā, constructing the first brick house in the town a short way north of the project area. During Kamehameha's time, Lāhainā thrived as a center for the lucrative sandalwood trade. His son, Liholiho, and his wife resided in Lāhainā until they sailed to England in 1823 never to return alive to their kingdom. Kamehameha III (Kauikeaouli) built a new royal residence, a complex of fine, thatched-roofed houses, for his entourage called Pākalā. In addition, he began to construct a palace of coral rock, two stories high, known as Hale Piula, close to the sea.

Whaling ships began coming to Hawai`i by the hundreds in the 1820s. The peak year of 1859 brought 549 whaling ships to the roadstead. Lāhainā became saturated with sailors, whalers, deserters, and other unsavory types as well as western businessmen. Soon missionaries followed to set straight, both sailor and Hawaiian, and to impose their foreign standards on the population, whether they wanted it or not. The golden age of whaling was between 1843 and 1860, when Lāhainā underwent a building frenzy initiated by those hoping to buy and sell and make their fortune. Kamehameha III built a private residential complex on the Moku`ula, a tiny island located in a freshwater fishpond near the project area. The death of his sister,

Nāhe`ena`ena, affected the king deeply. He had her body and that of their mother brought to Moku`ula where they were laid to rest in a specially constructed mausoleum and where he was to reside for the next eight years. In 1845, the court moved to O`ahu, as the port of Honolulu had become the commercial center oaf the kingdom.

Ethnographic and historic literature, often our only link to the past, reveals that the land around Lāhainā was rich in agricultural areas irrigated by aqueducts originating in well-watered valleys with permanent occupation predominately on the coast. Handy and Handy have stated the space cultivated by the natives of Lāhainā at about "...three leagues [9 miles] in length, and one in its greatest breadth. Beyond this all is dry and barren; everything recalls the image of desolation" (1972:593). Crops cultivated included coconut, breadfruit, paper mulberry, banana, taro, sweet potato, sugar cane, and gourds.

Menzies, the naturalist and surgeon on board HMS Discovery during Captain George Vancouver's 1793 tour, made these observations of the Lāhainā coast and village:

> [We]...soon entered the verge of the woods where we observed the rugged bands of a large rivulet that came out of the chasm cultivated and watered with great neatness and industry. Even the shelving cliffs of rock were planted with esculent roots, banked in and watered by aqueducts from the rivulet with as much art as if their level had been taken by the most ingenious engineer...[Menzies 1920:105].
>
> ...to see the village of Lahaina, which we could scattered along shore on a low tract of land that was nearly divided into little fields and laid out in the highest state of cultivation and improvement by being planted in the most regulated manner with the different esculent roots and useful vegetables of the country, and watered at pleasure by aqueducts that ran here and there along the banks intersecting the fields, and in this manner branching through the greatest part of the plantation [Menzies 1920:112].

Little had changed twenty-six years later when J. Arago visited Hawai`i with Captain Louis de Freycinet in 1819. He recorded:

> The environs of Lahaina are like a garden. It would be difficult to find a soil more fertile, or a people who can turn it to greater advantage...various sorts of vegetables and plants...amongst which we distinguish the Caribee-cabbage, named here taro; double rows of banana, bread-fruit, cocoa-nut, palma-christi, and

> the paper-mulberry trees...[Arago cited in Handy and Handy 1972:493].

Rev. C.S. Stewart, a missionary in 1823 assigned to the Lāhainā station, also commented on the attractiveness of the environs:

> The settlement is far more beautiful than any place we have yet seen on the Islands. The entire district stretching nearly three miles along the seaside, is covered with luxuriant groves, not only of the cocoanut, the only tree we have before seen except on the tops of the mountains, but also of the breadfruit and the kou...while the banana plant, kappa and sugar-cane are abundant, and extend almost to the beach, on which a fine surf constantly rolls [Taylor 1928:42].
>
> ...The breadfruit trees stand as thickly as those of a regularly planted orchard, and beneath them are kalo patches and fishponds, 20 or 30 yards square, filled with stagnant water, and interspersed with kappa trees, groves of banana, rows of the sugar cane, and bunches of the potato and melon...It scarcely ever rains, not oftener, we are told, than half a dozen times during the year, and the land is watered entirely by conducting streams, which rush from the mountains, by artificial courses, on every plantation. Each farmer has a right, established by custom, to the water every fifth day [Taylor 1928:43].

THE GREAT MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169-70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I:145). The Great Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were thus made available and private ownership was instituted, the *maka`āinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living. These claims did not include any previously cultivated but presently fallow land, *`okipū* (on O`ahu), stream fisheries, or many other resources necessary for traditional survival (Kelly 1983; Kame`eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and

issued a Royal Patent after which they could take possession of the property (Chinen 1961:16). There were no awarded LCAs in the vicinity of the project area (Waihona `Aina Data Base 2006). According to Puku`i *et al.* (1974:218), Wahikuli literally means "noisy place".

HISTORIC LAND USE

Lāhainā, long the port of choice and where commercial endeavors had succeeded the traditional economy, suffered with the demise of the whaling industry and the change in Capitol of the Hawaiian Kingdom to Honolulu. By the mid-1800s the Kā`anapali area was being converted from traditional agriculture to commercial sugar cane. As early as 1849, Judge A.W. Parsons operated a sugar mill in Lāhainā. Henry Dickenson began a sugar plantation in 1859 that was quickly followed by the Pioneer Mill Co. By 1883, Pioneer Mill Co. had assets in excess of $50,000,000 (Simpich 1974). Pioneer Mill's railroad extended from the center of Lāhainā Village to a point north of the town of Pu`ukoli`i in Hanaka`ō`ō and was as close as 350 feet above mean sea level at its northern end (Condé 1975). Pioneer Mill Co. reorganized in 1900 at which time its cane fields were located along the coast for 10 miles with some areas extending back as far as two and one half miles:

> The bulk of the crop is raised on lands that range from 10 feet to 700 feet elevation above sea level; the highest being cultivated at 1500 feet [Condé and Best 1973:254].

Sugar was processed and bagged at the mill in Lāhainā and then taken by train to the landing at Pu`u Keka`a (Black Rock). Other buildings had been constructed there to aid in the plantations activities, such as oil and molasses tanks, as well as a pavilion and some beach cottages on the beach for the use of Pioneer Mill Company's personnel (Clark 1980:61). To add to the enjoyment, a quarter-mile track had been constructed on the tidal flats (previously the site of the Battle of Koko-o-na-moku) behind Hanaka`ō`ō for horse racing on holidays. The Kā`anapali Landing was abandoned before World War II and by 1957 plans were in motion for a multi-million dollar resort to be built around Pu`u Keka`a. The shift to tourism in the 1950s sent the plantations into decline, however, the development of golf courses, hotels, condominiums, and shops have continued the popularity of Lahaina up to and including the present.

SUMMARY

The "level of effort undertaken" to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people

who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be a "good faith effort". However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort might mean an entirely different level of research activity.

In the case of the present parcel, letters of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from the Maui Office of Hawaiian Affairs, Community Resource Coordinator, Maui (Thelma Shimaoka); the Office of Hawaiian Affairs, O`ahu (Kai Markell); the Cultural Resources Commission of Planning Maui Planning Department; Nā Kupuna O Maui (Patty Nishiyama); Hinano Rodrigues, the Cultural Historian with the State Historic Preservation Division, Holuamoku Ralar of the Hawaiian Civic Club, Lahaina Chapter; Kamika Kepa`a, a member of the Native Hawaiian Historic Preservation Council; and Ke`eaumoku Kapu with Kuleana Ku`ikāhi.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as I`i, Kamakau, Beckwith, Chinen, Kame`eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku`i and Elbert, Thrum, Sterling, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai`i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona `Aina 2005 Data base.

CULTURAL ASSESSMENT

Analysis of the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). To our knowledge, the project area has not been used for traditional cultural purposes within the recent past. Based on historical research and the lack of response at the time of this reports production (May 22, 2008), from the Maui Office of Hawaiian Affairs, Community Resource Coordinator, Maui (Thelma Shimaoka); the Office of Hawaiian Affairs, O`ahu (Kai Markell); the Cultural Resources Commission of

Planning Maui Planning Department; Nā Kupuna O Maui (Patty Nishiyama); Hinano Rodrigues, the Cultural Historian with the State Historic Preservation Division, Holuamoku Ralar of the Hawaiian Civic Club, Lahaina Chapter; Kamika Kepa`a, a member of the Native Hawaiian Historic Preservation Council; and Ke`eaumoku Kapu with Kuleana Ku`ikāhi, it is reasonable to conclude that, pursuant to Act 50, the exercise of Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities within the project parcel will not be affected and there will be no direct adverse effect upon cultural practices or beliefs.

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APPENDIX A: CONSULTATION REQUSTS

(No figures included)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Holouamoku Ralar
Hawaiian Civic Club, Lahaina Chapter
P.O. Box 10965
Lahaina, Hawai'i 96761

Dear Holouamoku:

Scientific Consultant Services, Inc. (SCS) has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment (CIA) on a portion of the Lahaina Civic Center site, Lahaina District, Maui (TMK: 4-5-021:010). Exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings. As you know, this involves assessing the probability of impacting cultural values and rights within the project area. According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs…The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural which support such cultural beliefs…

We are asking you for any information that might contribute to the knowledge of traditional activities, or traditional rights that might be impacted by the project's proposed construction. The assessment results are dependent on the response and contributions made by individuals and organizations such as yours.

Enclosed are maps showing the proposed project area. Please contact me at our SCS Honolulu office at (808) 597-1182; my cell phone, 225-2355; or home, (808) 637-9539, with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

Ph: 808-597-1182 SCS... SERVING ALL YOUR ARCHAEOLOGICAL NEEDS Fax: 808-597-1193
Neighbor Island Offices • Hawai'i Island • Maui • Kaua'i

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Patty Nishiyama
Na Kupuna O Maui
320 Kaeo Place
Lahaina, Hawaii 96761

May 1, 2008

Dear Ms. Nishiyama:

Scientific Consultant Services, Inc. (SCS) has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment (CIA) on a portion of the Lahaina Civic Center site, Lahaina District, Maui (TMK: 4-5-021:010). Exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings. As you know, this involves assessing the probability of impacting cultural values and rights within the project area. According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

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Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Kai Markell
Director of Native Rights
C/o Office of Hawaiian Affairs
711 Kapi'olani Blvd, Suite 500
Honolulu, HI 96813

May 1, 2008

Dear Mr. Markell:

Scientific Consultant Services, Inc. (SCS) has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment (CIA) on a portion of the Lahaina Civic Center site, Lahaina District, Maui (TMK: 4-5-021:010). Exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings. As you know, this involves assessing the probability of impacting cultural values and rights within the project area. According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

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Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Thelma Shimaoka
c/o Office of Hawaiian Affairs
140 Hoohana St.
Suite 206
Kahului, HI 96732

May 1, 2008

Dear Ms. Shimaoka:

Scientific Consultant Services, Inc. (SCS) has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment (CIA) on a portion of the Lahaina Civic Center site, Lahaina District, Maui (TMK: 4-5-021:010). Exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings. As you know, this involves assessing the probability of impacting cultural values and rights within the project area. According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

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Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

May 1, 2008

County of Maui
Department of Planning
Cultural Resources Commission
250 S. High Street
Wailuku, HI 96793

Dear Sir or Madam:

Scientific Consultant Services, Inc. (SCS) has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment (CIA) on a portion of the Lahaina Civic Center site, Lahaina District, Maui (TMK: 4-5-021:010). Exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings. As you know, this involves assessing the probability of impacting cultural values and rights within the project area. According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

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Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

May 1, 2008

Hinano Rodrigues, Cultural Historian
DLNR Maui Office
130 Mahalani Street
Wailuku, HI 96791

Dear Hinano:

Scientific Consultant Services, Inc. (SCS) has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment (CIA) on a portion of the Lahaina Civic Center site, Lahaina District, Maui (TMK: 4-5-021:010). Exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings. As you know, this involves assessing the probability of impacting cultural values and rights within the project area. According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

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Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Ke'eaumoku and U'i Kapu
Kuleana Kuikahi, LLC.
P.O. Box 11524
Lahaina, Maui 96791

May 1, 2008

Dear Mr. and Mrs. Kapu:

Scientific Consultant Services, Inc. (SCS) has been contracted by Ronald M. Fukumoto Engineering, Inc., to conduct a Cultural Impact Assessment (CIA) on a portion of the Lahaina Civic Center site, Lahaina District, Maui (TMK: 4-5-021:010). Exhibits provided by Ronald M. Fukumoto Engineering, Inc., proposes the construction of four tennis courts, 24-stall parking lot, an accessible walkway, and landscaping plantings. As you know, this involves assessing the probability of impacting cultural values and rights within the project area. According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

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Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

Ph: 808-597-1182 SCS... SERVING ALL YOUR ARCHAEOLOGICAL NEEDS Fax: 808-597-1193
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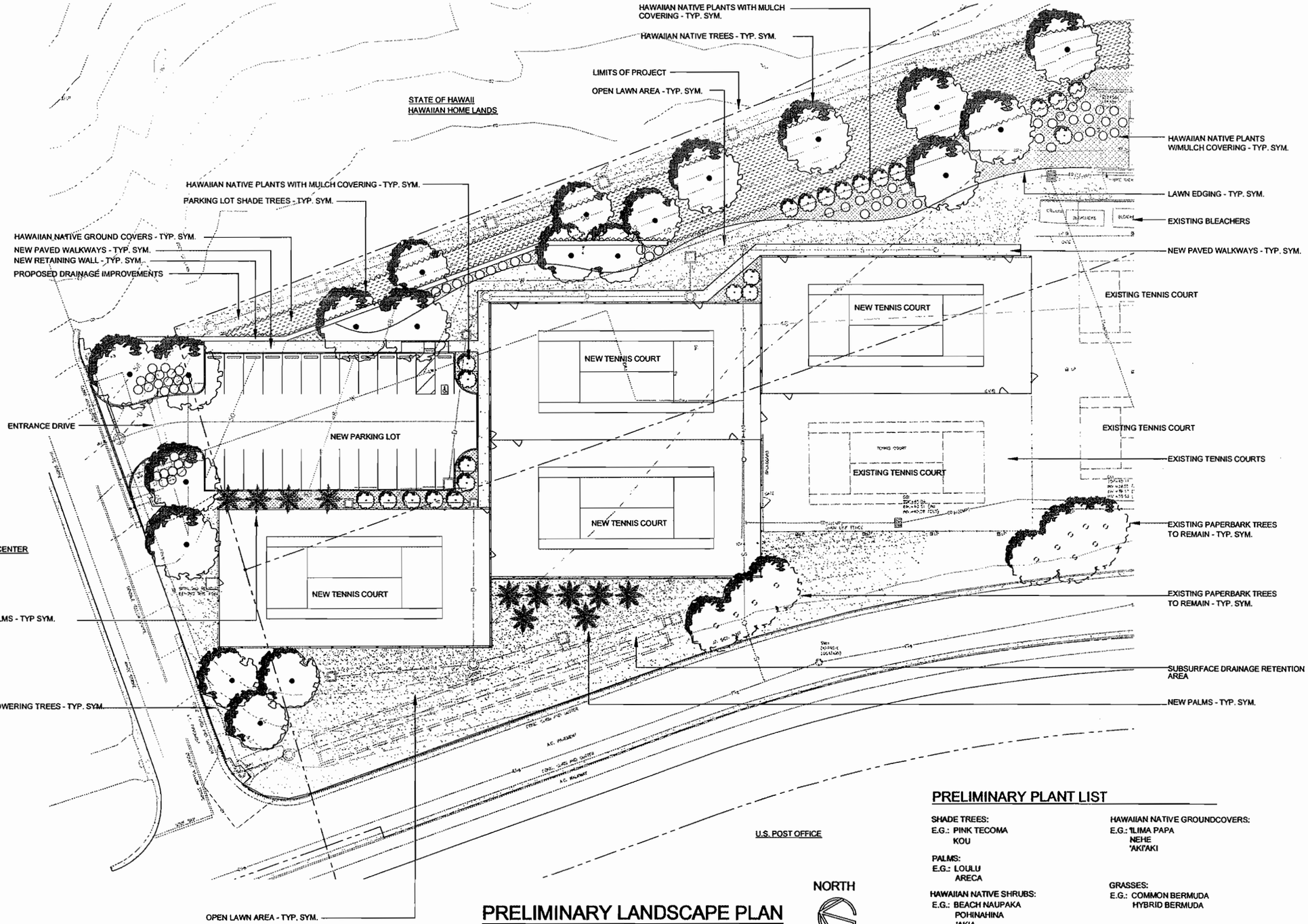
APPENDIX C.

Preliminary Landscape Plan



PRELIMINARY LANDSCAPE PLAN

NORTH

SCALE: 1" = 20' - 0"

PRELIMINARY PLANT LIST

SHADE TREES:
E.G.: PINK TECOMA
KOU

PALMS:
E.G.: LOULU
ARECA

HAWAIIAN NATIVE SHRUBS:
E.G.: BEACH NAUPAKA
POHINAHINA
'AKIA
MA'O
'ULEI
KOKI'O KE'OKE'O

HAWAIIAN NATIVE GROUNDCOVERS:
E.G.: 'ILIMA PAPA
NEHE
'AKI'AKI

GRASSES:
E.G.: COMMON BERMUDA
HYBRID BERMUDA

RUSSEL Y. GUSHI
LANDSCAPE
ARCHITECT

44 SOUTH MARKET STREET
P.O. BOX 1411
WAILUKU, MAUI, HAWAII 96793
TEL.: (808) 242-6503 FAX. (808) 244-0131
e-mail: rygushi.maui@hawaiiantel.net

RUSSEL Y. GUSHI
LICENSED PROFESSIONAL LANDSCAPE ARCHITECT
No. 6032
HAWAII, U.S.A.

EXP. 04/2010

LAHAINA CIVIC CENTER TENNIS COMPLEX
at
LAHAINA, MAUI, HAWAII

PRELIMINARY LANDSCAPE PLAN

Project No:
Drawn By: RYG
Designed By: RYG
Checked By: RYG
Date: May 16, 2008
Revisions:

Sheet :

LP-1

of Sheets

APPENDIX D.

Traffic Impact Assessment Report

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8206 FAX: (808) 239-4175 Email:prowell@gte.net

May 19, 2008

Ronald M. Fukumoto Engineering, Inc.
1721 Wili Pa Loop, Suite 203
Wailuku, Maui, HI 96793

Attn: Mr. Ronald Fukumoto

Re: **Traffic Impact Assessment Report**
Proposed Lahaina Civic Center Tennis Courts

Dear Mr. Fukumoto:

Phillip Rowell and Associates have completed the following Traffic Impact Assessment Report for the proposed new tennis courts at the Lahaina Civic Center. The report is presented in the following format:

A. Project Location and Description
B. Purpose and Objective of Study
C. Methodology
D. Description of Existing Streets and Intersection Controls
E. Existing Peak Hour Traffic Volumes
F. Level-of-Service Concept
G. Existing Levels-of-Service
H. 2010 Background Traffic Projections
I. Project Trip Generation
J. 2010 Background Plus Project Traffic Projections
K. Impact Analysis of 2010 Conditions
L. Mitigation
M. Other Issues
N. Summary and Conclusions

A. Project Location and Description

The proposed project is located adjacent to the existing tennis courts at the Lahaina Civic Center and consist of four (4) additional tennis courts. See Attachment A.

Access to and egress from the project will be via the intersection of Honoapiilani Highway at Lealiʻi Parkway.

B. Purpose and Objective of Study

1. Quantify and describe the traffic related characteristics of the proposed project.

2. Identify potential deficiencies adjacent to the project that will impact traffic operations in the vicinity of the proposed project.

C. Methodology

1. *Define the Study Area*

The first step in defining the study area was to estimate the number of peak hour trips that the proposed project will generate. It was estimated that the project will generate 7 trips during the morning peak hour and 16 trips during the afternoon peak hour. Typically, the study area would be limited to the access and egress point closest to the project, the intersection of Honoapiilani Highway at Leali'i Parkway. However, because of the sensitivity of area's community to traffic, the study area was expanded to the next adjacent major intersections north of and south of Leali'i Parkway. Thus, the study area includes the following intersections:

- Honoapiilani Highway at Leali'i Parkway
- Honoapiilani Highway at Front Street
- Honopiilani Highway at Kaanapali Parkway

2. *Analyze Existing Traffic Conditions*

Existing traffic volumes at the study intersections were obtained from traffic counts completed October and November, 2005 for the Honoapiilani Highway traffic signal coordination project[1]. These counts were considered valid based of additional traffic counts at the intersection of Honoapiilani Highway at Lahainaluna Street that concluded that traffic along morning peak hour traffic along Honoapiilani Highway decreased 8% between 2005 and 2006 and that during the afternoon peak hour, northbound traffic along Honoapiilani Highway decreased 9%. Southbound traffic during the afternoon peak hour did not change.

The intersection configurations and right-of-way controls were verified during a field reconnaissance of the study area during May 2008. Existing traffic operating conditions of the study intersection were determined using the methodology described in the 2000 *Highway Capacity Manual* (HCM)[2].

3. *Estimate Horizon Year Background Traffic Projections*

Background traffic conditions are defined as future traffic conditions <u>without</u> the proposed project and are estimated by superimposing traffic generated by related projects in the vicinity onto existing traffic volumes.

The year 2010 was used as the horizon year. This does not necessarily represent the project completion date. It represents a date for which future background traffic projections were estimated. The year 2010 is also consistent with recently completed traffic studies in the area.

Horizon year background traffic conditions were estimated using background traffic growth rates provided in the *Maui Long Range Land Transportation Plan*, adding traffic generated by anticipated development in the area and adjusting the estimated traffic volumes to account for new roadways in the area.

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[1] Austin, Tsutsumi & Associates, *Traffic Signal Synchronization of Honoapiilani Highway from Shaw Street to Lower Honoapiilani Highway*, May 15, 2006

[2] *Highway Capacity Manual*, Institute of Transportation Engineers, Washington, D.C., 2000

4. *Estimate Project-Related Traffic Characteristics*

The number peak-hour trips that the proposed project will generate was estimated using standard trip generation procedures outlined in the *Trip Generation Handbook*[3] and data provided in *Trip Generation*[4]. These trips were distributed and assigned based on the available approach and departure routes and trip distribution data from other recently completed traffic studies in the area.

5. *Analyze Project Related Traffic Impacts*

The project-related traffic was then superimposed on 2010 background traffic volumes at the study intersections. The traffic impacts of the project were assessed by analyzing the changes in traffic volumes and levels-of-service at the study intersections. The purpose of this analysis was to identify potential operational deficiencies in the vicinity of the proposed project.

D. Description of Existing Streets and Intersection Controls

A schematic diagram indicating the existing lane configurations and right-of-way controls of the study intersections is presented as Attachment B.

Honoapiilani Highway is a four-lane, undivided highway with a north-south orientation. The posted speed limit is 40 miles per hour in both directions. The study intersections along Honoapiilani Highway are signalized with separate left turn lane and separate left turn phases for the northbound and southbound approaches.

E. Existing Peak Hour Traffic Volumes

The existing morning and afternoon peak hour traffic volumes are summarized in Attachment C.

1. The traffic counts include buses, trucks and other large vehicles. Mopeds and Bicycles were not counted.

2. The midday peak hour was not analyzed based on the traffic data contained in the Honoapiilani Highway signalization project that indicated that the morning commute and midday peak hours were comparable.

3. The traffic volumes of adjacent intersections may not match the volumes shown for an adjacent intersection because the peak hours of the adjacent intersections may not coincide and there are driveways between the intersections.

4. Pedestrian activity was negligible.

F. Level-of-Service Concept

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 1. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents

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[3] *Trip Generation Handbook*, Institute of Transportation Engineers, Washington, D.C., 1998

[4] *Trip Generation*, Institute of Transportation Engineers, Washington, D.C., 2003

severe congestion with stop-and-go conditions. Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Table 1 Level-of-Service Definitions for Signalized Intersections[1]

Level of Service	Interpretation	Volume-to-Capacity Ratio[2]	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<20.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	20.1-35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	35.1-55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	55.1-80.0
F	Total breakdown with stop-and-go operation	>1.001	>80.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 2 summarizes the definitions for level-of-service and the corresponding delay. A subsequent calculation to determine an overall LOS was made, and these results are presented in tables to summarize traffic conditions using parameters similar to those used for signalized intersections.

Table 2 Level-of-Service Definitions for Unsignalized Intersections[1]

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.1

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

G. Existing Levels-of-Service

The existing levels-of-service of the study intersections are summarized in Table 3. Shown in the table are the volume-to-capacity ratios, delays and levels-of-service of the overall intersections.

Table 3 Existing Levels-of-Service

	AM Peak Hour			PM Peak Hour		
Intersection, Approach and Movement	V/C	Delay	LOS	V/C	Delay	LOS
Honoapiilani Highway at Leali'i Parkway	***0.64***	***7.7***	***A***	***0.75***	***11.6***	***B***
Eastbound Left, Thru & Right	0.05	36.5	D	0.03	36.3	D
Westbound Left & Thru	0.56	45.1	D	0.55	42.7	D
Westbound Right	0.00	40.9	D	0.00	45.2	D
Northbound Left	0.21	44.2	D	0.28	52.7	D
Northbound Thru & Right	0.63	5.4	A	0.71	8.9	A
Southbound Left	0.96	155.9	F	0.87	107.6	F
Southbound Thru & right	0.53	4.0	A	0.76	8.6	A
Honoapiilani Highway at Front Street	***0.59***	***9.6***	***A***	***0.74***	***14.4***	***B***
Eastbound Left, Thru & Right	0.66	29.5	C	0.79	32.1	C
Westbound Left, Thru & Right	0.47	23.2	C	0.24	17.9	B
Northbound Left	0.24	35.0	C	0.24	34.0	C
Northbound Thru & Right	0.63	8.8	A	0.80	14.6	B
Southbound Left	0.24	35.0	C	0.24	34.0	C
Southbound Thru	0.57	8.1	A	0.78	14.0	B
Southbound Right	0.16	0.2	A	0.22	0.3	A
Honoapiilani Highway at Kaanapali Parkway	***0.74***	***17.5***	***B***	***1.02***	***46.7***	***D***
Eastbound Left	0.78	33.0	C	1.04	96.6	F
Eastbound Thru	0.03	18.0	B	0.01	28.1	C
Eastbound Right	0.18	9.7	A	0.51	17.5	B
Westbound Left, Thru & Right	0.05	18.1	B	0.04	28.4	C
Northbound Left	0.78	31.2	C	1.04	90.9	F
Northbound Thru	0.52	9.9	A	0.60	18.3	B
Northbound Right	0.01	6.4	a	0.02	11.6	B
Southbound Left	0.59	43.5	D	0.53	56.2	E
Southbound Thru	0.70	17.5	B	0.98	52.0	D
Southbound Right	0.09	11.2	b	0.11	21.0	C

NOTES:
1. V/C denotes ratio of volume to capacity. V/C ratio is not calculated for unsignalized intersections.
2. Delay is in seconds per vehicle.
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay.

H. 2010 Background Traffic Projections

2010 background traffic projections are defined as future background traffic conditions without the proposed project. Future traffic growth consists of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. This growth factor also accounts for smaller development projects in the area for which a traffic impact study is not available or are not identified as a related project during the data collection process. The second component is estimated traffic that will be generated by other development projects (related projects) in the vicinity of the proposed project.

Background Traffic Growth

The *Maui Long Range Transportation Plan*[5] concluded that traffic in Maui would increase an average of 1.6% per year from 1990 to 2020. This growth rate was used to estimate the background growth between 2005 and 2010, the horizon year for this project. 2005 was used as the baseline as the traffic counts were completed in that year. The growth factor was calculated using the following formula:

$$F = (1 + i)^n$$

where F = Growth Factor
i = Average annual growth rate, or 0.016
n = Growth period, or 5 years

This growth factor was applied to all major traffic movements at the study intersections. The background growth assignments are shown in Attachment D.

Related Projects

The second component in estimating background traffic volumes is traffic generated by other proposed projects in the vicinity. Related projects are defined as those projects that are under construction or have been approved for construction and would significantly impact traffic in the study area. Related projects may be development projects or roadway improvements.

The projects that were identified as related projects are listed in Table 4.

Table 4 Related Project and Sources of Traffic Assignments

Project	Source of Traffic Assignments
Lanikeha	TIAR for Lanikeha
The Pinnacle	TIAR for Lanikeha
The Summitt	TIAR for Lanikeha
Pulelehua	TIAR for Pulelehua
Maui Preparatory Academy	TIAR for Pulelehua
Kapalua Mauka	TIAR for Pulelehua
Kaanapali 2020	TIAR for Pulelehua
Kaanapali Coffee Farms	TIAR for Pulelehua
Honokowai DHHL	Trip Generation Estimate
Kaanapali Residences (LandTech)	See Note (1)
Starwood	See Note (1)
Intrawest Honua Kai	See Note (1)
Kaanapali Ocean Resort Westin	See Note (1)
Kahana Ridge Villas	See Note (1)
Napilihau Mauka	Draft TIAR for Project
Marriott Ocean Club	TIAR for Marriott Ocean Club
DHHL Subdivision	See Note (1)
Villages at Leali'i	See Note (1)
Hyatt Regency Timeshares	Traffic Impact Assessment Report for Hyatt

Notes:
(1) The number of trips was estimated using the project description and Institute of Transportation Engineers trip generation data and distributed along the adjacent roadway network.

[5] Kaku Associates, *Maui Long-Range Land Transportation Plan*, October 1996

Traffic assignments for the projects shown were obtained from their respective traffic studies or the number of trips that the project will generate was estimated, distributed and assigned to the study intersections. The total trip assignments for the related projects are shown on Attachment E. The 2010 background traffic projections are shown in Attachment F.

I. Project Trip Generation

Future traffic volumes generated by the project were estimated using the procedures described in the *Trip Generation Handbook*[6] and data provided in *Trip Generation*[7]. This method used trip generation rates to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent streets.

The assumptions used for the trip generation analysis are:

1. The proposed project will consist of 4 tennis courts.

2. Trip Generation provides trip generation data for tennis courts. The data is based on the number of courts.

The trip generation calculations are summarized in Table 5. As shown the proposed project will generate 4 inbound and 3 outbound trips during the morning peak hour. During the afternoon peak hour, the project will generate 8 inbound and 8 outbound trips.

The project generated traffic was distributed and assigned based on the existing approach and departure pattern of traffic at the study intersections. The project trip assignments are shown in Attachment G.

Table 5 Trip Generation Calculations for Proposed Project

		49 Single-Family units		
Time Period	Direction	Rate or %(1)	Units	Trips
AM Peak Hour	Total	1.67	4	7
	In	50%		4
	Out	50%		3
PM Peak Hour	Total	3.88		16
	In	50%		8
	Out	50%		8

NOTES:
(1) Institute of Transportation Engineers, *Trip Generation*, Seventh Edition, 2003.

J. 2010 Background Plus Project Projections

2010 background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the 2010 background (without project) peak hour traffic projections. This assumes that the peak hourly trips generated by the project coincide with the peak hour of the adjacent street. This represents a worse-case condition as it assume that the peak hours of all the intersection approaches, the peak hours of all the related projects and the peak hour of the study project coincide and the all the related projects and the study project are 100% occupied. The resulting 2010 background plus project peak hour traffic projections are shown in Attachment H.

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[6] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998, p. 7-12

[7] Institute of Transportation Engineers, *Trip Generation*, 7th Edition, Washington, D.C., 2003

K. Impact Analysis of 2010 Conditions Impact Analysis of 2010 Conditions

Based on criteria recommended by the Institute of Transportation Engineers, a traffic impact study is not warranted because the project will generate only 8 outbound trips per hour during the afternoon peak hour, which is less than the 100 trips per hour required to warrant a traffic impact analysis. However, an analysis of the changes in peak hourly traffic at the study intersections and a level-of-service was performed to identify operational deficiencies adjacent to the project for 2010 background plus project conditions.

Analysis of Project's Share of Total Intersection Approach Volumes

An analysis of the project's share of 2010 background plus project intersection approach volumes at the study intersections is summarized in Table 6. The table summarizes the project's share of total 2010 peak hour approach volumes at each study intersection. Also shown are the percentage of 2010 background plus project traffic that is the result of background growth and traffic generated by related projects. The conclusion of this analysis is that project generated traffic will represent 0.3%, or less, of the total traffic at the study intersections.

Table 6 Analysis of Project's Share of Total Intersection Approach Volumes (1)

Intersection	Period	Existing	2010 Background	2010 Background Plus Project	Background Growth		Project Traffic	
					Trips	Percent of Total Traffic (2)	Trips	Percent of Total Traffic (3)
Honoapiilani Hwy at Lealiʻi Pkwy	AM	3025	4100	4107	1075	26.2%	7	0.2%
	PM	3730	5040	5056	1310	25.9%	16	0.3%
Honoapiilani Hwy at Front Street	AM	2865	3870	3874	1005	25.9%	4	0.1%
	PM	3420	4585	4593	1165	25.4%	8	0.2%
Honoapiilani Hwy at Kaanapali Pkwy	AM	2925	3795	3798	870	22.9%	3	0.1%
	PM	4325	5415	5423	1090	20.1%	8	0.1%

Notes:
(1) Volumes shown are total intersection approach volumes or projections.
(2) Percentage of total 2010 background plus project traffic.

Analysis of Project's Pro Rata Share of Intersection Traffic Growth

An analysis of the project's pro rata share of the increase of traffic volumes between 2005 and 2010 summarized in Table 7. This table summarizes the growth between 2005 and 2010 and indicates the percentage of growth resulting from background growth and related projects and the percentage growth resulting from project generated traffic. The conclusion of this analysis is that the changes in traffic volumes as a result of project generated traffic are 1.2%, or less, which are significantly less than the changes as a result of background traffic growth, which are greater than 98%.

Table 7 Analysis of Project's Share of Total Intersection Approach Volumes Growth (1)

Intersection	Period	Existing	2010 Background	Background Plus Project	Background Growth (2)		Project Trips (3)	
					Volume	% of 2005 to 2010 Growth	Volume (4)	% of 2005 to 2010 Growth
Honoapiilani Hwy at Lealiʻi Pkwy	AM	3025	4100	4107	1075	99.4%	7	0.6%
	PM	3730	5040	5056	1310	98.8%	16	1.2%
Honoapiilani Hwy at Front Street	AM	2865	3870	3874	1005	99.6%	4	0.4%
	PM	3420	4585	4593	1165	99.3%	8	0.7%
Honoapiilani Hwy at Kaanapali Pkwy	AM	2925	3795	3798	870	99.7%	3	0.3%
	PM	4325	5415	5423	1090	99.3%	8	0.7%

Notes:
(1) Volumes shown are total intersection approach volumes or projections.
(2) Background versus existing.
(3) Background plus project versus background.
(4) Project generated traffic.

Level-of-Service Analysis

The results of the level-of-service analysis for existing and 2010 conditions are summarized in Attachment I. Shown in the table are the volume-to-capacity ratios, average vehicle delays and the levels-of-service of the controlled movements.

1. The Synchro software package was used to performed level-of-service analyses. Synchro uses the *Highway Capacity Manual* methodology.

2. We have used the Institute of Transportation Engineers standard that a Level-of-Service D is the minimum acceptable level-of-service and that the criteria is applicable to the overall intersection. If project generated traffic causes the level-of-service to drop below Level-of-Service D, then mitigation should be provided to improve the level-of-service to Level-of-Service C or better. Minor movements, such a left turns and side street approaches may operate at Level-of-Service E for short periods. "Level-of-Service E is sometimes tolerated for minor movements such as left turns when there are no feasible mitigating measures or if it helps maintain the main through movements at acceptable levels-of-service."

3. As the *Highway Capacity Manual* defines level-of-service by delay, we have used the same definitions.

4. The level-of-service analysis used the existing traffic signal cycle lengths and phasing.

The results of the Level-of-Service analysis are

1. The intersection of Honoapiilani Highway will operate at Level-of-Service C during the morning peak hour and Level-of-Service D during the afternoon peak hour.

    - The westbound left and through movement will operate at Level-of-Service F, without and with the project. The delay indicates Level-of-Service F but the volume-to-capacity ratio indicates Level-of-Service D during the morning peak hour and Level-of-Service E during the afternoon peak hour.

    - The northbound left turn will operate at Level-of-Service F, without and with the project, based on the average vehicle delay. The volume-to-capacity ratio indicates Level-of-Service A or B. The long delay and therefore the low level-of-service is the result of the long traffic signal cycle rather than a lane deficiency. The project adds no traffic to this movement.

    - The southbound left turn will operate at Level-of-Service F during the morning and afternoon peak hour, without and with the project. The volume-to-capacity ratio indicates Level-of-Service D during the morning peak hour and Level-of-Service F during the afternoon peak hour.

    - There is no change in the Level-of-Service of any movement as the result of project generated traffic.

2. The intersection of Honoapiilani Highway at Front Street will operate at Level-of-Service B during the morning peak hour and Level-of-Service C during the afternoon peak hour.

    - There is no change in the Level-of-Service of any movement as the result of project generated traffic.

    - During the morning peak hour, the eastbound approach, and northbound left and the southbound left will operate at Level-of-Service E, without and with the project. The volume-to-capacity ratios indicate at all movements will operate at Level-of-Service C, or better.

- During the afternoon peak hour, the eastbound approach, and northbound left and the southbound left will operate at Level-of-Service E or F, without and with the project. The volume-to-capacity ratios indicate at all movements will operate at Level-of-Service D, or better.

3. The intersection of Honoapiilani Highway at Kaanapali Parkway will operate at Level-of-Service C during the morning peak hour and Level-of-Service F during the afternoon peak hour.

   - During the morning peak hour, the eastbound approach, the northbound left and the southbound left will operate at Level-of-Service E or F, without and with project generated traffic. The volume-to-capacity ratios all indicate Level-of-Service D, or better. This implies that the long delays are the result of the long traffic signal cycle. It should also be noted that there is no change in the volume-to-capacity ratio or delay as a result of project generated traffic because the number of project generated trips through this intersection is so small.

   - During the afternoon peak hour, the eastbound left turn, the westbound approach, the northbound left turn, the southbound left turn and the southbound through movements will operate at Level-of-Service E or F, without and with project generated traffic. All the volume-to-capacity ratios change 0.01, or less, which implies that the volume-to-capacity ratios will change less than 1% as a result of project generated traffic.

   - There is no change in the Level-of-Service of any movement as the result of project generated traffic. The maximum number of trips added to any movement us two (2) trips per hour.

L. Mitigation

Level-of-Service D is generally considered to be the minimum acceptable peak hour level-of-service for urban intersections.[8] Side street approaches and minor movements, such as left turn lanes may operate at Level-of-Service E or F for short periods, especially of the volume-to-capacity ratio indicates a higher Level-of-Service as this implies that the long delay and therefore the low Level-of-Service is a result of the traffic signal cycle length rather than a lane deficiency.

Several movements at the study intersections operate at levels-of-service below Level-of-Service D. However, in all the cases the long delays and low levels-of-service are the result of background traffic rather than traffic generated by the study project. There are no changes in the level-of-service of any traffic movement as a result of project generated traffic. The largest change in the volume-to-capacity ratio of any movement is 0.02, which is the westbound approach of Leali'i Parkway at Honoapiilani Highway

M. Other Traffic Issues

Regional Traffic Impacts

As the users of the project will come from the West Maui area. Therefore, it is reasonable to assume that the traffic impacts will be limited to the West Maui are.

Honoapiilani is a major State highway and the majority of the traffic to and from the project will use this highway, it is reasonable to assume that project generated traffic will have an impact beyond the immediate vicinity of the project. The further away one is from the project, the less the impact since traffic will dissipate over distance. Since the impact in the immediate vicinity of the project is minimal, it is reasonable to assume that the traffic impacts of the project will also be dissipate at locations more distant from the project.

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[8] Institute of Traffic Engineers *Transportation Impact Analyses for Site Development, A Recommended Practice,* Washington, D.C., 2006, p 60.

N. Summary and Conclusions

The conclusions of the traffic impact assessment are:

1. The proposed project will generate 4 inbound and 3 outbound trips during the morning peak hour. During the afternoon peak hour, the project will generate 8 inbound and 8 outbound trips.

2. The Institute of Transportation Engineers recommends that a traffic impact study should be performed if, in lieu of another locally preferred criterion, development generates an additional 100 vehicle trips in the peak direction (inbound or outbound) during the site's peak hour. Based on the criterion, a traffic impact analysis is not warranted.

3. An analysis of the anticipated traffic volumes at the study intersections along Honoapiilani Highway concluded:

    a. Traffic volumes will increase 0.3% or less as a result of project generated traffic during the peak hours. This compares to increases of 99.0% or more as a result of background growth and related projects' traffic.

    b. Project generated traffic will represent 1.2% or less of the total growth in traffic at the intersection of Honoapiilani Highway at Leali'i Parkway between 2005 and 2010. The growth at the remaining intersections as a result of project generate traffic will be significantly less.

4. The level-of-service analysis for background plus project conditions concluded the following:

    a. The intersection of Honoapiilani Highway at Leali'i Parkway will operate t Level-of-Service C during the morning peak hour and Level-of-Service D during the afternoon peak hour, without and with project generated traffic. There is no change of level-of-service of any movement as a result of project generate traffic.

    b. The intersection of Honoapiilani Highway at Front Street will operate at Level-of-Service B during the morning peak hour and Level-of-Service D during the afternoon peak hour, without and with project generated traffic. There is no change of level-of-service of any movement as a result of project generate traffic.

    c. The intersection of Honoapiilani Highway at Kaanapali Parkway will operate at Level-of-Service C during the morning peak hour and Level-of-Service F during the afternoon peak hour, without and with project generated traffic. There is no change of level-of-service of any movement as a result of project generate traffic.

Respectfully submitted,
PHILLIP ROWELL AND ASSOCIATES

Phillip J. Rowell, P.E.
Principal

List of Attachments

A. Schematic Site Plan

B. Existing Lane Configurations and Right-of-Way Controls

C. Existing Peak Hour Traffic Volumes

D. Background Traffic Growth (2005 to 2010)

E. Related Projects' Trip Assignments

F. 2010 Background Peak Hour Traffic Projections

G. Project Trip Assignments

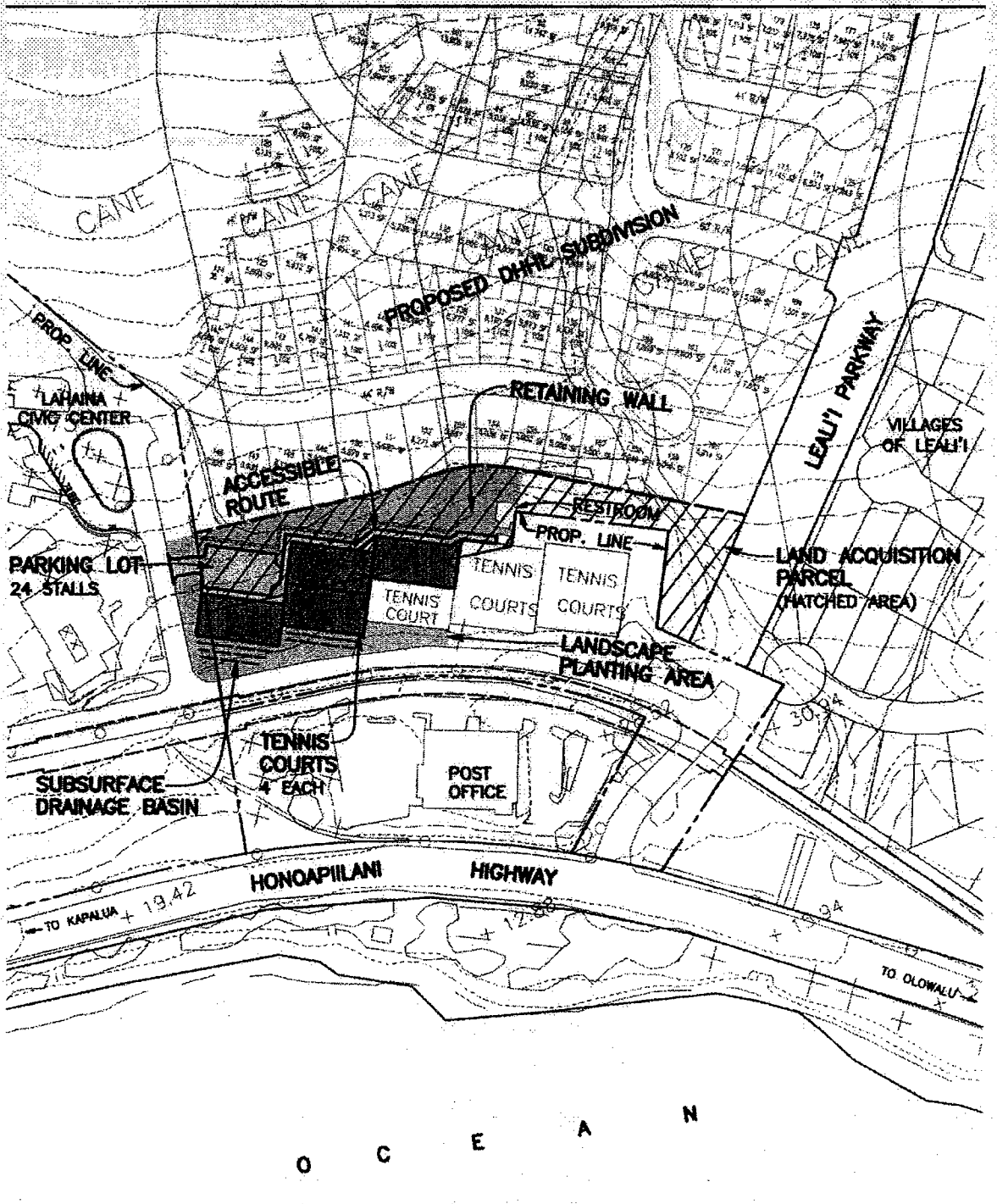
H. 2010 Background Plus Project Peak Hour Traffic Projections

I. Results of Level-of-Service Analysis (Background and Background Plus Project)

Attachment A

SCHEMATIC SITE PLAN

(Source: Ronald M. Fukumoto Engineering,Inc.)



LAHAINA CIVIC CENTER TENNIS COURTS - CONCEPTUAL PLAN

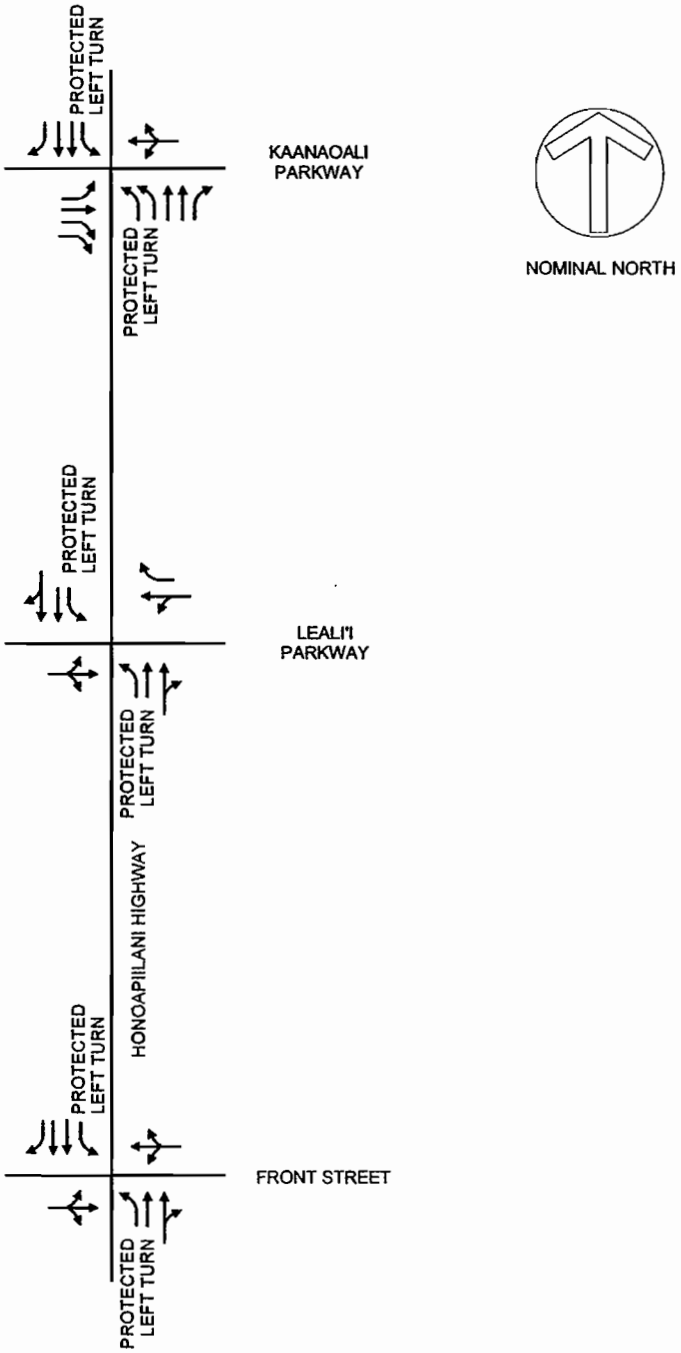
SCALE IN FEET

NORTH 0 100 200 400 600

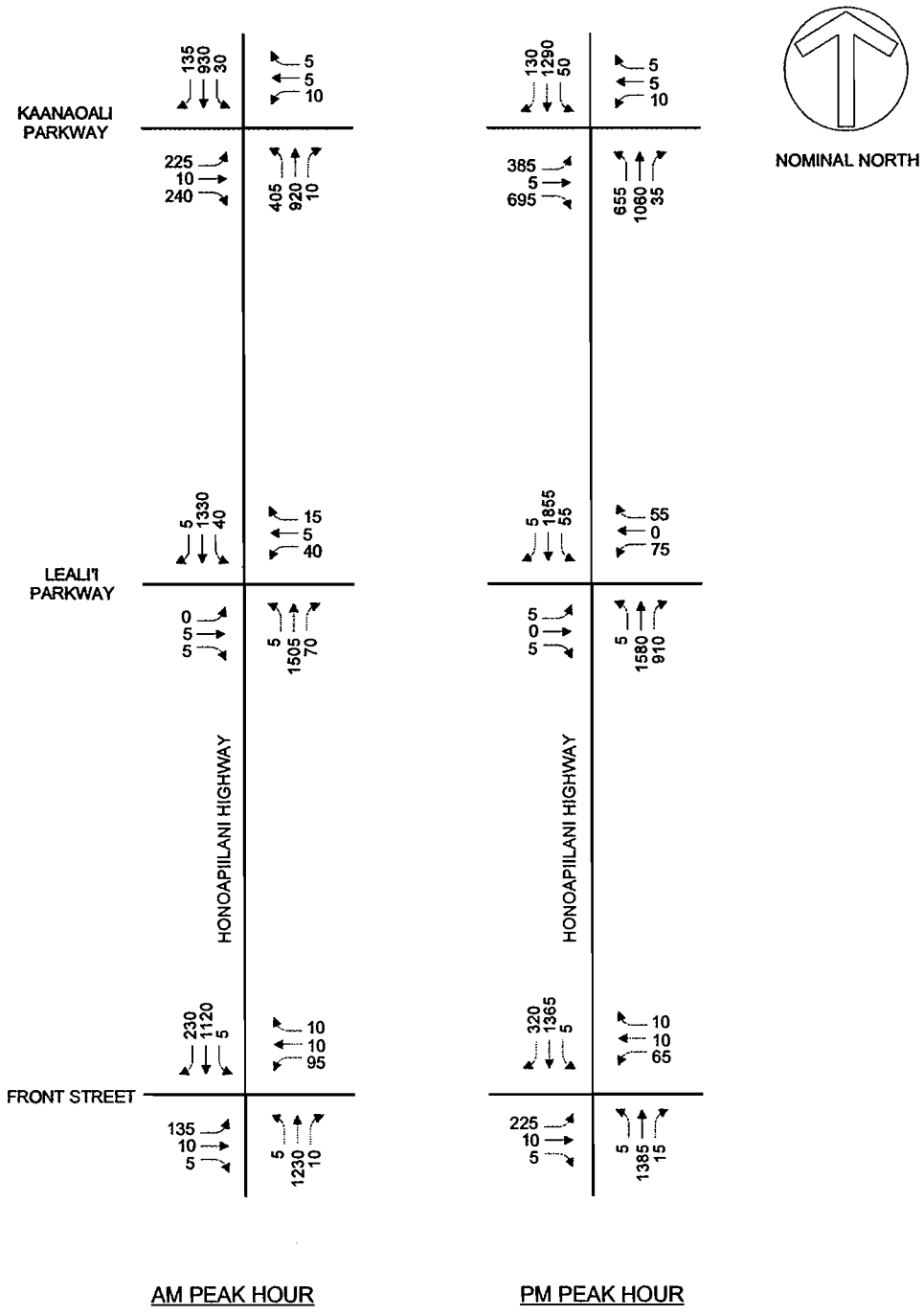
9/20/06
REVISED: 10/02/06

PREPARED FOR: DEPARTMENT OF PARKS & RECREATION

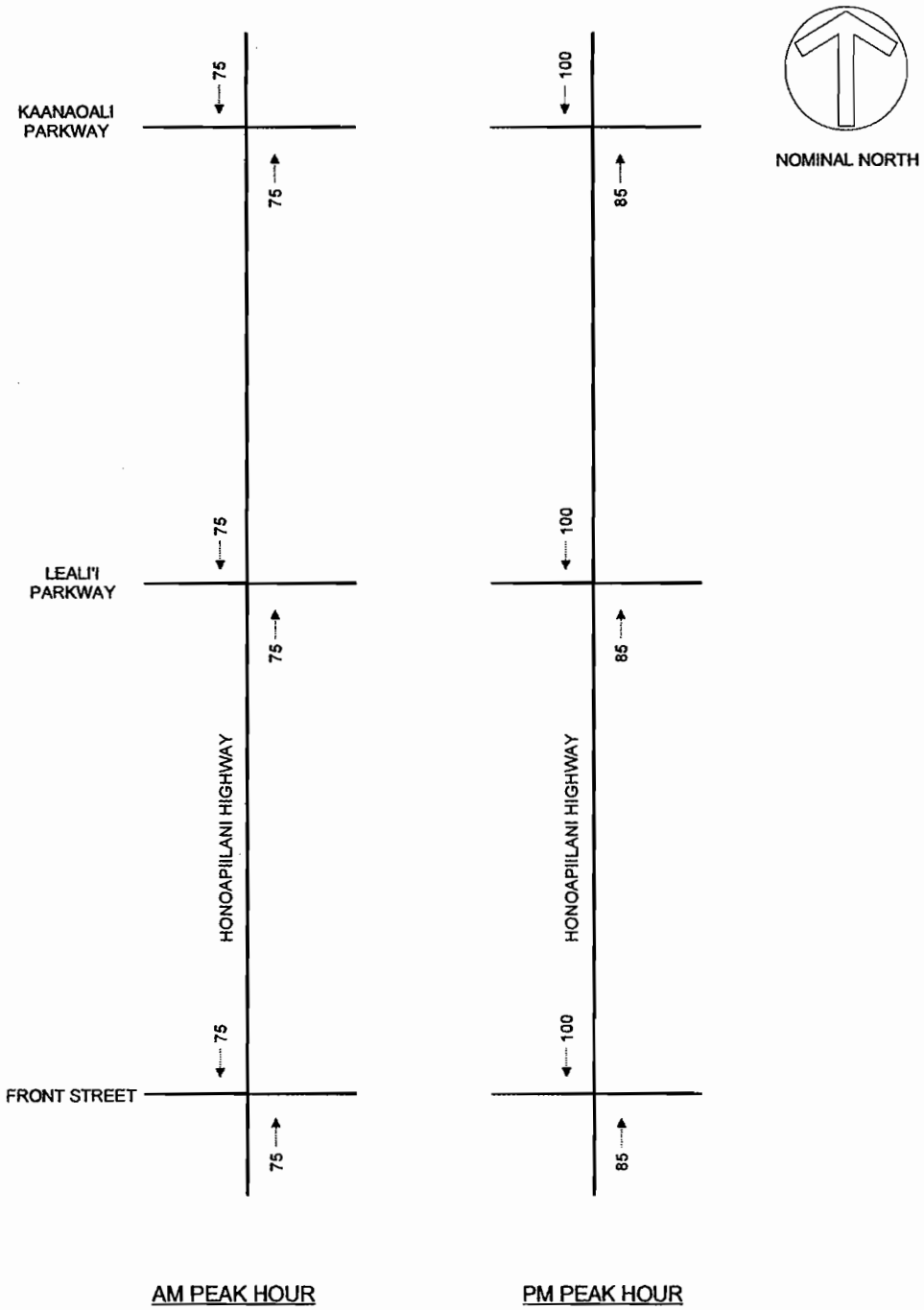
PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



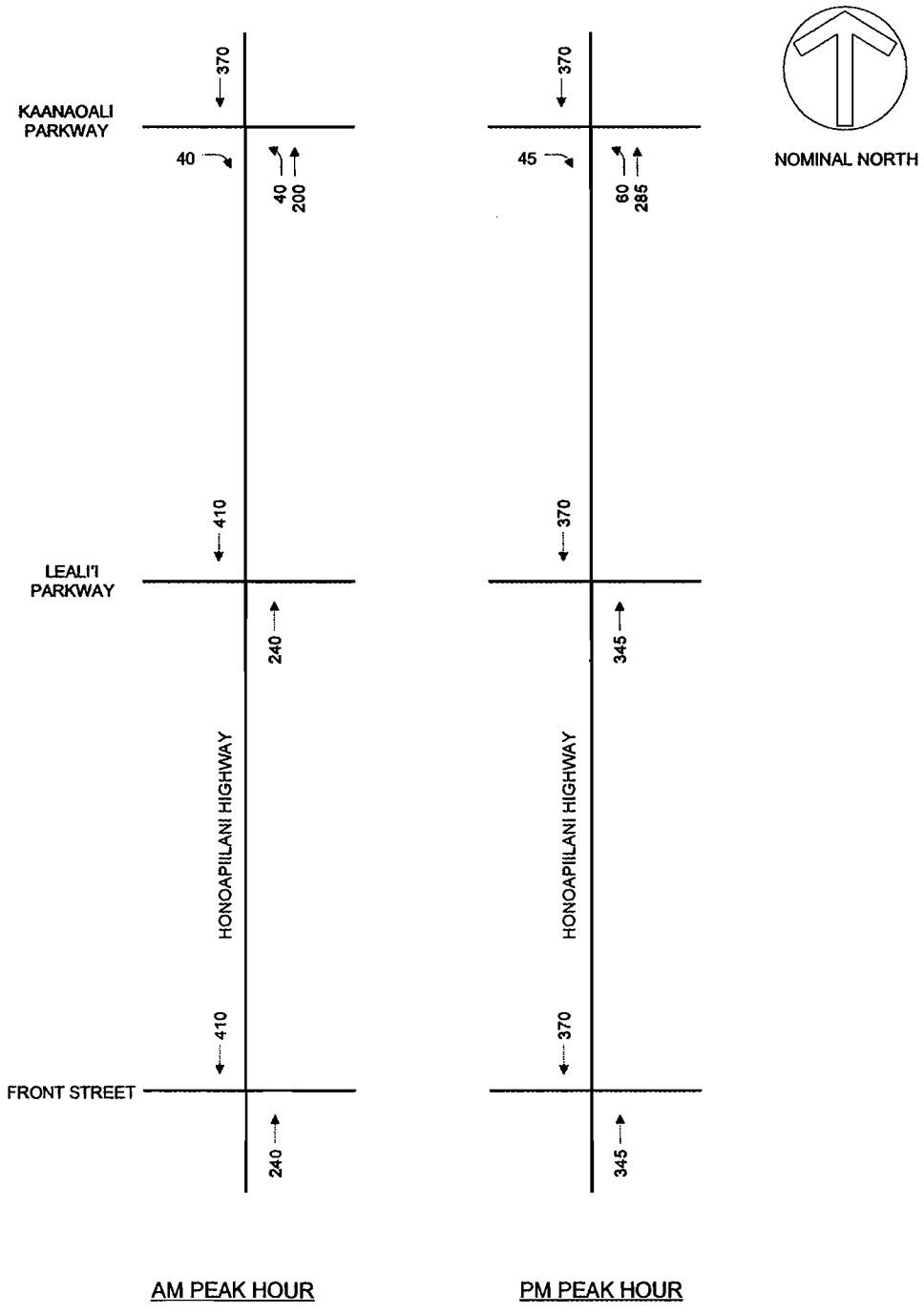
Attachment B
EXISTING LANE CONGIFURATIONS AND RIGHT-OF-WAY CONTROLS



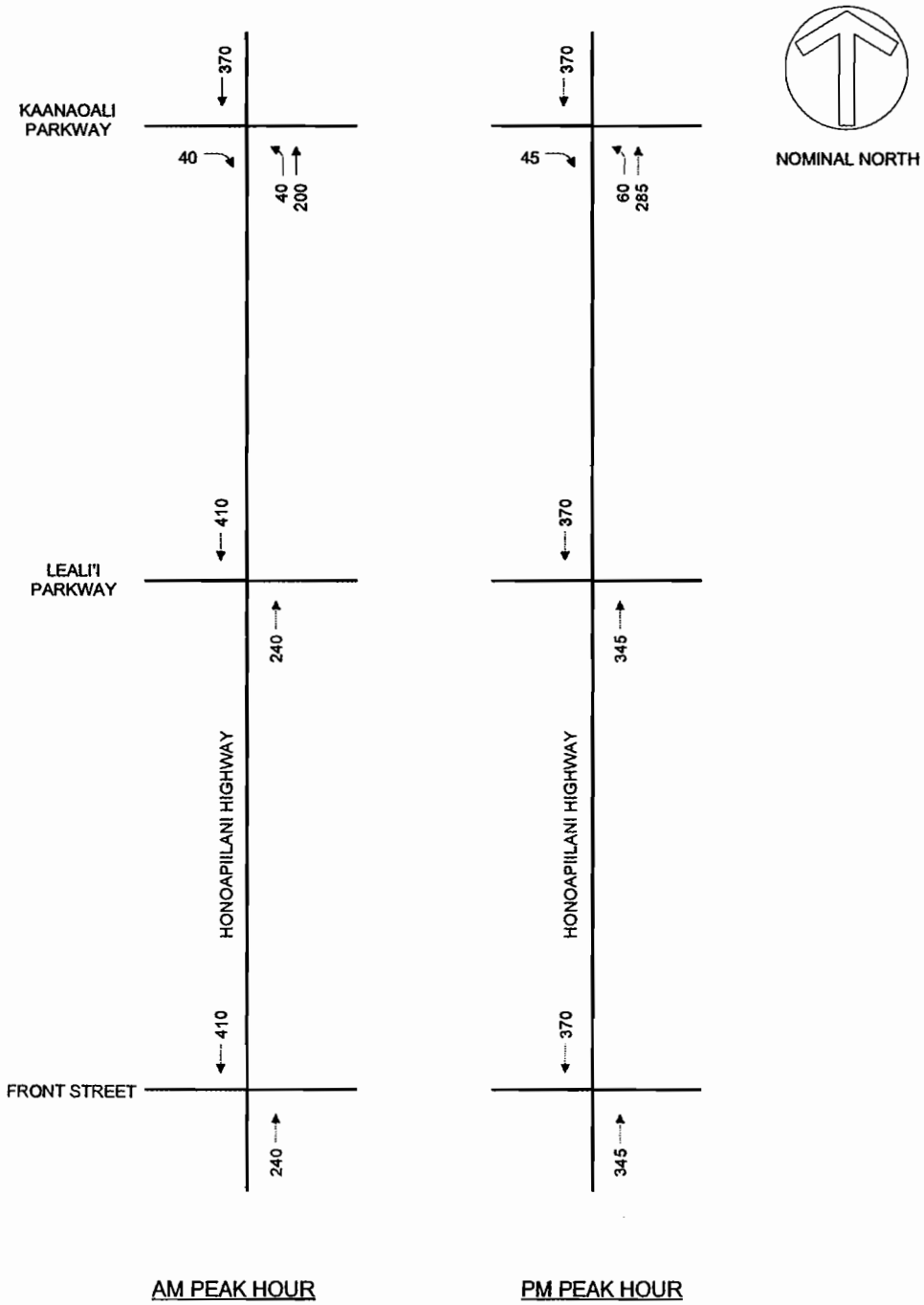
Attachment C
EXISTING PEAK HOUR TRAFFIC VOLUMES



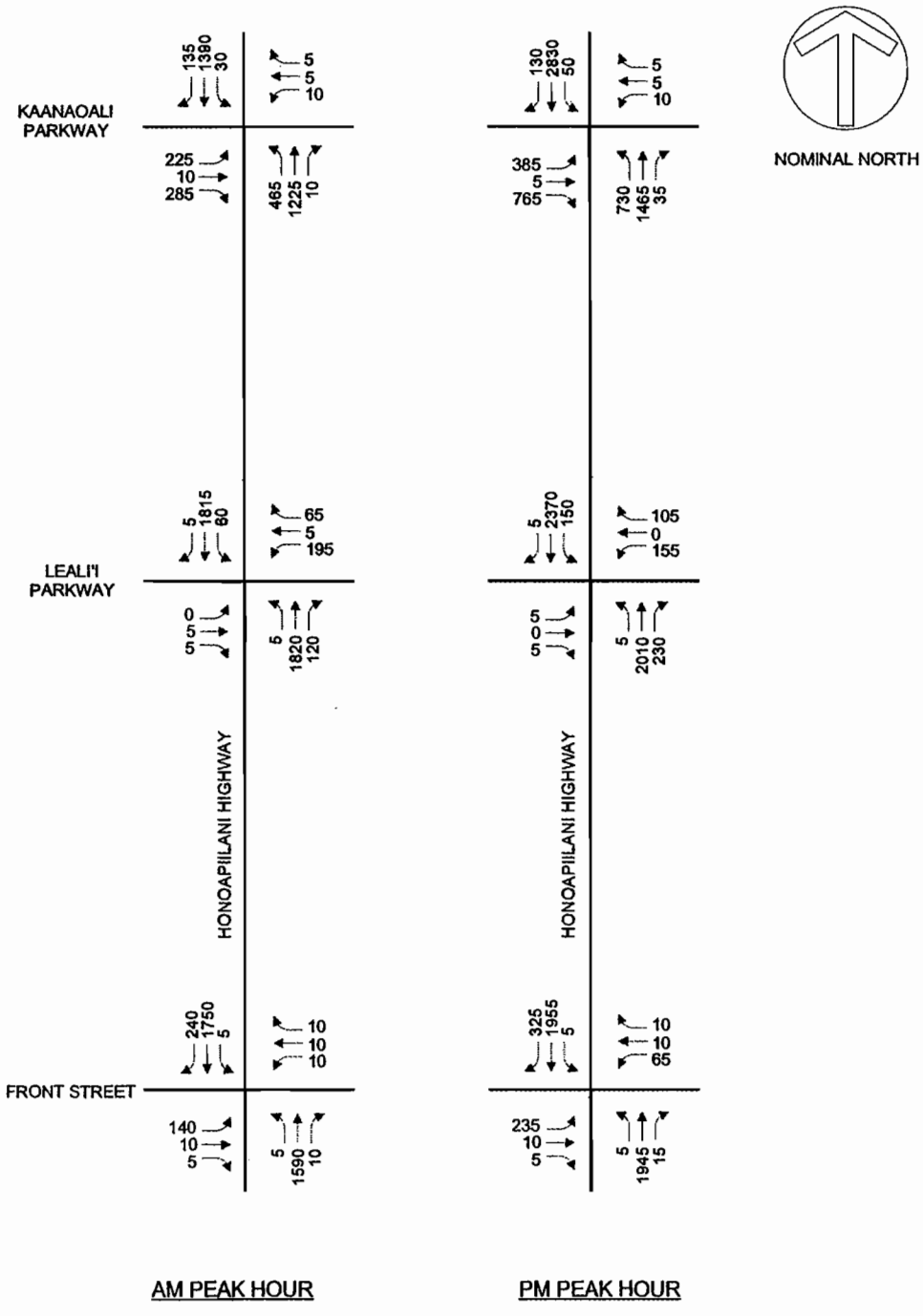
Attachment D
BACKGROUND TRAFFIC GROWTH (2005 TO 2010)



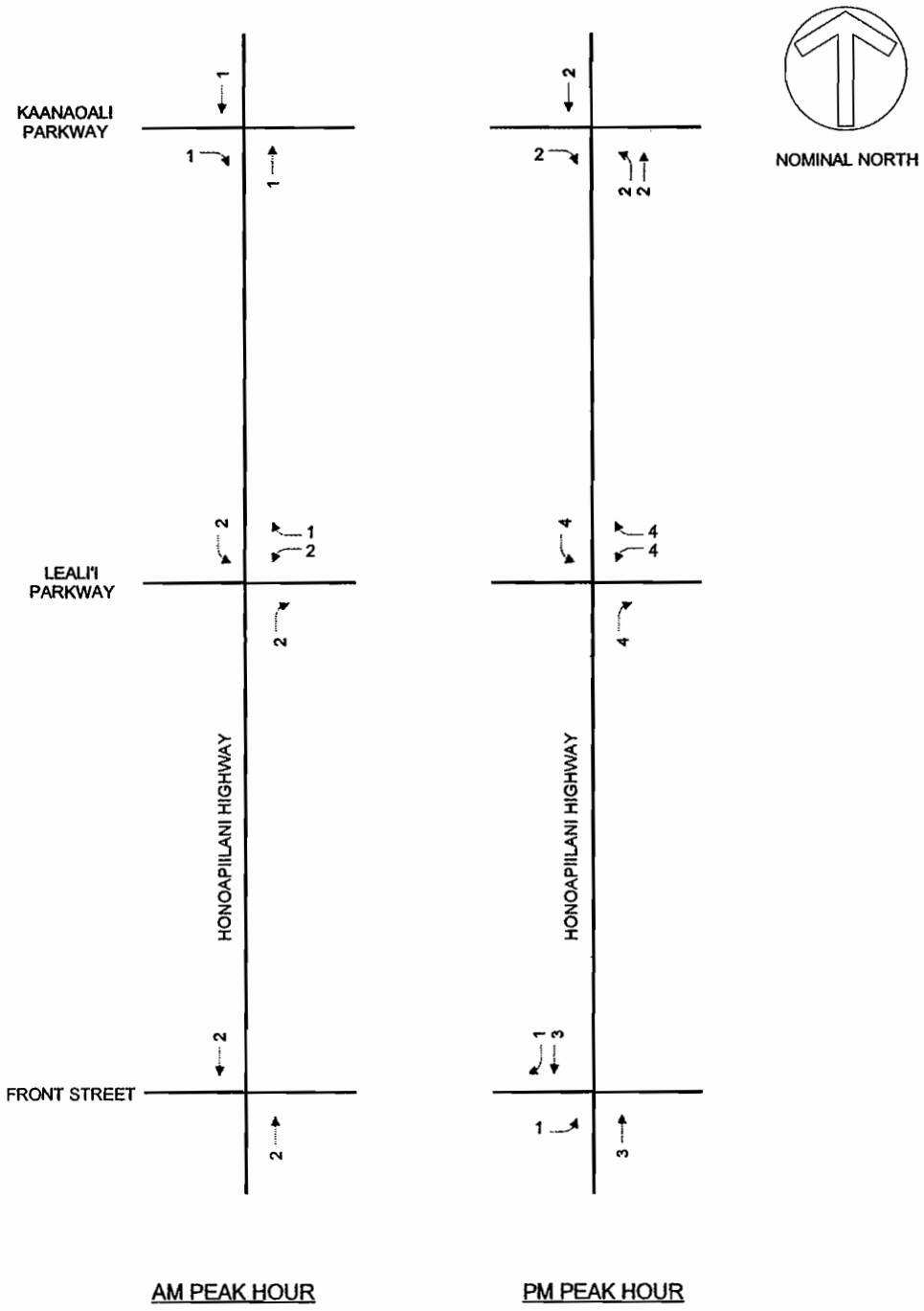
Attachment D
BACKGROUND TRAFFIC GROWTH (2005 TO 2010)



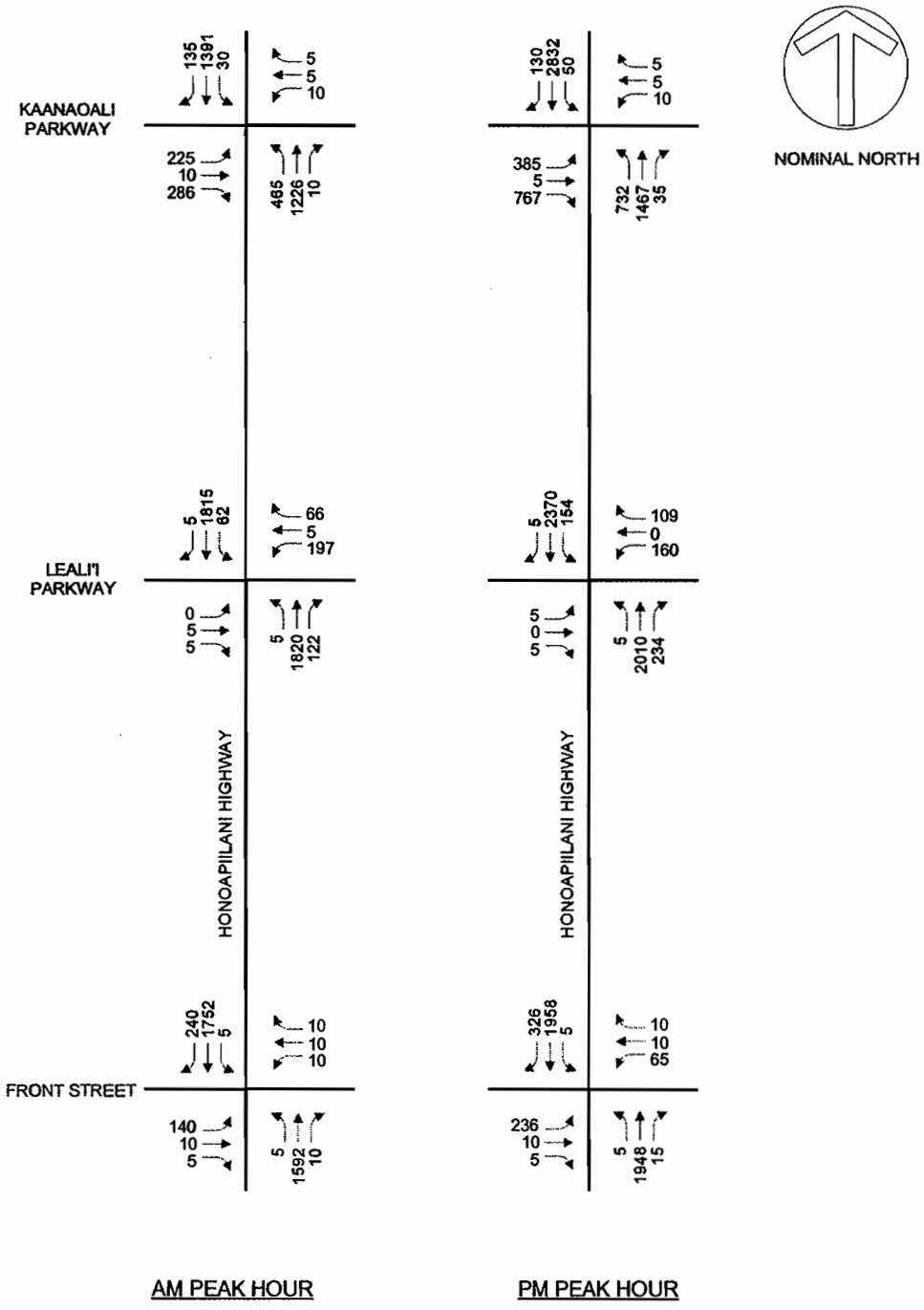
Attachment E
RELATED PROJECTS' TRIP ASSIGNMENTS



Attachment F
2010 BACKGROUND PEAK HOUR TRAFFIC PROJECTIONS



Attachment G
PROJECT TRIP ASSIGNMENTS



Attachment H
2010 BACKGROUND PLUS PROJECT PEAK HOUR TRAFFIC PROJECTIONS

Attachment I 2010 Levels-of-Sevice

Roadway, Approach and Movement	AM Peak Hour								PM Peak Hour							
	Background			Background Plus Project			Changes		Background			Background Plus Project			Changes	
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay
Honoapiilani Highway at Leali'i Parkway	0.87	23.1	C	0.88	23.4	C	0.01	0.3	1.00	37.2	D	1.01	38.5	D	0.01	1.3
Eastbound Left, Thru & Right	0.02	46.9	D	0.02	46.9	D	0.00	0.0	0.03	52.4	D	0.03	52.3	D	0.00	-0.1
Westbound Left & Thru	0.90	88.5	F	0.91	89.9	F	0.01	1.4	0.91	101.6	F	0.93	105.7	F	0.02	4.1
Westbound Right	0.07	47.4	D	0.07	47.4	D	0.00	0.0	0.09	53.0	D	0.11	53.1	D	0.02	0.1
Northbound Left	0.50	103.0	F	0.50	103.1	F	0.00	0.1	0.50	103.3	F	0.50	103.1	F	0.00	-0.2
Northbound Thru & Right	0.87	21.2	C	0.87	21.4	C	0.00	0.2	1.01	43.3	D	1.02	44.7	D	0.01	1.4
Southbound Left	0.82	112.9	F	0.85	118.9	F	0.03	6.0	0.98	126.7	F	1.01	134.3	F	0.03	7.6
Southbound Thru & right	0.77	13.8	B	0.77	13.8	B	0.00	0.0	0.94	20.8	C	0.94	21.2	C	0.00	0.4
Honoapiilani Highway at Front Street	0.71	13.7	B	0.71	13.7	B	0.00	0.0	0.90	26.0	C	0.90	26.3	C	0.00	0.3
Eastbound Left, Thru & Right	0.76	64.6	E	0.76	64.6	E	0.00	0.0	0.90	76.1	E	0.90	76.0	E	0.00	-0.1
Westbound Left, Thru & Right	0.51	50.3	D	0.51	50.3	D	0.00	0.0	0.26	40.3	D	0.26	40.2	D	0.00	-0.1
Northbound Left	0.33	75.3	E	0.33	75.3	E	0.00	0.0	0.50	97.5	F	0.50	97.6	F	0.00	0.1
Northbound Thru & Right	0.67	10.2	B	0.67	10.2	B	0.00	0.0	0.90	23.8	C	0.90	24.2	C	0.00	0.4
Southbound Left	0.33	75.3	E	0.33	75.3	E	0.00	0.0	0.50	97.5	F	0.50	97.6	F	0.00	0.1
Southbound Thru	0.73	11.5	B	0.73	11.5	B	0.00	0.0	0.90	23.6	C	0.90	23.9	C	0.00	0.3
Southbound Right	0.16	0.2	A	0.16	0.2	A	0.00	0.0	0.26	9.1	A	0.26	9.1	A	0.00	0.0
Honoapiilani Highway at Kaanapali Parkway	0.83	30.5	C	0.83	30.5	C	0.00	0.0	1.18	100.5	F	1.18	101.0	F	0.00	0.5
Eastbound Left	0.88	76.9	E	0.88	76.9	E	0.00	0.0	1.20	168.5	F	1.20	168.5	F	0.00	0.0
Eastbound Thru	0.03	42.8	D	0.03	42.8	D	0.00	0.0	0.01	35.9	D	0.01	35.9	D	0.00	0.0
Eastbound Right	0.26	26.4	C	0.26	26.4	C	0.00	0.0	0.62	27.0	C	0.62	27.0	C	0.00	0.0
Westbound Left, Thru & Right	0.05	43.0	D	0.05	43.0	D	0.00	0.0	0.21	63.7	E	0.21	63.7	E	0.00	0.0
Northbound Left	0.84	63.6	E	0.84	63.6	E	0.00	0.0	1.31	208.8	F	1.32	210.9	F	0.01	2.1
Northbound Thru	0.55	11.7	B	0.55	11.7	B	0.00	0.0	0.76	23.0	C	0.76	23.1	C	0.00	0.1
Northbound Right	0.01	6.8	A	0.01	6.8	A	0.00	0.0	0.03	11.5	B	0.03	11.5	B	0.00	0.0
Southbound Left	0.73	110.8	F	0.73	110.8	F	0.00	0.0	0.76	102.4	F	0.76	102.4	F	0.00	0.0
Southbound Thru	0.80	29.0	C	0.80	29.0	C	0.00	0.0	1.22	143.6	F	1.23	144.1	F	0.01	0.5
Southbound Right	0.12	15.8	B	0.12	15.8	B	0.00	0.0	0.14	21.9	C	0.14	21.9	C	0.00	0.0

NOTES:

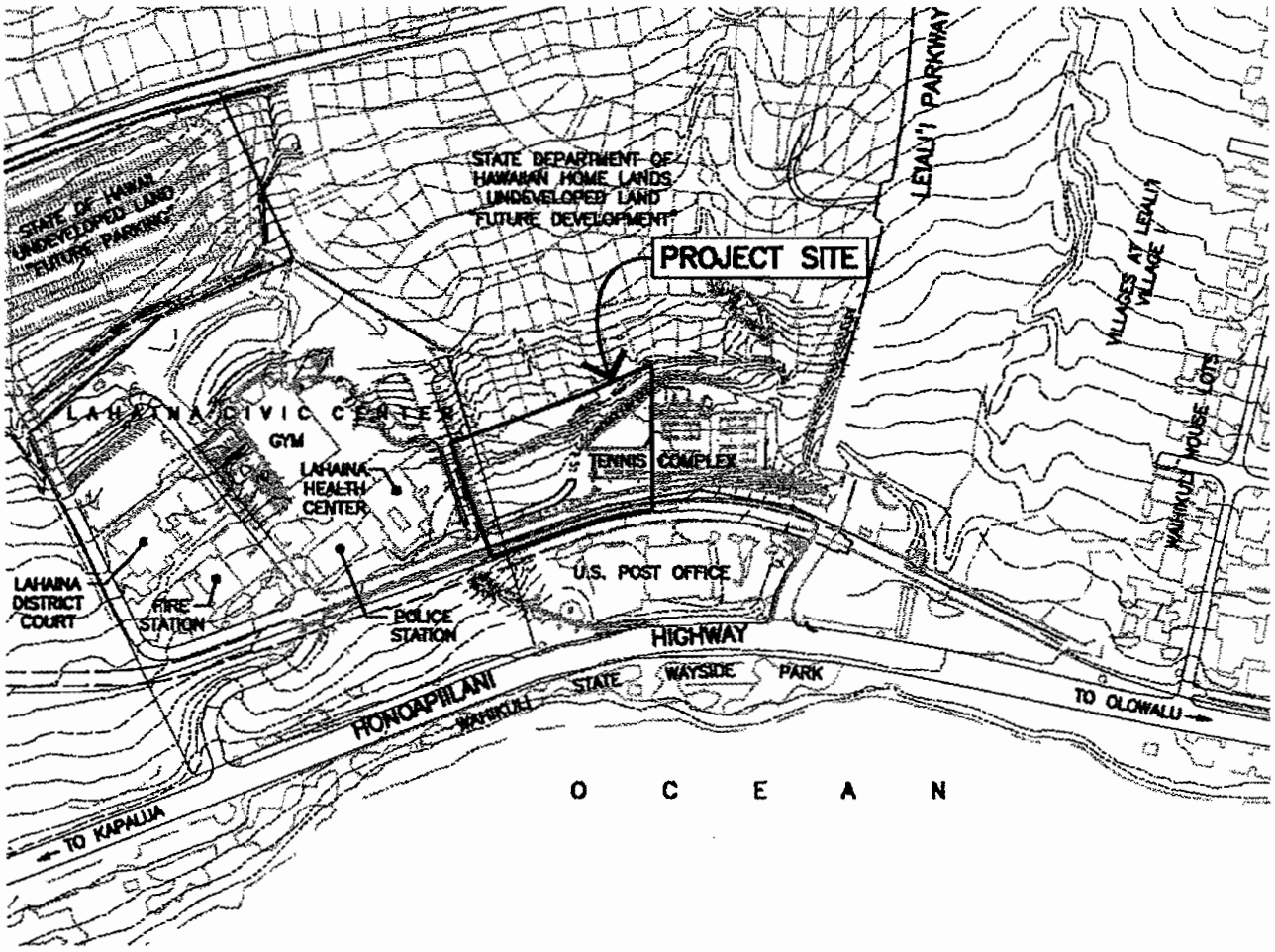
1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the project.
2. V/C denotes ratio of volume to capacity. V/C ratio is not calculated for unsignalized intersections.
3. Delay is in seconds per vehicle.
4. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay.

APPENDIX E.

Preliminary Engineering Report

PRELIMINARY ENGINEERING REPORT
For Lahaina Civic Center Tennis Courts

Lahaina, Maui, Hawaii
Tax Map Key (2) 4-5-021:010, 016 and 020



Project:

Lahaina Civic Center Tennis Courts
Lahaina, Maui, Hawaii

Date:

June 6, 2008

Client:

Department of Parks & Recreation
County of Maui
700 Hali'a Nakoa Street, Unit 2
Wailuku, Hawaii 96793

Consultant:

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TABLE OF CONTENTS

I. PURPOSE

The purpose of this report is to evaluate the effects of the project on existing infrastructure. This report will review the water system, wastewater system, and electrical, telephone, and cable television systems serving the project. This report will also provide an analysis of existing and proposed drainage systems. The drainage analysis will describe existing drainage conditions, present preliminary grading and drainage plans, and provide drainage design information for incorporation into the final designs.

II. PROJECT DESCRIPTION

A. General Location

The project involves an expansion of the tennis complex at the Lahaina Civic Center (LCC). The LCC lies on two State-owned parcels on the mauka side of Honoapiilani Highway. Various State and County offices, including the Lahaina Health Center, Lahaina Police Station, Lahaina Fire Station, Lahaina District Court, and the gymnasium, are located on the larger 16.782-acre parcel (Tax Map Key: (2) 4-5-021:016). The existing tennis complex lies on the smaller 3.849-acre parcel (Tax Map Key: (2) 4-5-021:010).

The proposed site encompasses an area of about 2.0 acres and affect portions of three parcels. The site affects a 0.2-acre portion of the larger LCC parcel, a 0.7-acre portion of the smaller LCC parcel, and a 1.1-acre portion of the adjoining undeveloped land owned by the State of Hawaii Department of Hawaiian Home Lands (DHHL). The County is seeking an agreement to use a 1.859-acre portion of the DHHL parcel for the project. The DHHL parcel includes a total area of 50.858 acres and is designated on the tax maps as Tax Map Key (2) 4-5-021:020. (See Figure 1 – Location Map (USGS Map), page 9; Figure 2 – Vicinity Map (Tax Map), page 10; and Figure 5 – Regional Topographic Map, page 13.)

The undeveloped DHHL land adjoins the easterly side of the site, the Villages at Leialii - Village I adjoins the southerly side of the site, the Lahaina Post Office adjoins the westerly side of the site, and the larger LCC parcel adjoins the northerly side of the site. Other developed properties in the vicinity include the Wahikuli House Lots subdivision to the South of the Villages at Leialii - Village I and Wahikuli Wayside Park to the East of the site on the makai side of Honoapiilani Highway. Undeveloped State-owned property lies to the North and East of the larger LCC parcel.

B. Project Components

The expansion of the tennis complex consists of four tennis courts with sports lighting, fencing, and windscreens; a 25-stall paved parking lot with lighting; accessible walkways with lighting; retaining walls; landscape plantings and irrigation, and site utilities.

Site utilities include water, wastewater, drainage, and electrical systems. Water system

improvements consist of relocation of a water meter manhole, relocation of a fire hydrant, water service lines, and drinking fountains. Wastewater system improvements include a sewer lateral for the existing tennis court restroom and the closure of its existing cesspool. Drainage system improvements consist of channels, inlets, manholes, drain pipe, and a subsurface detention/retention basin. Electrical system improvements include underground distribution lines for the lighting.

III. WATER SYSTEM

The County of Maui provides water service for the LCC. The existing distribution system within the civic center site includes 8-inch lines and fire hydrants. Existing water laterals tap into these main lines and serve various buildings and areas within the civic center. An existing 2-inch meter serves the existing tennis court restroom and surrounding area.

Water meter records for the existing 2-inch meter for the past three years show an average daily use of about 18,800 gallons per day. Estimated domestic use and irrigation use are about 1,100 gallons per day and 17,700 gallons per day, respectively. Projected water use will be based on an increase in domestic water demands due to more tennis court users, an increase in irrigation demands due to new landscape irrigation, and a decrease in current irrigation demands due to a reduction in the current irrigated area.

The projected domestic water use will be based on the number of tennis court users per hour, the number of available playing hours per day, percent of time the courts are used, and domestic water demand of 5 gallons per person. It is anticipated that each tennis court will be used by four persons per court per hour; that each tennis court will be available for play from 7:00 a.m. to 10:00 p.m. or 15 hours per day; and that the courts will be used 75 percent of the time. The projected domestic water use is therefore 900 gallons per day. (4 courts x 4 persons/court/hour x 15 hours/day x 0.75 x 5 gallons/person = 900 gallons/day)

The projected irrigation water use will be based on the area of new plantings and an average irrigation water application rate. Approximately 43,500 square feet of area will be planted and irrigated. Average irrigation demand based on grass is 5,800 gallons per day. Existing irrigation demands will be reduced by about 50 percent due to a reduction in planted area.

The total projected water use is therefore 16,700 gallons per day—a reduction of 2,100 gallons per day or about 11 percent of current usage. (1,100 + 900 + 17,700 – 8,850 + 5,800 = 16,650 ≈ 16,700 gallons per day) The existing water system, including the source, distribution system, meter, and service lines, can provide this amount.

Water system improvements include relocating the existing water meter, rerouting of existing water service lines between the water meter and the restroom, and installing a new irrigation system within the graded area.

IV. WASTEWATER SYSTM

The County of Maui has wastewater collection and treatment facilities in Lahaina. The collection system consists of gravity sewers, force mains, and pump stations. The collection system carries wastewater to the Lahaina Wastewater Reclamation Facility for treatment and disposal.

The Department of Parks and Recreation recently completed a large cesspool closure project at the LCC. Improvements for the recent project consisted of closure of a large capacity cesspool serving the majority of the facilities, and construction of a gravity sewer along the civic center driveway, across the adjoining DHHL site, with a connection to the County collection system. The newly-constructed sewer line collects wastewater and directs it South to an existing manhole on the DHHL site. From this point, an existing sewer line carries the wastewater to the County of Maui collection system within Honoapiilani Highway.

The recent large cesspool closure project, however, did not include the closure of the cesspool for the tennis court restroom. Wastewater system improvements for this project will therefore consist of closure of the existing cesspool and construction of a sewer lateral from the restroom to the newly-constructed sewer line within the civic center driveway.

Projected wastewater flows will be based on a similar method used to determine domestic water use. The wastewater produced by users of the four new tennis courts is therefore 900 gallons per day. (4 courts x 4 persons/court/hour x 15 hours/day x 0.75 x 5 gallons/person = 900 gallons/day) In addition to this amount, wastewater produced by users of the existing five tennis courts will also be considered due to closure of the cesspool. The wastewater produced by users of the five existing tennis courts is therefore 1,125 gallons per day. The total projected wastewater flows is therefore 2,025 gallons per day.

V. ELECTRICAL, TELEPHONE & CABLE TELEVISION SYSTEMS

Maui Electric Company, Hawaiian Telcom, and Oceanic Time Warner Cable provide electrical, telephone, and cable television service for the area. Major existing overhead lines run along Honoapiilani Highway. Electrical improvements for this project include new lighting for the tennis courts, parking lot, and walkways. No telephone and cable television improvements are planned for this project.

VI. DRAINAGE SYSTEM

A. Topography

Improvements on the smaller LCC parcel include the civic center driveway, tennis complex, and landscaped areas. The civic center driveway is a two-lane road with concrete curb and gutter. Utility systems within the driveway include catch basins, drain lines, and a recently-constructed sewer line. The tennis complex consists of five tennis courts with lighting, fencing, and windscreens, open bleachers, a restroom building, asphalt walkways, retaining walls, and utility systems. Utility systems for the tennis complex include water service for the restroom, a cesspool for wastewater disposal, drainage swales, inlets, manholes, and pipes, underground electrical lines, and landscape irrigation. Landscape plantings include grass, and a few trees and shrubs.

Elevations of the site range from about 40 feet to 60 feet above mean sea level. The site generally slopes down from East to West. The steepest areas are at the easterly and southwesterly ends with slopes that range from about 20 to 40 percent. The flattest areas are at the northwesterly end of the site with slopes that range from about 4 to 8 percent. (See Figure 6 – Topographic Map, page 14.)

B. Soil

According to the Soil Conservation Service, the on-site soils include Wahikuli stony silty clay, 3 to 7 percent slopes (WcB) and Wahikuli very stony silty clay, 3 to 7 percent slopes (WdB). The Wahikuli series consists of well-drained soils on uplands on the island of Maui. The survey characterizes the soil as having a dark reddish-brown surface layer approximately 15 inches thick with stones that hinder cultivation, moderate permeability, slow to medium runoff, and slight to moderate erosion hazard. (See Figure 3 – Soil Map, page 11.)

C. Flood and Tsunami Hazard

The flood insurance rate map of the area shows there are no flood hazard areas on the site. The flood insurance rate map designates the site as Zone C, an area subject to minimal flooding. (See Figure 4 - Flood Insurance Rate Map, page 12.)

D. Existing Drainage Improvements

Existing on-site drainage improvements include catch basins, inlets, drain pipes, manholes, outlet structures, channels, and swales. Catch basins and inlets collect storm runoff from the site and drain pipes, channels, and swales carry the collected runoff to the makai side of the site.

There are two separate drainageways that route the on-site and off-site flows through the site. These drainageways convey flows from the high point at the easterly side of the site

to the northwesterly and southwesterly corners of the site. The following discussion will refer to these drainageways as the Northwest System and the Southwest System.

The Northwest System begins at the high point at the easterly side of the site. From this point, runoff enters a cut-off grassed swale which prevents off-site runoff from entering the tennis complex and directs runoff to the Northwest. Runoff continues through a concrete and rock channel, and flows through another grassed swale to an inlet on the back side of a catch basin at the intersection of the civic center driveway and the rear service road. At this point, runoff enters an underground drainage system which conveys runoff under the service road and civic center driveway, and discharges runoff downstream of the civic center driveway. The underground system consists of a series of 18-inch and 36-inch drain pipes, catch basins, and an outlet structure. Runoff from the outlet structure continues downstream through a concrete and rock channel to a 48-inch culvert at Honoapiilani Highway. The culvert conveys runoff under the highway and discharges it into the Wahikuli Wayside Park and into the ocean.

The Southwest System also begins at the high point at the easterly side of the site. From this point, runoff enters a cut-off grassed swale which prevents off-site runoff from entering the tennis complex and directs runoff to the South. The swale discharges runoff into a gully on the South side of the tennis complex. A concrete and rock channel intercepts flows from the gully and directs it to an underground drainage system which carries runoff under the civic center driveway and Leialii Parkway. The underground drainage system includes an inlet structure, 30-inch drain pipes, catch basins, a manhole, and an outlet structure. Runoff from the outlet structure continues downstream through another grassed swale to a triple 48-inch culvert at Honoapiilani Highway. The culvert conveys runoff under the highway and under the Wahikuli Wayside Park, and discharges it into the ocean. (See Figure 7 – Existing Drainage Plan, page 15.)

E. Proposed Drainage Improvements

The expansion of the tennis complex will affect the existing drainage improvements of the Northwest System. However, existing drainage improvements, of the Southwest System will remain. The proposed drainage improvements include swales, inlets, manholes, drain pipes, and a subsurface detention/retention basin. The proposed improvements consist of two separate parts that correspond to off-site and on-site flows. (See Figure 9 – Preliminary Grading and Drainage Plan, page 17.)

An existing paved roadway above the DHHL parcel with a cut-off ditch forms the upper limits of the off-site drainage area. From this upper limit, runoff flows across the undeveloped DHHL parcel and towards the proposed parking lot and tennis courts. To prevent this runoff from entering the tennis complex, a ditch will be constructed at the mauka boundary of the expansion area. Inlets within the ditch will collect runoff and direct it to the existing drainage system within the rear service road. (See Figure 8 – Drainage Area Map, page 16.)

The easterly property line forms the upper limits of the on-site drainage area. Under existing conditions, swales and channels capture runoff and direct it to an underground drainage system. The expansion will displace these existing improvements and will replace them with drain inlets, manholes, drain pipes, and a subsurface detention/retention basin. The subsurface detention/retention, consisting of a large-diameter perforated pipe in a gravel bed, a flow control manhole, and an outlet pipe, will keep the post-development flow rates and volumes and pre-development levels. (See Figure 9 – Preliminary Grading and Drainage Plan, page 17.)

The County drainage standards require the use of a 50-year, 1-hour rainfall for computing volumes and rates of flow. However, there are more stringent guidelines contained in the West Maui Watershed Owner's Manual prepared by the West Maui Watershed Management Advisory Committee. Because this project is in West Maui, the more stringent guidelines will be used.

The design criteria for the on-site area include:

- Maintaining pre-development runoff volumes for a 2-year, 24-hour storm
- Maintaining pre-development peak flow rates for a 50-year, 1-hour storm

Drainage improvements that involve transmission of storm flows will conform to the "Rules for the Design of Storm Drainage Facilities in the County of Maui." The rules will be applied to the sizing and spacing of inlets and manholes, and sizing of drain lines, channels, and culverts. Based on the County rules, the drainage system will be designed to handle a storm with a recurrence interval of 50 years since the drainage area is less than 100 acres.

The following is a summary of hydrologic design data for on-site area. (See Appendix A - Preliminary Drainage Information.)

Item	Existing	Developed
Drainage Area	2.04 acres	2.04 acres
2-year, 24-hour Rainfall	3.2 inches	3.2 inches
2-year, 24-hour Volume	6,900 cubic feet	10,400 cubic feet
50-year, 1-hour Rainfall	2.5 inches	2.5 inches
50-year, 1-hour Peak Flow	3.90 cfs	8.37 cfs

The increase in the rate of runoff and volume of runoff will be mitigated by constructing the detention/retention basin. The detention/retention basin will collect runoff, regulate the outflow of runoff, and retain a portion of the collected runoff. As shown in the preliminary computations, a detention volume of 2,500 cubic feet is required to reduce the peak outflow from 8.37 cubic feet per second to 3.90 cubic feet per second. Also as shown in the preliminary computations, a retention volume of 3,500 cubic feet is required to keep runoff volumes at pre-development levels. The required volumes will be provided by a 5-foot

diameter by 230-foot long subsurface perforated pipe embedded in a 1-foot thick rock cradle.

The Preliminary Grading and Drainage Plan shows the proposed grading and drainage improvements. (See Figure 9 - Preliminary Grading and Drainage Plan, page 17.)

The following is a summary of preliminary design data for the drainage/retention basin. These figures are subject to adjustment as the designs are further refined.

Detention Volume	2,500 cubic feet
Retention Volume	3,500 cubic feet
Flow Rate In	8.37 cubic feet per second
Flow Rate Out	3.90 cubic feet per second

D. Conclusion

There will be no adverse effects on the adjacent or downstream properties due to this project. This conclusion is based on maintaining peak discharge rates and volumes at pre-development levels.

VII. REFERENCES

1. City and County of Honolulu, Department of Public Works, Division of Engineering, *Storm Drainage Standards*, Honolulu, Hawaii, May 1988.

2. County of Maui, "Title MC-15, Department of Public Works and Waste Management, Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui," Wailuku, Hawaii, November 1995.

3. Federal Emergency Management Agency, Federal Insurance Administration, *Flood Insurance Study, Maui County, Hawaii*, December 1, 1980.

4. R. M. Towill Corporation, *Drainage Master Plan for the County of Maui*, Honolulu, Hawaii, October 1971.

5. U. S. Department of Agriculture, Soil Conservation Service, *Erosion and Sediment Control Guide for Hawaii*, Honolulu, Hawaii, March 1981.

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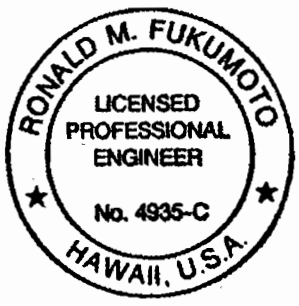
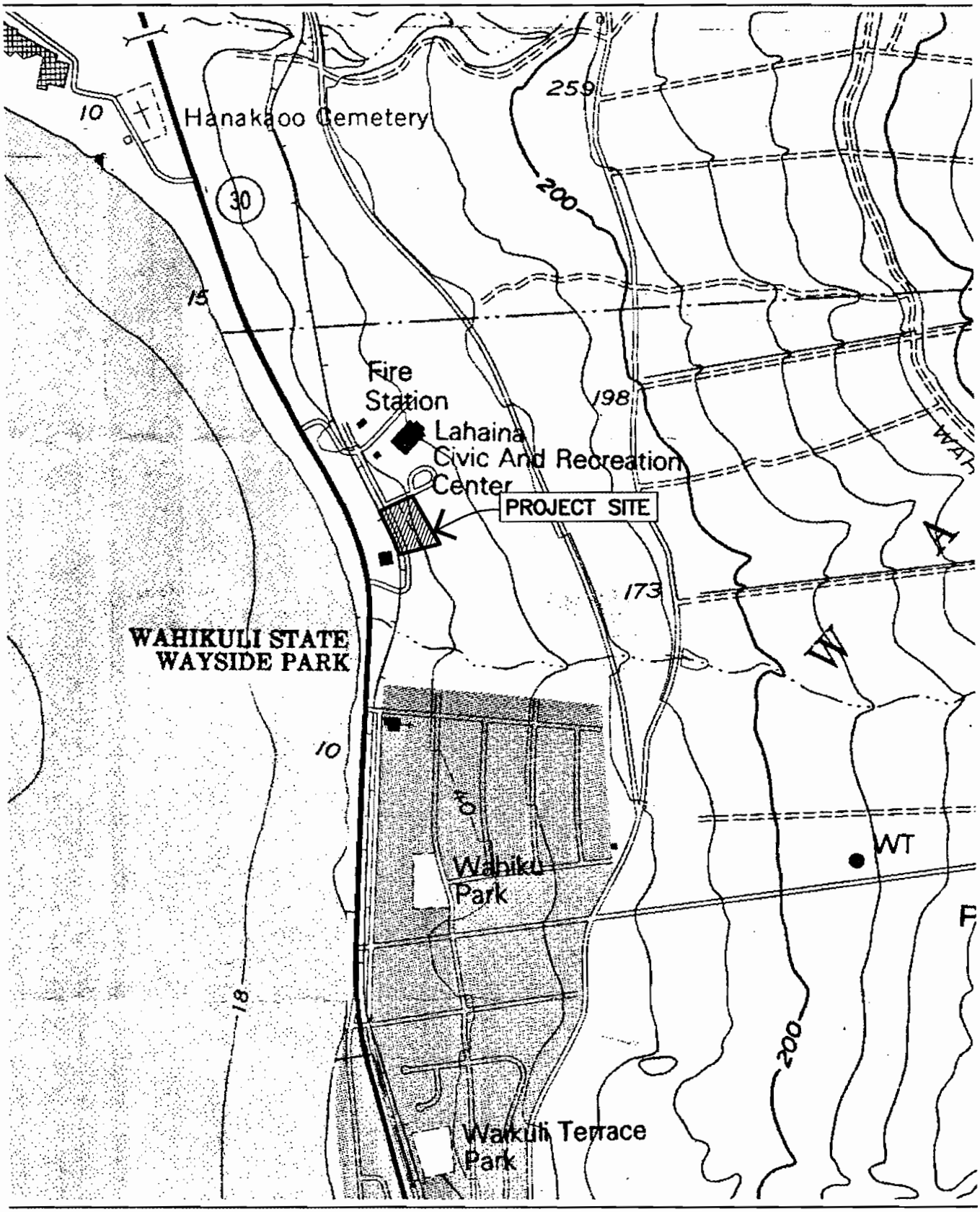
8. U. S. Department of Commerce, Weather Bureau, *Rainfall-Frequency Atlas of the Hawaiian Islands for Areas to 200 Square Miles, Durations to 24 Hours, and Return Periods from 1 to 100 Years*, Technical Paper No. 43, Washington, D.C., 1962.

9. West Maui Watershed Management Advisory Committee, *West Maui Watershed Owners Manual*, Honolulu, Hawaii, November 1997.



This work was prepared by
me or under my supervision.

Ronald M. Fukumoto



LOCATION MAP (USGS MAP)

Figure 1

SCALE IN FEET

NORTH 0 500 1000 2000 3000

SOURCE: USGS LAHAINA QUADRANGLE MAP

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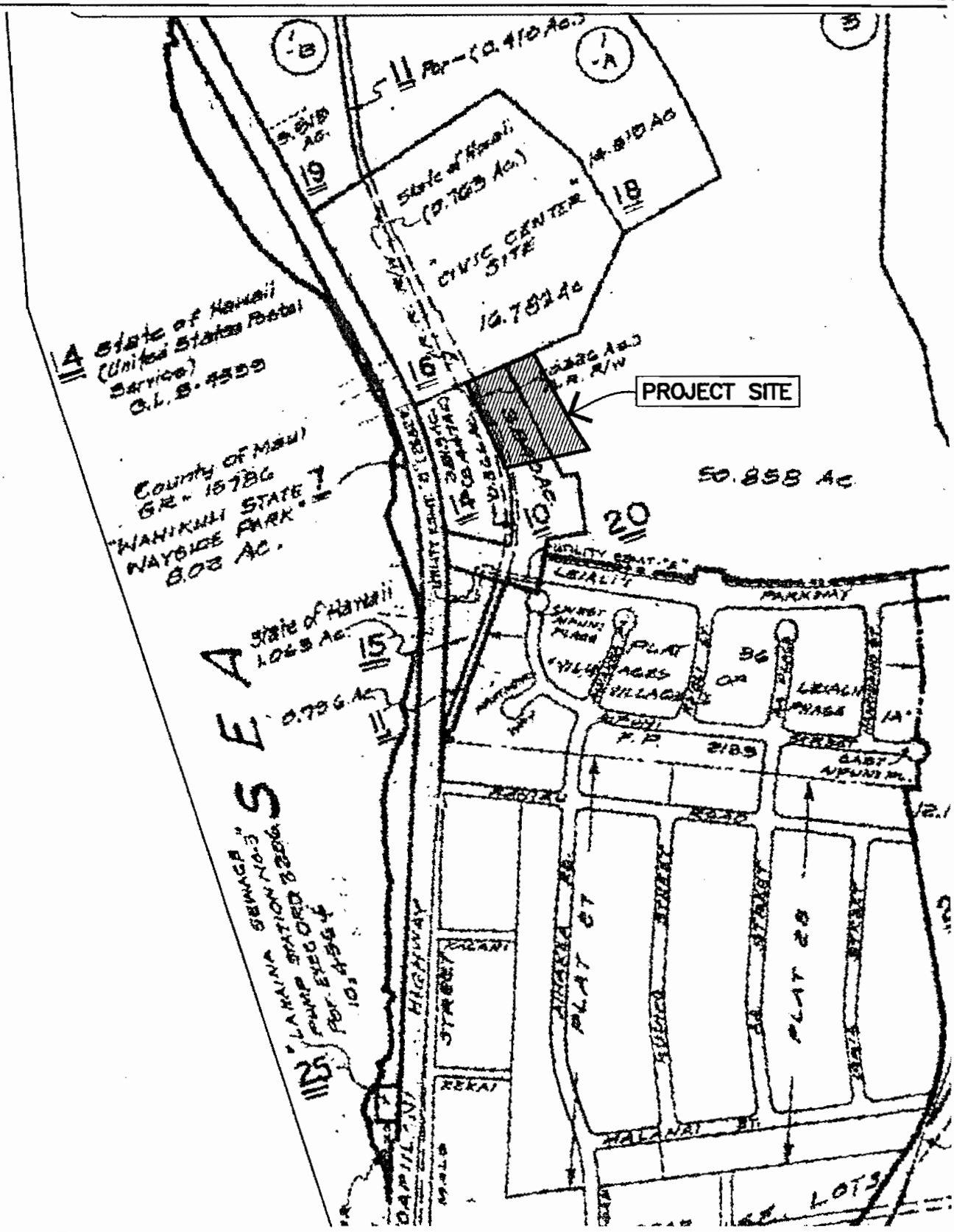

VICINITY MAP (TAX MAP)

Figure 2

SCALE IN FEET

NORTH 0 250 500 1000 1500

SOURCE: TAX MAP KEY (2) 4-5-021-010 & 020

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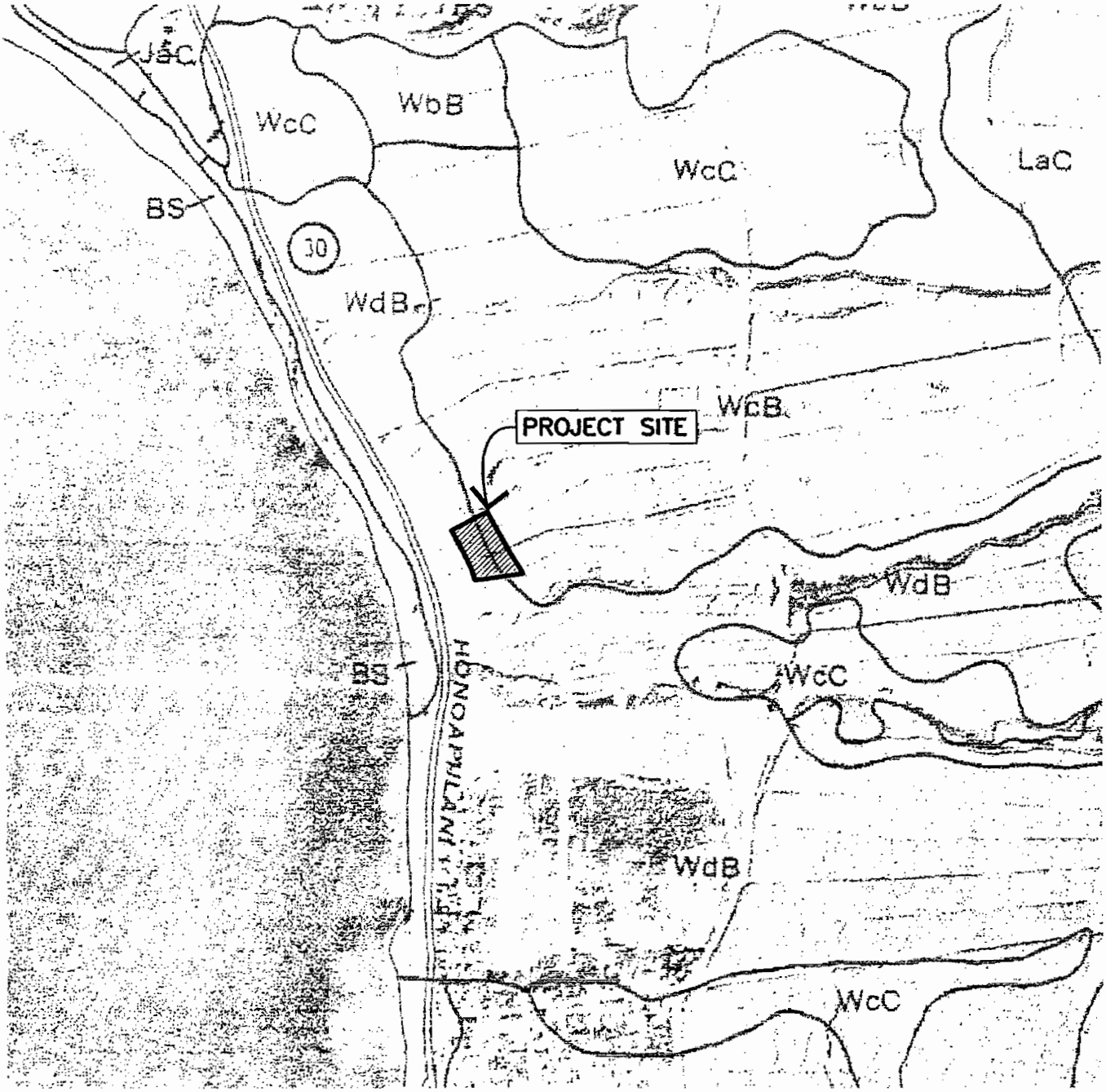
PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



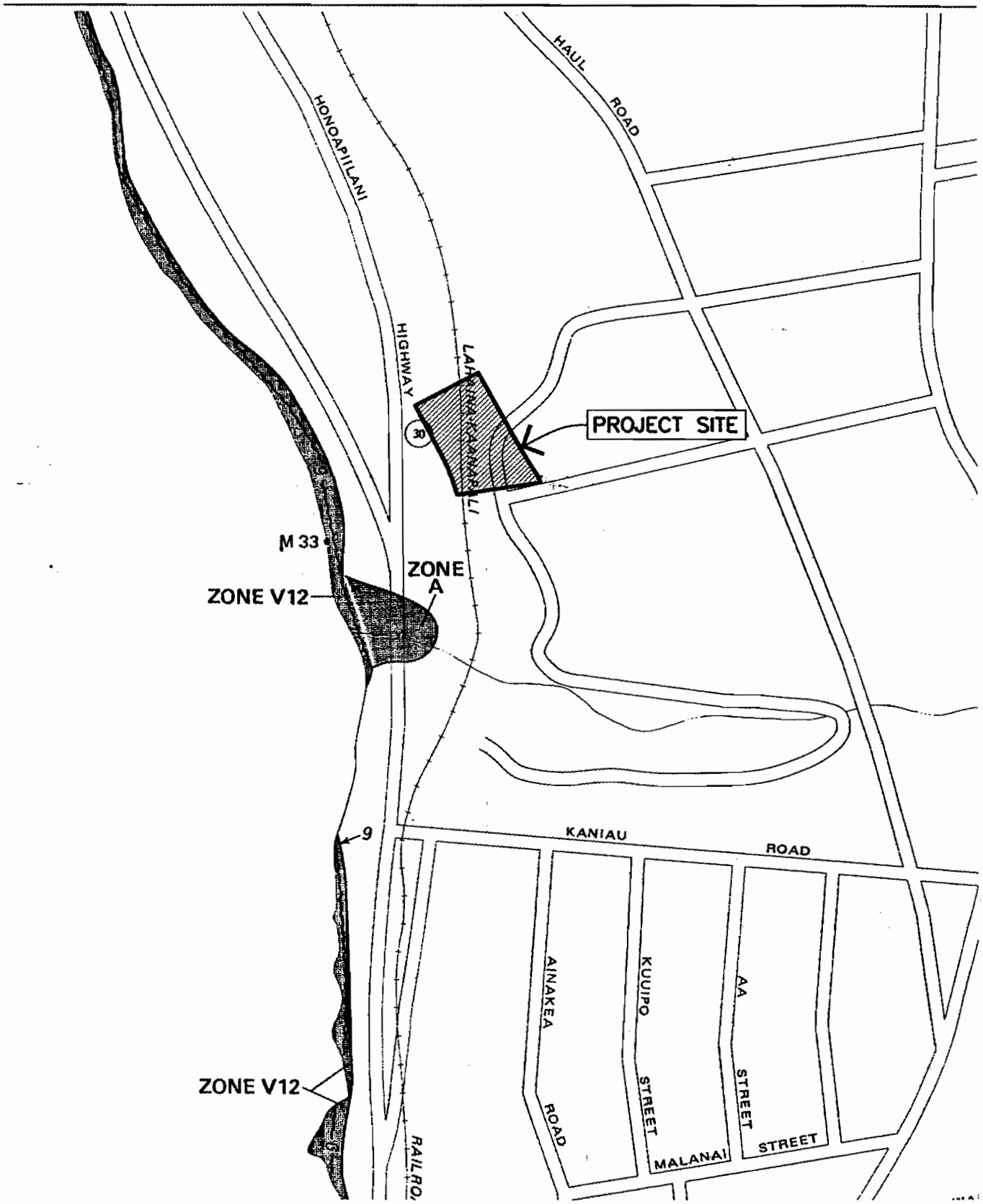
SOIL MAP

SCALE IN FEET

NORTH 0 500 1000 2000 3000

Figure 3

SOURCE: SOIL SURVEY



FLOOD INSURANCE RATE MAP

Figure 4

SCALE IN FEET

NORTH 0 250 500 1000 1500

SOURCE: FIRM COMM. PANEL NO. 150003 0161C

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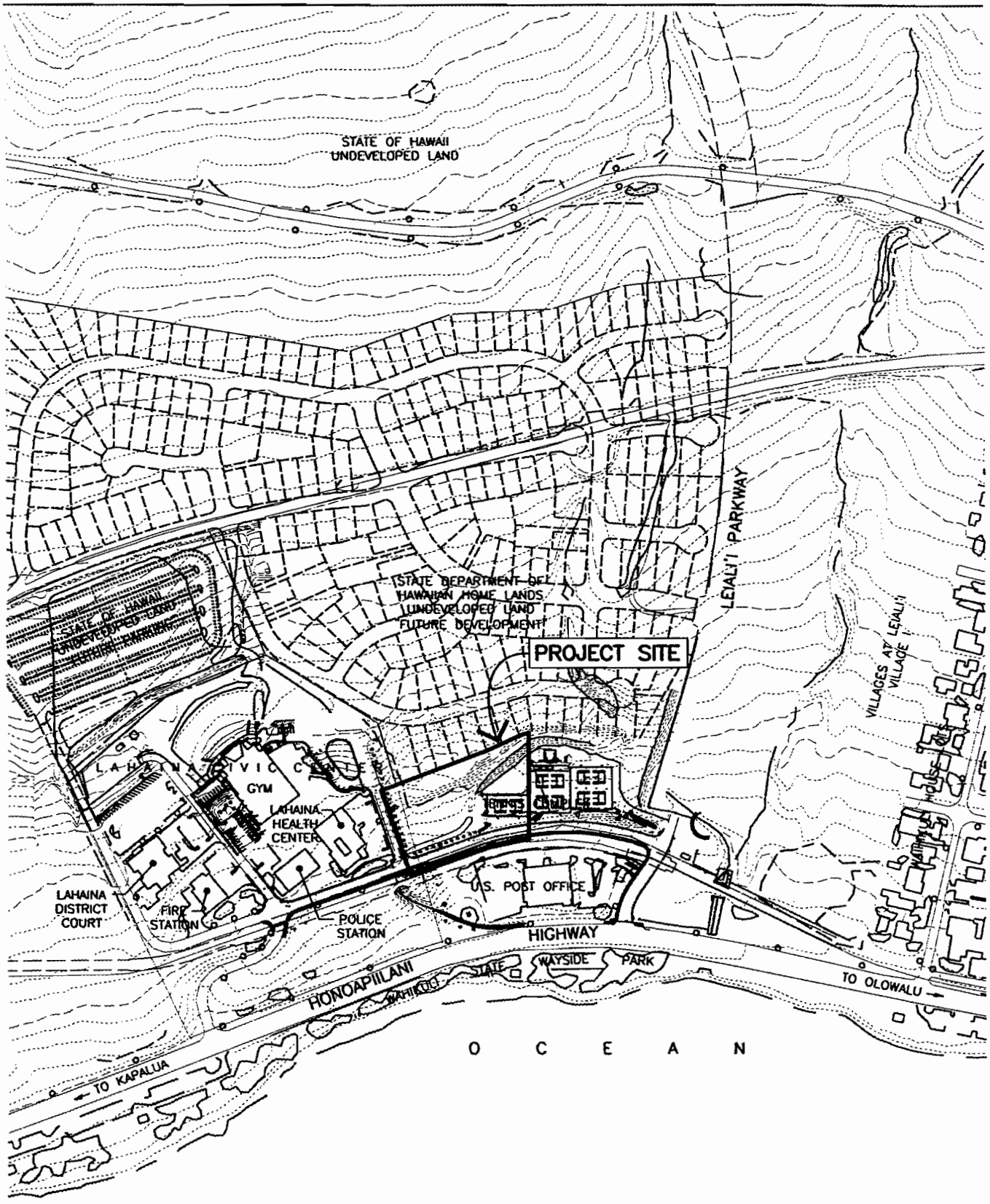
PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



REGIONAL TOPOGRAPHIC MAP

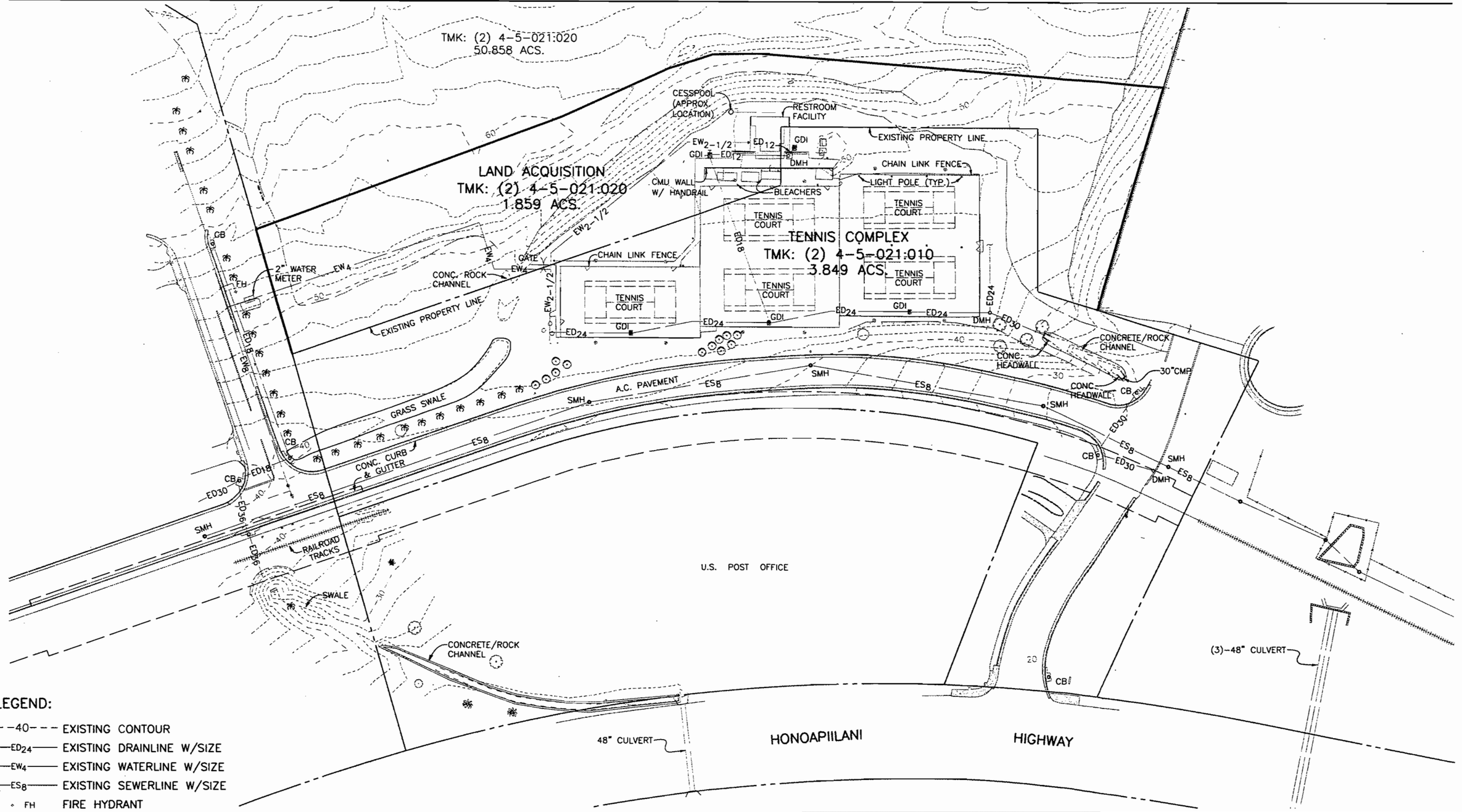
SCALE IN FEET

NORTH 0 200 400 800 1200

Figure 5

DATE: 6/06/08

PREPARED FOR: DEPT. OF PARKS & RECREATION, COUNTY OF MAUI PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



LEGEND:

- EXISTING CONTOUR
- ED_{24} EXISTING DRAINLINE W/SIZE
- EW_4 EXISTING WATERLINE W/SIZE
- ES_8 EXISTING SEWERLINE W/SIZE
- FH FIRE HYDRANT
- SMH SEWER MANHOLE
- DMH DRAIN MANHOLE
- GDI GRATED DRAIN INLET
- CB CATCH BASIN
- CMU CONCRETE MASONRY UNIT

TOPOGRAPHIC MAP

SCALE IN FEET

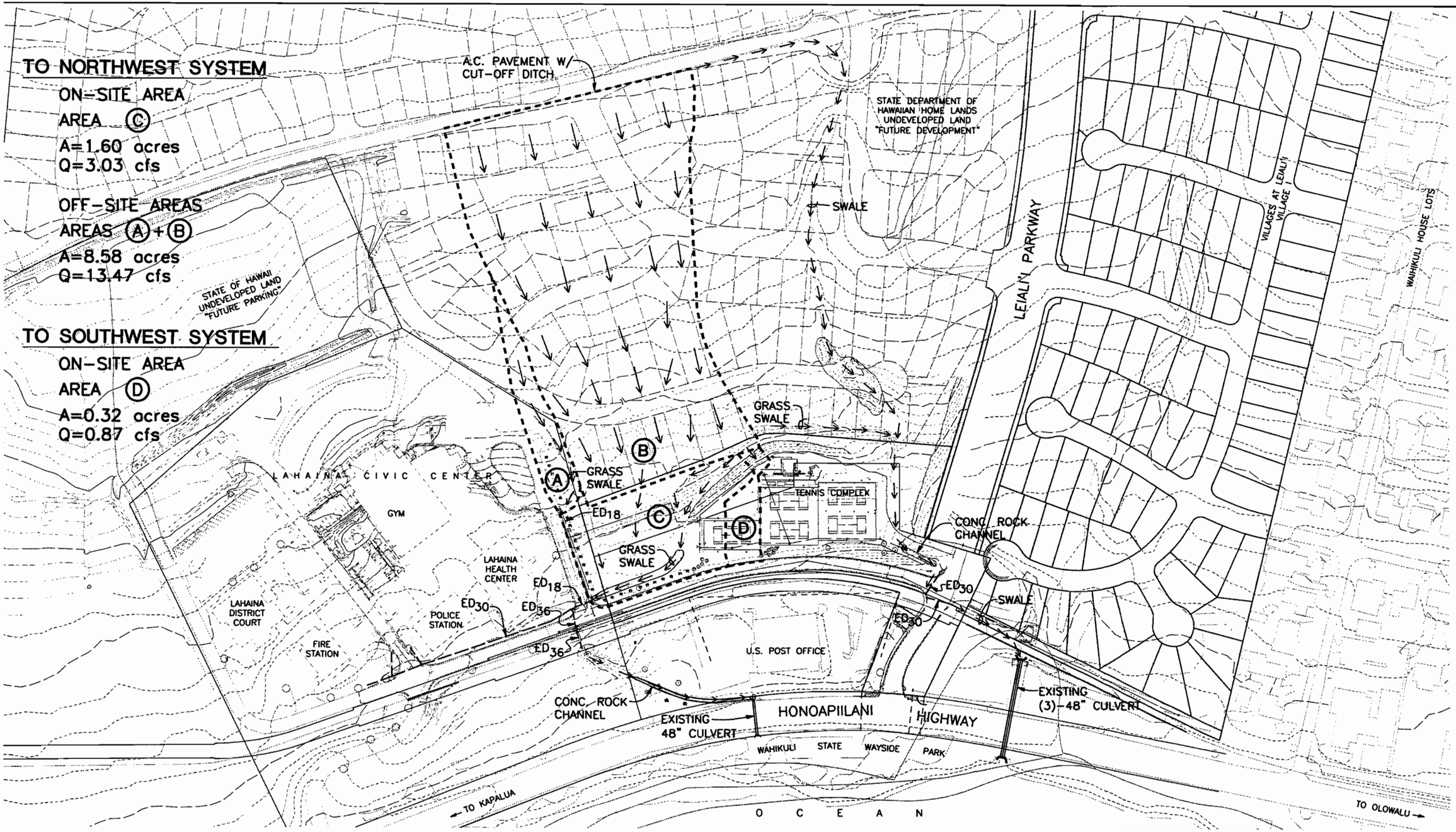
NORTH 0 40 80 160 240

Figure 6

DATE: 6/06/08

PREPARED FOR: DEPT. OF PARKS & RECREATION, COUNTY OF MAUI

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



LEGEND:

------ LIMITS OF DRAINAGE AREA

DRAINAGE AREA MAP - EXISTING

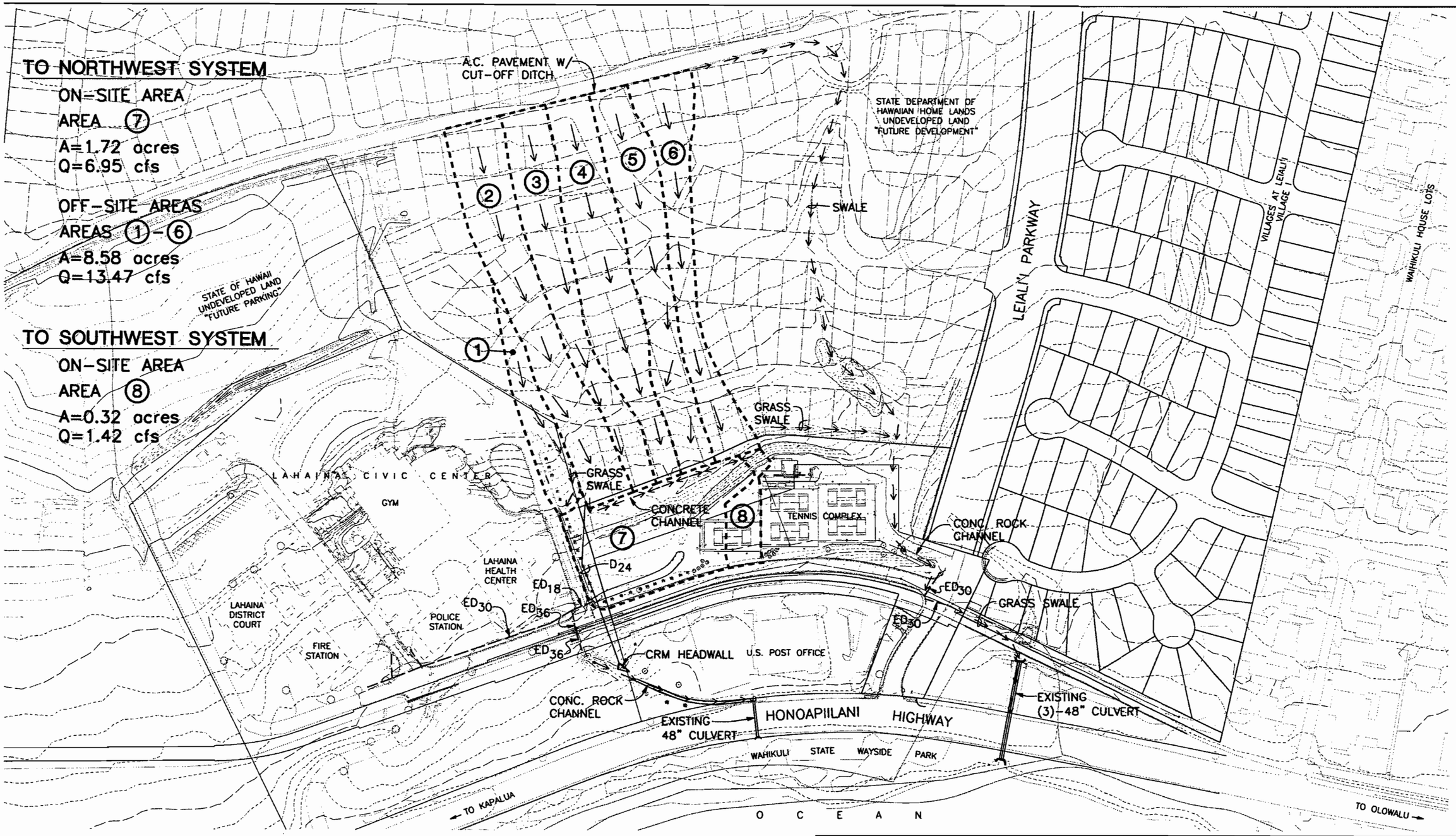
SCALE IN FEET

NORTH 0 100 200 400 600

Figure 7

DATE:6/06/08

PREPARED FOR: DEPT. OF PARKS & RECREATION, COUNTY OF MAUI PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



LEGEND:

- - - - - - LIMITS OF DRAINAGE AREA

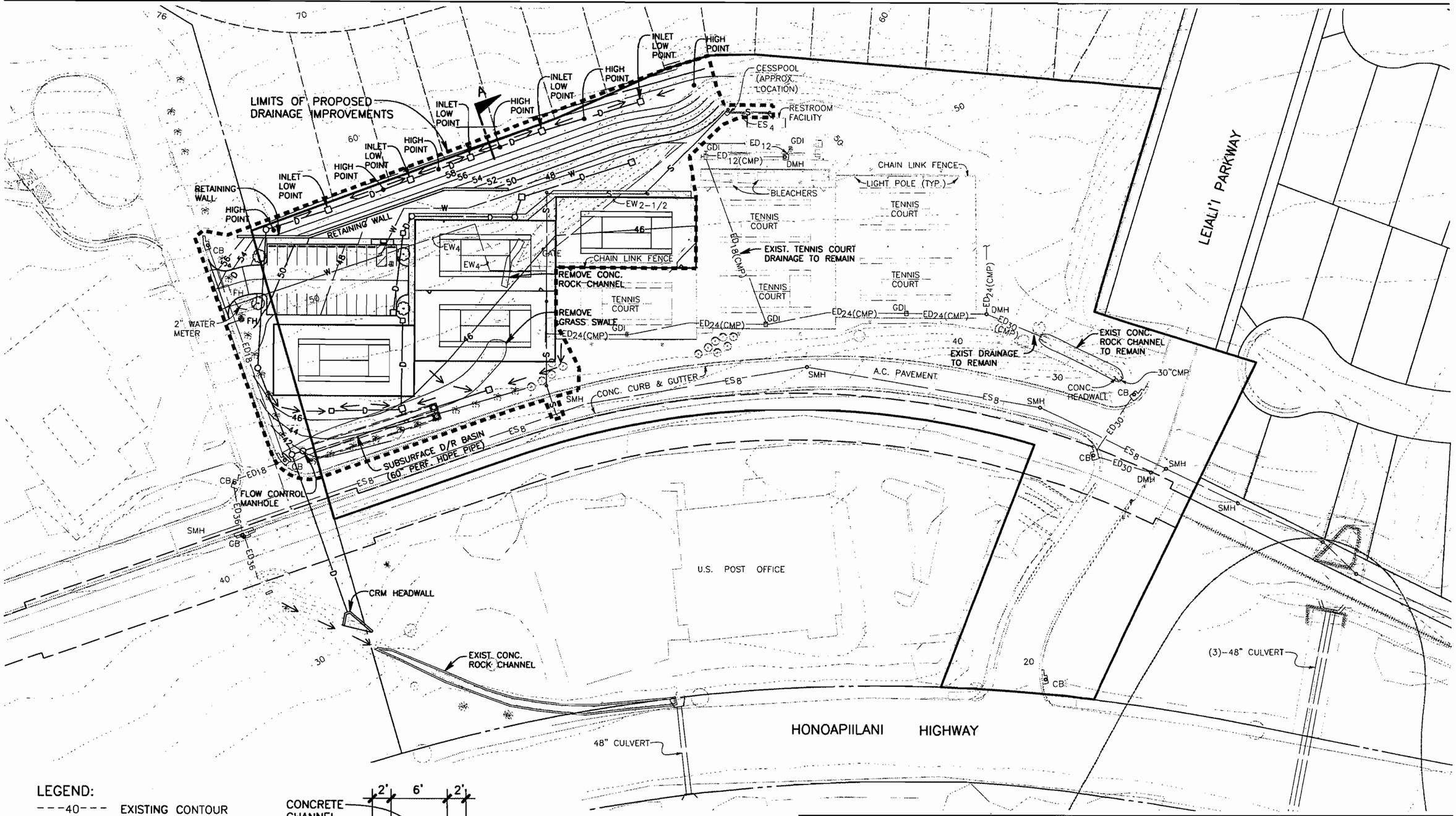
DRAINAGE AREA MAP - DEVELOPED

SCALE IN FEET

NORTH 0 100 200 400 600

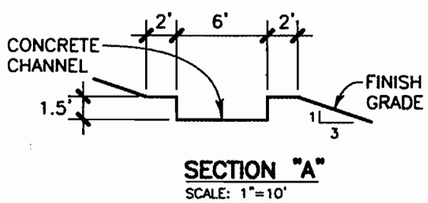
Figure 8
DATE: 6/06/08

PREPARED FOR: DEPT. OF PARKS & RECREATION, COUNTY OF MAUI PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



LEGEND:

- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAIN MANHOLE
- DRAIN INLET
- SWALE



SECTION "A"
SCALE: 1"=10'

NORTH

PRELIMINARY GRADING & DRAINAGE PLAN

SCALE IN FEET 0 40 80 160 240

Figure 9
DATE: 6/06/08

PREPARED FOR: DEPT. OF PARKS & RECREATION, COUNTY OF MAUI
PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.

PRELIMINARY DRAINAGE INFORMATION

A. RUNOFF COEFFICIENT

1. Existing Conditions

	Area(acres)	Coefficient
Off-site areas draining to Northwest System		
a. Area A		
Landscaped/Unimproved Areas	0.51	0.30
Buildings/Roadways/Walkways	0.07	0.90
Total Area A =	0.58	
$C_{composite}$ = [(0.51x 0.30) + (0.07 x 0.90)] / 0.58 =	0.37	
b. Area B		
Landscaped/Unimproved Areas	8.00	0.30
Total Off-site Area (Areas A and B) = 8.58 acres		
On-site areas draining to Northwest System		
c. Area C		
Landscaped/Unimproved Areas	1.60	0.30
Buildings/Roadways/Walkways	0.12	0.90
Subtotal Area C =	1.72	
$C_{composite}$ = [(1.60 x 0.30) + (0.12 x 0.90)] / 1.72 =	0.34	
On-site areas draining to Southwest System		
d. Area D		
Landscaped/Unimproved Areas	0.20	0.30
Buildings/Roadways/Walkways	0.12	0.90
Subtotal Area D =	0.32	
Total On-site Area (Areas C and D) = 2.04 acres		

2. Developed Conditions – Subdivision Site

On-site areas draining to Northwest System		
a. Area 7		
Landscaped/Unimproved Areas	0.77	0.30
Buildings/Roadways/Walkways	0.95	0.90
Subtotal Area C =	1.72	
$C_{composite}$ = [(0.77 x 0.30) + (0.95 x 0.90)] / 1.72 =	0.63	
On-site areas draining to Southwest System		
b. Area 8		
Landscaped/Unimproved Areas	0.11	0.30
Buildings/Roadways/Walkways	0.21	0.90
Subtotal Area D =	0.32	

$C_{composite} = [(0.11 \times 0.30) + (0.21 \times 0.90)] / 0.32 = 0.69$

B. RECURRENCE INTERVAL & RAINFALL
1. Recurrence interval $T_m = 50$ years (due to sump conditions)
2. One-hour rainfall $I_{50} = 2.5$ inches

C. TIME OF CONCENTRATION
1. Existing Conditions $T_c = 10$ minutes
2. Developed Conditions $T_c = 5$ minutes

D. EXISTING RUNOFF (Rational Method)
1. Off-site Area (Areas A and B)
   a. C = 0.305
   b. i = 2.5 x 2.06 = 5.15
   c. a = 8.58 acres
   d. Q = Cia = 0.30 x 5.15 x 8.58 = 13.47 cfs
2. On-site Area (Areas C and D)
   a. C = 0.371
   b. I = 2.5 x 2.06 = 5.15
   c. a = 2.04 acres
   d. Q = Cia = 0.371 x 5.15 x 2.04 = 3.90 cfs

E. DEVELOPED RUNOFF (Rational Method)
1. On-site Area (7 and 8)
   a. C = 0.641
   b. I = 2.5 x 2.56 = 6.40
   c. a = 2.04 acres
   d. Q = Cia = 0.64 x 6.40 x 2.04 = 8.37 cfs

F. INCREASE DUE TO DEVELOPMENT (Rational Method)
1. On-site Area (Lahaina Civic Center – Tennis Center including land acquisition)
   $\Delta Q = 8.37 - 3.90 = 4.47$ cfs (for 50-year, 1-hour storm)

G. CURVE NUMBER (CN) COMPUTATION
1. Existing

Open Space	CN = 69	Area = 1.80 acres
Building, Parking, & Walkways	CN = 95	Area = 0.24 acres
	CN = [(69x1.80)+(95x0.24)/2.04] = 72	

2. Developed

Open Space	CN = 61	Area = 0.88 acres
Building, Parking, & Walkways	CN = 95	Area = 1.16 acres
	CN = [(61x0.88)+(95x1.16)/2.04] = 80	

H. RAINFALL DATA
1. 50-year, 1-hour P = 2.5 inches
2. 2-year, 24-hour P = 3.2 inches

I. RETENTION VOLUME

1. 50-year, 1-hour
   a. Existing – 2.04 acres
      $S = (1000/CN) - 10 = (1000/72) - 10 = 3.89$
      $Q = (P-0.2S)^2/(P+0.8S) = (2.5-0.2x3.89)^2/(2.5+0.8x3.89) = 0.53$ inch
      Volume = (0.53/12)x2.04x43,560 = 3,914 cu. ft.
   b. Developed – 2.04 acres
      $S = (1000/CN) - 10 = (1000/80) - 10 = 2.50$
      $Q = (P-0.2S)^2/(P+0.8S) = (2.5-0.2x2.50)^2/(2.5+0.8x2.50) = 0.89$ inch
      Volume = (0.89/12)x2.04x43,560 = 6,582 cu. ft.
   c. Increase due to development
      $\Delta V = 3,914 - 6,582 = 2,688$ cu. ft.
2. 2-year, 24-hour
   a. Existing – 2.04 acres
      $S = (1000/CN) - 10 = (1000/72) - 10 = 3.89$
      $Q = (P-0.2S)^2/(P+0.8S) = (3.2-0.2x3.89)^2/(3.2+0.8x3.89) = 0.93$ inch
      V = (0.93/12)x2.04x43,560 = 6,884 cu. ft.
   b. Developed – 2.04 acres
      $S = (1000/CN) - 10 = (1000/80) - 10 = 2.50$
      $Q = (P-0.2S)^2/(P+0.8S) = (3.2-0.2x2.50)^2/(3.2+0.8x2.50) = 1.40$ inch
      V = (1.40/12)x2.04x43,560 = 10,382 cu. ft.
   c. Increase due to development
      $\Delta V = 6,884 - 10,382 = 3,498$ cu. ft.
3. Required Retention Volume
   The County drainage rules require retaining the increase in runoff volume due to a 50-year, 1-hour storm. However, the West Maui Watershed Owners Manual guidelines recommend retaining the increase in runoff volumes due to a 2-year, 24-hour storm. The computations above show that the 2-year, 24-hour storm results in large volumes; therefore, the larger amounts will be used.

J. DETENTION VOLUME

RATIONAL METHOD DETENTION BASIN SIZING

Design Data

Drainage Area = A =	2.04	acres
Developed Runoff Coefficient = C =	0.64	
Design Storm =	50	year
One Hour Rainfall = i =	2.50	inches
Present Peak Discharge = Q_{OUT} =	3.90	cfs
Developed Peak Discharge = Q_{IN} =	8.37	cfs
Q_{OUT} / Q_{IN} =	0.47	
Outflow Adjustment Coefficient = k =	0.86	

Storm Duration, minutes	Correction Factor	Rainfall Intensity, in./hr.	Runoff Volume, cu. ft.	Outflow Volume, cu. ft.	Storage Volume, cu. ft.	
T	*f*	*I = fi*	*CIAT*	$kQ_{OUT}T$	(4) - (5)	
(1)	(2)	(3)	(4)	(5)	(6)	
5.0	2.5575	6.394	2,525	1,006	1,519	
10.0	2.0576	5.144	4,063	2,012	2,051	
11.0	2.0135	5.034	4,374	2,214	2,160	
12.0	1.9689	4.922	4,666	2,415	2,251	
13.0	1.9244	4.811	4,940	2,616	2,324	
13.8	1.8894	4.724	5,149	2,777	2,372	
13.9	1.8850	4.713	5,174	2,797	2,377	
14.0	1.8807	4.702	5,199	2,817	2,382	
15.0	1.8381	4.595	5,445	3,019	2,426	
16.0	1.7971	4.493	5,678	3,220	2,458	
17.0	1.7578	4.395	5,901	3,421	2,480	
18.0	1.7205	4.301	6,116	3,622	2,494	
19.0	1.6855	4.214	6,324	3,824	2,500	
20.0	1.6529	4.132	6,528	4,025	2,503	
21.0	1.6227	4.057	6,729	4,226	2,503	peak
22.0	1.5946	3.987	6,928	4,427	2,501	
23.0	1.5684	3.921	7,123	4,629	2,494	
24.0	1.5438	3.860	7,317	4,830	2,487	
25.0	1.5206	3.802	7,507	5,031	2,476	
26.0	1.4986	3.747	7,694	5,232	2,462	
27.0	1.4775	3.694	7,878	5,433	2,445	
28.0	1.4572	3.643	8,057	5,635	2,422	
29.0	1.4376	3.594	8,233	5,836	2,397	
30.0	1.4184	3.546	8,403	6,037	2,366	

Required Detention Volume = 2,503 ≈ 2,500 cubic feet to reduce developed flow from 8.37 cfs to pre-development flow of 3.90 cfs.

K. DETENTION/RETENTION PIPE PRELIMINARY DESIGN

The drainage basin will consist of large-diameter corrugated aluminum pipe in a gravel bed of filter rock. The basin will be designed to keep peak flow rates due to a 50-year, 1-hour storm at pre-development levels and to keep runoff volumes due to a 2-year, 24-hour storm at pre-development levels. The following are preliminary sizing computations.

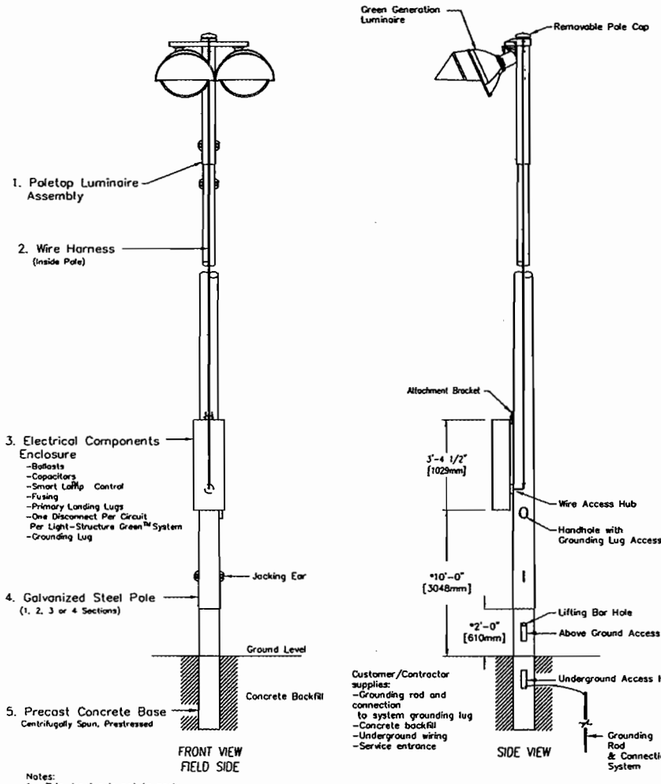
1. Required detention volume = V = 2,500 cubic feet
2. Required retention volume = V = 3,500 cubic feet
3. Use 5-foot diameter perforated corrugated aluminum pipe in 7-foot deep by 7-foot wide gravel bed consisting of "4-C" filter rock.
4. Pipe Area = Πr^2 = Π x 2.5^2 = 19.63 square feet
5. Gravel Area = (7x7) – 19.63 = 29.37 square feet
6. Gravel Void Area = 29.37 x 0.45 = 13.21 square feet
7. Allowable Gravel Void Area = 13.21x 0.50 = 6.61 square feet
8. Pipe Area + Allowable Gravel Void Area = 19.63 + 6.61 = 26.24 square feet
9. Required Length = (2,500 + 3,500) / 26.24 = 6,000 / 26.24 = 230 feet
10. Set height of outlet pipe within D/R pipe so that 3,500 cubic feet of runoff is retained within pipe.

APPENDIX F.

Light Pole Details

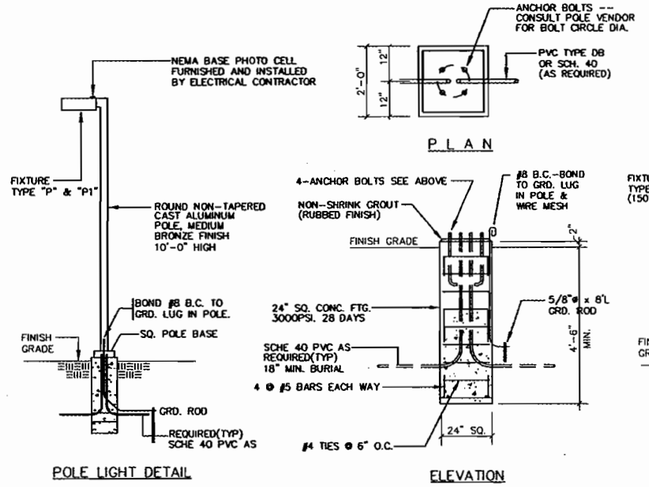
LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	LAMPS
A	METAL HALIDE POLE MOUNTED FIXTURE, TWO FIXTURES PER POLE, DIE CAST ALUMINUM HOUSING. HIGH IMPACT RESISTANT LENS, SEALED AND GASKETED. REMOTE BALLAST SUITED FOR 208V, 1 PHASE, 60 HZ. POLE: 40' TAPERED ROUND STEEL GALVANIZED POLE ON A CONCRETE BASE.	MUSCO FIX: (2)LV8-1500-MZ POLE: LSS4042-SC2-1500	1-1500W MH
A1	SIMILAR TO TYPE 'A' EXCEPT ONLY ONE FIXTURE ON POLE.	MUSCO FIX: (2)LV8-1500-MZ POLE: LSS4042-SC2-1500	1-1500W MH
B	HIGH PRESSURE SODIUM, POLE MTD. AREA LIGHT, FULL CUT-OFF, 120V WITH PHOTOCELL, MTD ON 12' ANODIZED ALUMINUM POLE.	STERNER EXEC/50R19/100MPS/120/C/10/N/PRL/BZ POLE: RAT12.5/4.5X3.0/0.125/10/BZ	100W HPS
C	HIGH PRESSURE SODIUM, POLE MTD. PARKING LIGHT. FULL CUT-OFF, 120V WITH PHOTOCELL, MTD ON 16' ANOZIDED SQUARE NON-TAPERED ALUMINUM POLE.	KIM 1A/CC25A3/150HPS120/CC-P/A-31/PRA16/34188/CC-P	150W HPS

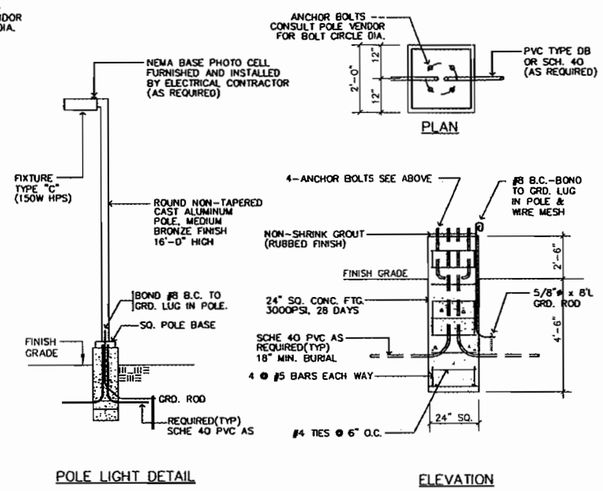


Notes:
1. This drawing is not to scale.
2. * This dimension for reference only. Variances may occur depending on steel pole tolerances, concrete tolerances, galvanizing thickness, hole depth accuracy.
3. Musco provides a base installation bar, an installation level modified for taper, and installation wedges.
4. Provisions for auxiliary equipment such as speaker or security lighting can be incorporated.
5. Copyright 1991, 2005 Musco Lighting. Patents issued and pending.

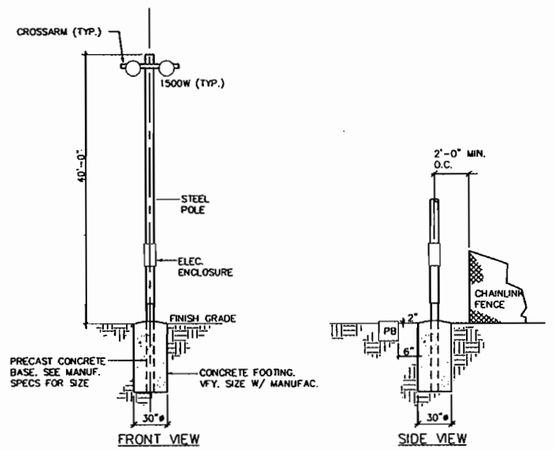
A / E-5 **POLE DETAIL**
NOT TO SCALE



AREA/WALKWAY LIGHT DETAIL
NOT TO SCALE



PARKING LIGHT DETAIL
NOT TO SCALE



GENERAL NOTES:

1. ALL POLES AND FIXTURES BY MUSCO SPORTS LIGHTING, INC. REFERENCE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. ALL REQUIREMENTS TO BE COORDINATED AND VERIFIED WITH MANUFACTURER PRIOR TO INSTALLATION.

LIGHTING SYSTEM SUMMARY (TENNIS COURT A) :
4-40' POLES, 4-1500W FIXTURES
(1-1500W FIXTURES PER POLE)
AT 208V, 1 PHASE.

LIGHTING SYSTEM SUMMARY (TENNIS COURT B & C) :
4-40' POLES, 8-1500W FIXTURES
(2-1500W FIXTURES PER POLE)
AT 208V, 1 PHASE.

B / E-5 **TYPICAL POLE LIGHT DETAILS**
NOT TO SCALE

26072-E5

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Electrical Engineering Consultants
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MARK P. RICKARD
LICENSED PROFESSIONAL ENGINEER
No. 8991-E
HAWAII, U.S.A.

APRIL 2010
EXPIRATION DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION (SUPERVISION OF CONSTRUCTION AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82: RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

Note: Contractor shall check and verify all dimensions at job before job before proceeding with work.

REVISIONS			
NO	DATE	DESCRIPTION	INI

JOB NO. 26072
DATE: 5/08
DRAWN BY: RMB
DESIGNED BY: MPR
CHECKED BY: MPR

ELECTRICAL PLANS FOR:
LAHAINA CIVIC CENTER
TENNIS COURTS
LAHAINA, MAUI, HAWAII TMK: (2) 4-5-021:010

SHEET NO.
E-5
7 OF 8 SHEETS