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Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director



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MAY 23 2015

COUNTY OF MAUI

DEPARTMENT OF PLANNING

May 13, 2015

OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

15 MAY 13 P1:22

RECEIVED

Ms. Jessica Wooley, Director
Office of Environmental Quality Control
State of Hawaii, Department of Health
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Ms. Wooley:

SUBJECT: CHANGE IN ZONING, SPECIAL MANAGEMENT AREA (SMA) AND DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED CONSTRUCTION OF A NEW APPROXIMATELY 14,550 SQUARE FOOT WALGREENS STORE WITH SITE IMPROVEMENTS INCLUDING PARKING, LANDSCAPING AND WIDENING OF SOUTH KIHEI ROAD AND NOHOKAI STREET, LOCATED AT THE SOUTHEAST CORNER OF SOUTH KIHEI ROAD AND NOHOKAI STREET, KIHEI, ISLAND OF MAUI, HAWAII; TMK: (2) 3-9-007:037, 038, 039, 040 and (2) 3-9-008:016 (CIZ 2015/0003)(SM1 2015/0005) (EA 2015/0005)

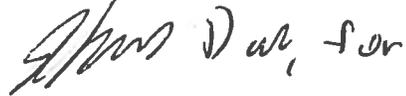
With this letter, the Department of Planning hereby transmits the Draft Environmental Assessment (EA) and Anticipated Finding of No Significant Impact (FONSI) for the proposed Walgreens Kihei Project situated at Tax Map Key (2) 3-9-007:037-0000, in the Kihei District on the island of Maui for publication in the next available edition of the Environmental Notice.

Attached is a completed Office of Environmental Quality Control Publication Form, two (2) copies of the Draft EA and FONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

Thank you for your cooperation. If additional clarification is needed, please contact Current Planning Supervisor Ann Cua at ann.cua@mauicounty.gov or by phone at (808) 270-7521.

Ms. Jessica Wooley, Director
May 13, 2015
Page 2

Sincerely,



CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for WILLIAM SPENCE
Planning Director

Attachments

xc: Clayton I. Yoshida, AICP, Planning Program Administrator (PDF)
Ann Cua, Current Planning Supervisor (PDF)
Candace R. Thackerson, Staff Planner (PDF)
Lawrence Adler, Walgreen of Maui (PDF) lawrence.adler@walgreens.com
Tom Schnell, PBR Hawaii & Associates (PDF) tschnell@pbrhawaii.com
Project File
General File

WRS:CIY:ATC:CRT:ct

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**APPLICANT ACTIONS
SECTION 343-5(C), HRS
PUBLICATION FORM (JANUARY 2013 REVISION)**

Project Name: Walgreens Kīhei

Island: Maui

District: Makawao

TMK: (2) 3-9-008:016; (2) 3-9-007:037, (2) 3-9-007:038, (2) 3-9-007:039, (2) 3-9-007:040

Permits: Change in Zoning, Special Management Area Use Permit, National Pollutant Discharge Elimination System Permit, Special Flood Hazard Area Development Permit, Building Permits

Approving Agency:

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

Contact: Ann Cua/Candace Thackerson; Phone: (808) 270-7735

Applicant:

Walgreen of Maui, Inc. 106 Wilmot Rd., MS#1620, Deerfield, Illinois 60015

Contact: Lawrence Adler; Phone; (847) 315-6811

Consultant:

PBR Hawaii & Associates, Inc., 1001 Bishop Street, Suite 650, Honolulu, HI 96813

Contact: Kelii Kapali; Phone: (808) 521-5631; Fax (808) 523-1402

Status (check one only):

- DEA-AFNSI** Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov; a 30-day comment period ensues upon publication in the periodic bulletin.
- FEA-FONSI** Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov; no comment period ensues upon publication in the periodic bulletin.
- FEA-EISPN** Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov; a 30-day consultation period ensues upon publication in the periodic bulletin.
- Act 172-12 EISPN** Submit the approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov. NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
- DEIS** The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
- FEIS** The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- Section 11-200-23 Determination** The approving agency simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.
- Statutory hammer Acceptance** The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.
- Section 11-200-27 Determination** The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.
- Withdrawal (explain)**

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

Walgreen of Maui, Inc. proposes to build a new Walgreens store in Kīhei (“Walgreens Kīhei”) on an approximately two-acre site located at the southwest corner of South Kīhei Road and Nohokai Street. Other site improvements will include parking, widening South Kīhei Road and Nohokai Street, and drainage improvements. The proposed use will require a change in zoning from R-3 Residential to B-2 Community Business for four of the five parcels which comprise the site (TMKs (2) 3-9-007:037, 038, 039, 040). All of the properties are in the Special Management Area (SMA), therefore an SMA Use Permit is being sought.

Walgreens Kīhei is an infill retail development responding to current retail and consumer demand. A retail and pharmaceutical store is proposed to support existing and emerging Kīhei population. The Site is contiguous to another commercial property and the immediate vicinity is developed with retail commercial uses along both sides of South Kīhei Road.

Short-term construction impacts will be mitigated through compliance with County, State, and Federal rules, regulations, permits, and other requirements regarding fugitive dust, community noise control, and non-point source discharges. Long-term impacts are not anticipated with implementation of recommended design and civil engineering mitigation measures.

Walgreens Kīhei Draft Environmental Assessment

In Support of
Special Management Area Permit Application and
Change in Zone Application

Applicant:
Walgreen of Maui, Inc.

Approving Agency:
Maui Planning Department/
Maui Planning Commission

Prepared by:



PBR HAWAII
& ASSOCIATES, INC.



May 2015

WALGREENS KĪHEI
Draft Environmental Assessment

In Support of
Special Management Area Permit Application
and
Change In Zoning Application

Applicant:
Walgreen of Maui, Inc.

Approving Agency:
Maui Planning Department/
Maui Planning Commission

Prepared by:



1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

May 2015

SUMMARY

Project Name:	Walgreens Kīhei
Location:	Kīhei, Maui, Hawai‘i
Judicial District:	Makawao
Applicant:	Walgreen of Maui, Inc.
Tax Map Key (TMK):	TMK (2) 3-9-008:016 TMK (2) 3-9-007:037, 038, 039, 040
Recorder Fee Owner:	Stinson Associates (TMK (2) 3-9-008:016) Waisco Properties (TMK (2) 3-9-008:016; (2) 3-9-007:037, 038, 039, 040)
Land Area (the Site):	Approximately 2 acres
Existing Use:	Open-air market place, vacant land
Proposed Action:	Walgreen of Maui, Inc. proposes to build a new approximately 14,550 square foot Walgreens store in Kīhei. Access will be from South Kīhei Road and Nohokai Street and a driveway connection to the adjacent McDonalds parking lot. Other site improvements include parking, widening South Kīhei Road and Nohokai Street, and drainage improvements.
Approving Agency:	County of Maui, Planning Department 250 South High Street Wailuku, Hawaii 96793 Contact: Ann Cua/Candace Thackerson (270-7735)
Current	
Land Use Designations:	<i>State Land Use:</i> Urban <i>County Zoning:</i> B-2 (Community Business) and R-3 (Residential) <i>Kīhei-Mākena Community Plan:</i> B (Commercial) <i>Special Management Area (SMA):</i> Within SMA
Major Approvals Required:	Change in Zoning Special Management Area Use Permit Special Flood Hazard Area Development Permit NPDES Permit Grading/Building Permit Subdivision/Consolidation Approval Work on County Highway Permit

Alternatives

Considered:

Four alternatives were considered:

- No action: The existing properties would remain largely open and covered with sparse vegetation and gravel.
- Residential Build Out of R-3 Lots
- Business Complex Alternative
- Alternate Design

Potential Impacts and

Mitigation Measures:

- Short-term construction impacts to air quality, noise, solid waste generation, storm water quality/quantity are anticipated. Walgreens Kīhei will address these impacts through compliance with County, State, and Federal rules, regulations, permit, and variance requirements regarding fugitive dust, community noise control, and non-point source discharges. In addition, best management practices will be implemented which include structural and non-structural controls designed to inhibit run-off, erosion, and fugitive dust.
- Long-term potential impacts to storm water quality/quantity are not anticipated with implementation of recommended design and civil engineering mitigation measures. To address storm water quality/quantity issues, mitigation measures will include a retention basin and “Green Streets” drainage features to capture additional runoff as a result of the additional non-pervious surface.

Anticipated

Determination:

Anticipated Finding of No Significant Impact (AFONSI)

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ACRONYMS

ALISH	Agricultural Lands of Importance
CDUA	Conservation District Use Permit
CWDA	Critical Wastewater Disposal Area
CWRM	Commission of Water Resource Management
DPR	City and County of Honolulu, Department of Parks and Recreation
DLNR	State of Hawai‘i Department of Land & Natural Resources
DOH	State of Hawai‘i Department of Health
DOFAW	Division of Forestry and Wildlife
EA	Environmental Assessment
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FEIS	Final Environmental Impact Statement
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
HAR	Hawai‘i Administrative Rules
HECO	Hawaiian Electric Company
HRS	Hawai‘i Revised Statutes
HTCO	Hawaiian Telecom Company
LSB	University of Hawai‘i Land Study Bureau
LUO	Land Use Ordinance
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OEQC	State of Hawai‘i, Office of Environmental Quality Control
PUC	Primary Urban Center
SHPD	State Historic Preservation Division
SLUD	State Land Use District
SPCSC	State Public Charter School Commission
TMK	Tax Map Key
USFWS	United States Fish and Wildlife Service

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1 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with Chapter 343, Hawai‘i Revised Statutes (HRS) for the Walgreens Kīhei. This EA also serves as the main review document for the Special Management Area Use Permit and Change in Zoning applications submitted to the County of Maui Department of Planning concurrent with this EA. As such this EA contains information in satisfaction of the requirements under: 1) Title 11; Chapter 200, Hawai‘i Administrative Rules (HAR) for an EA; 2) Title 19 of the Maui County Code, for a change in zoning; and 3) Title MC-12, Subtitle 02, Chapter 202, for a Special Management Area Use Permit.

1.1 LANDOWNER

Stinson Associates is the recorded fee owner of TMK (2) 3-9-008:016 and WAISCO Properties is the recorded fee owner of TMK (2) 3-9-008:016; (2) 3-9-007:037; (2) 3-9-007:038; (2) 3-9-007:039; and (2) 3-9-007:040. Walgreen of Maui, Inc. intends to purchase the properties from Stinson Associates and WAISCO Properties on the condition, among others, that it can change the zoning of the WAISCO Properties to commercial, consolidate and subdivide, and obtain a Special Management Area permit to develop and construct a building and operate a Walgreens retail store on the property.

1.2 APPLICANT

The applicant is Walgreen of Maui, Inc.

Contact: Walgreen of Maui, Inc.
ATTN: Lawrence Adler
106 Wilmot Rd., MS #1620
Deerfield, Illinois 60015
Phone: (847) 315-6811

1.3 PLANNING CONSULTANT & AGENT

PBR HAWAII is Walgreen of Maui, Inc.’s planning consultant and agent for this environmental assessment and the Special Management Area Use Permit and Change in Zoning applications submitted to the County of Maui Department of Planning concurrent with this EA.

Contact: PBR HAWAII & Associates, Inc.
ATTN: Keli‘i Kapali, Planner
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96720-4224
Phone: (808) 521-5631
Fax: (808) 523-1402

1.4 APPROVING AGENCY

The Maui Planning Department/Maui Planning Commission is the EA approving agency.

Contact: County of Maui, Planning Department
250 South High Street
Wailuku, Hawai‘i 96793
Contact: Ann Cua/Candace Thackerson
Phone: (808) 270-7735
Fax: (808) 270-7634

1.5 COMPLIANCE WITH STATE OF HAWAI‘I ENVIRONMENTAL LAWS

Preparation of this document is in accordance with the provisions of Chapter 343, HRS and Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR) pertaining to Environmental Impact Statements. Section 343-5, HRS establishes nine actions that “trigger” compliance and require the need for either an EA or an Environmental Impact Statement (EIS). The use of State or County lands is one of these “triggers.” Because Walgreens will widen South Kīhei Road and Nohokai Street (both County roadways) in front of the Site as part of the development of Walgreens Kīhei, the preparation of an Environmental Assessment is required.

1.6 STUDIES CONTRIBUTING TO THIS ENVIRONMENTAL ASSESSMENT

The information contained in this report has been developed from site visits, generally available information regarding the characteristics of the Site and surrounding areas, and technical studies. Technical studies are provided as appendices to this EA. These studies include:

- Flora and Fauna Surveys
- Archaeological Assessment
- Cultural Impact Assessment
- Traffic Impact Analysis Report
- Preliminary Engineering Report/Drainage Report

2 WALGREENS KĪHEI DESCRIPTION

2.1 BACKGROUND INFORMATION

2.1.1 Location and Property Description

The proposed site for the Walgreen’s store in Kīhei (Walgreens Kīhei) is located at the southwest corner of South Kīhei Road and Nohokai Street (Figure 1). The approximately 2-acre site is identified as TMKs 3-9-007:037; 3-9-007:038; 3-9-007:039; 3-9-007:040; and 3-9-008:016 (herein referred to as the “Site”) in Kīhei, Maui (Figure 2).

Kīhei is located along the south coast of Maui and includes single- and multi-family homes, commercial shopping centers, resorts, and retail businesses. The Site is boarded by South Kīhei Road to the east, McDonald’s Restaurant to the south, single-family home lots to the east, and Nohokai Street to the north (Figure 3).

The Site is undeveloped with sparse vegetative coverage consisting of a few trees and large open spaces covered with gravel. A portion of the Site is used to host a daily open air market. Gravel parking is provided with unmarked stalls (Figure 4).

Elevations range from approximately three to five feet above mean sea level, with average slope of approximately three percent in an east-west, *ma uka* to *ma kai* direction.

Vehicle access to the Site is from South Kīhei Road and Nohokai Street (see Figure 3).

2.1.2 Existing Land Use Designations

Current land use designations for the Walgreens Kīhei are:

- State Land Use: Urban (Figure 5)
- County Zoning: B-2 (Community Business) (TMK 3-9-008:016) and R-3 (Residential) (TMKs (2) 3-9-007: 037, 038, 039, 040)
- Kīhei-Mākena Community Plan: B (Commercial) (Figure 6)
- Special Management Area (SMA): Within SMA (Figure 7)

2.1.3 Surrounding Uses

The immediate vicinity is developed with retail commercial uses along both sides of South Kīhei Road, and residential development of low and medium density east and west of the Lipoa Business District, one of four commercial clusters within Kīhei. Adjacent properties support a mixture of commercial and residential uses. A McDonald’s Restaurant is located directly to the south and further south is located Azeka-I Shopping Complex. To the east is Azeka II. Immediately to the west are single-family homes. Immediately to the north are large residential lots and vacant land.

<u>North:</u>	Zoning: R-3 (Residential District) Community Plan: Business/Commercial; Single-Family Existing Uses: Single-family residences and undeveloped parcels.
<u>South:</u>	Zoning: B-2 (Community Business District) Community Plan: Business/Commercial Existing Uses: McDonald’s Restaurant
<u>East:</u>	Zoning: R-3 (Residential District); B-2 (Community Business District) Community Plan: Business/Commercial Existing uses: Mango orchard, roadside produce market and a retail commercial complex anchored by Long’s Drugs.
<u>West:</u>	Zoning: R-3 (Residential District) Community Plan: Single-Family Existing Uses: Abutting the Site’s western boundary are residential lots, typically developed with two single-family dwellings per lot, having access from Nohokai Street.

2.1.4 Regional Land Use History

Kīhei is located in the *moku* (district) of Kula. For the most part, the coastal area was fairly sparsely occupied by people who primarily concentrated on the exploitation of marine resources (Xamanek Researches, LLC, 2005). Along the coastline were a number of fishponds, most notably Kalepolepo, Waiohuli kai, and Keokea kai. These ponds were some of the most important royal fishponds on Maui and were reportedly rebuilt at least three times over the centuries by various ruling chiefs. While the original date of construction is not known, traditional mo‘olelo suggest continued use beginning in the middle of the 1500s and continuing through the late 19th century.

During the 1800s, whaling ships anchoring off Maui shores created a substantial market for produce such as sweet and Irish potatoes, which grew well in the Kula region. Captain John Halstead established a trading post known locally as the Koa House in 1849 in the village of Kalepolepo to take advantage of this commercial activity. Another economic activity in the Kula District consisted of cattle ranching, which had become a booming enterprise by the 1880s. Sugar cane was also introduced to Maui and was grown on the plains above Kīhei until the 1960s.

Prior to the 1970s, Kīhei was a small coastal village with fewer than 3,000 residents and limited development. By 1980, the population had more than doubled to about 7,000 people as substantial commercial space and resort units were built. The population boom continued on through the next two decades where South Maui is considered one of the fastest growing regions in the State. Today, Kīhei is a popular tourist destination with its many resorts and vacation properties.

2.1.5 Detailed Land Use History

In general, the area in the vicinity of the Site was in agricultural use from about 1900 to through mid-century. According to historic aerial photographs, the area in the vicinity of the Site was developed for residential use by the late 1940s. A 1949 aerial photograph shows a structure on TMK 3-9-008:016 that most likely was a house. The same structure remains visible in aerial photos through the late 1980s. The 1949 aerial photograph also shows a second smaller structure west of the larger structure.

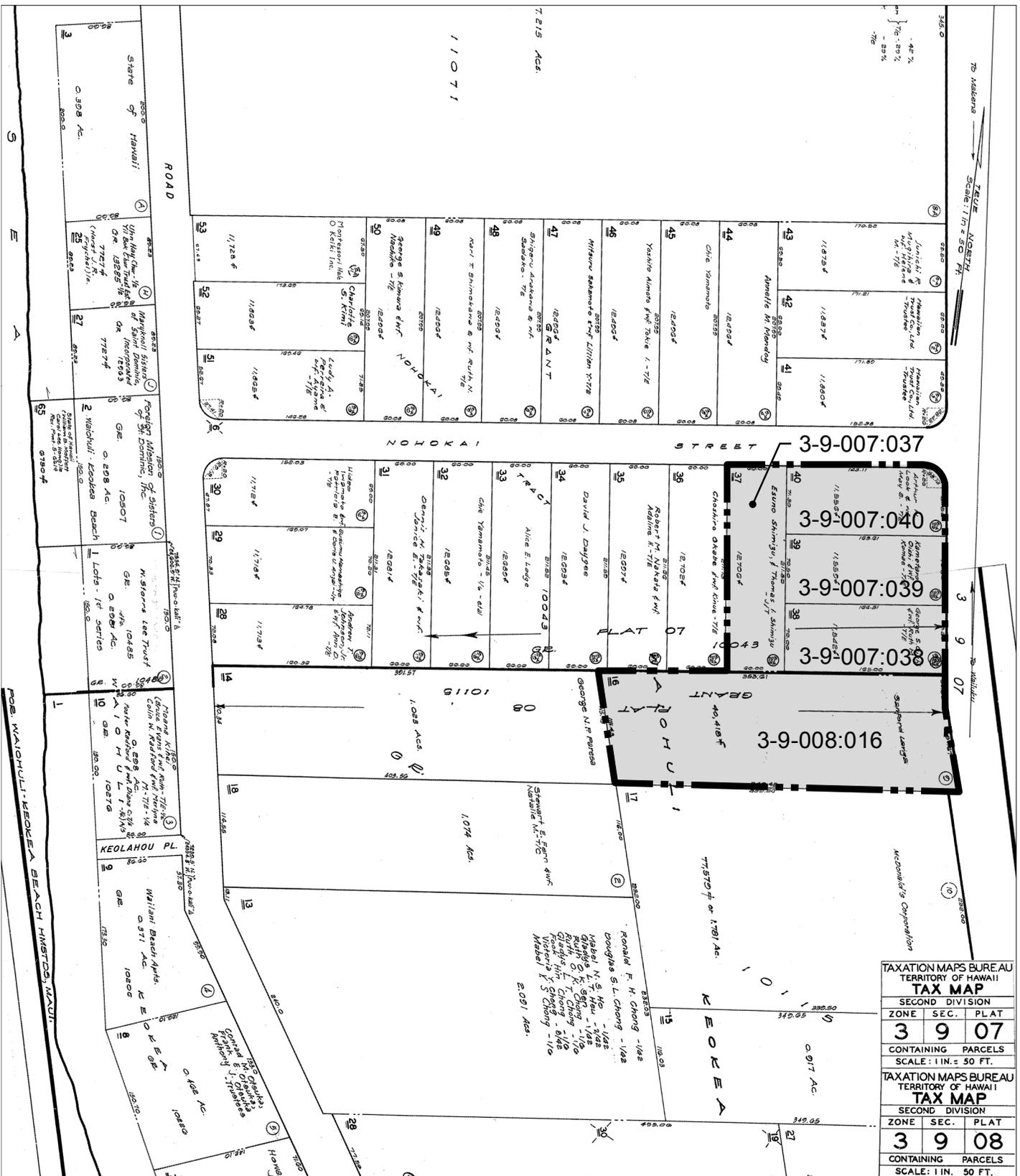
Since the mid-1980s previous plans for the Site, or a portion of the Site, have included a fast-food, drive-in restaurant and the Stinson & R.C. Families' Kihei Business Complex, a retail, restaurant, and office complex. Currently there is an open air market on TMK 3-9-008:016 and a gravel parking lot on the remainder of the parcels.

In 1987 the zoning of TMK 3-9-008:016 was changed from R-3 Residential to B-2 Community Business District. A fast-food, drive-in restaurant was proposed at the time and conditions of the change in zoning ordinance (Ordinance 1644-87) included prohibiting restaurant and/or food activities or operations on the rear, west/makai portion of the parcel.

The restaurant was never built and in 2001, the owner of TMK 3-9-008:016 and the owner of adjacent TMKs 3-9-007:037; 3-9-007:038; 3-9-007:039; 3-9-007:040, proposed the Stinson & R.C. Families' Kihei Business Complex, which would have included approximately 24,000 square feet of retail, restaurant, and office space with 88 parking stalls. Because TMKs 3-9-007:037; 3-9-007:038; 3-9-007:039; and 3-9-007:040 are zoned R-3 Residential, a change in zoning application was submitted along with request to amend two conditions from the 1987 change in zoning for TMK 3-9-008:016. An application for a SMA Use Permit was also submitted and draft environmental assessment (EA) was prepared. For unknown reasons the landowners never completed processing the change in zoning and SMA Use Permit applications, a final EA was never prepared, and the Stinson & R.C. Families' Kihei Business Complex was never built.

In 2005 a SMA Minor permit was granted for TMK 3-9-008:016 for the operation of the open air market (SMX2004/0543)(SM2 2005/0138). Parking for the market is provided on TMKs 3-9-007:037; 3-9-007:038; 3-9-007:039; and 3-9-007:040.

There is one known violation regarding the Site. According to letters from the Department of the Army Corps of Engineers, unpermitted fill occurred on the Site, resulting in the permanent loss of wetlands. Based on available letters from the Department of the Army and other information, this violation likely occurred in the early 1990s but was mitigated several years later through wetland enhancement on a separate property purchased specifically for the enhancement. A conservation easement was recorded for the enhanced property and in 2006, the Department of the Army Corps of Engineers stated that the wetland enhancement satisfied the required



TAXATION MAPS BUREAU		
TERRITORY OF HAWAII		
TAX MAP		
SECOND DIVISION		
ZONE	SEC.	PLAT
3	9	07
CONTAINING PARCELS		
SCALE: 1 IN. = 50 FT.		
TAXATION MAPS BUREAU		
TERRITORY OF HAWAII		
TAX MAP		
SECOND DIVISION		
ZONE	SEC.	PLAT
3	9	08
CONTAINING PARCELS		
SCALE: 1 IN. 50 FT.		

DATE: 12/22/2014

LEGEND
 Site

FIGURE 2:

Tax Map Key

KĪHEI WALGREENS

Walgreen of Maui, Inc. North
 Island of Maui

 Linear Scale (feet)
 0 35 70 140

 PBR HAWAII & ASSOCIATES, INC.

Source: County of Maui, Taxation Map Bureau.

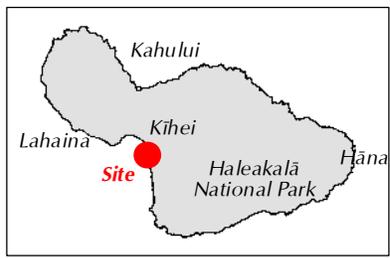
Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



DATE: 11/25/2014

LEGEND

-  Site
-  TMK Boundary (2013)

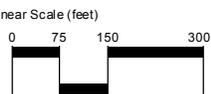


**FIGURE 3:
Aerial Map**

WALGREENS KĪHEI

Walgreen of Maui, Inc. Island of Maui

North 

Linear Scale (feet) 

 PBR HAWAII
MASSER, ADER, INC.

Source: County of Maui (May, 2013); ESRI (2014)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



1. View of the Site at the intersection of South Kihei Road and Nohokai Street



2. Nohokai Street looking west



3. View from Nohokai Street looking southeast toward Haleakalā



4. Gravel parking within the Site



5. Open-air market



6. View towards McDonald's



7. View of the Site from South Kihei Road looking northwest

FIGURE 4 :
Site Photos

WALGREENS KIHEI

Walgreen of Maui, Inc.

Island of Maui

DATE PHOTOS TAKEN:
June 20, 2014





DATE: 3/27/2015

LEGEND



Site

District



U - Urban

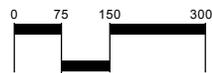
FIGURE 5:
State Land Use Districts

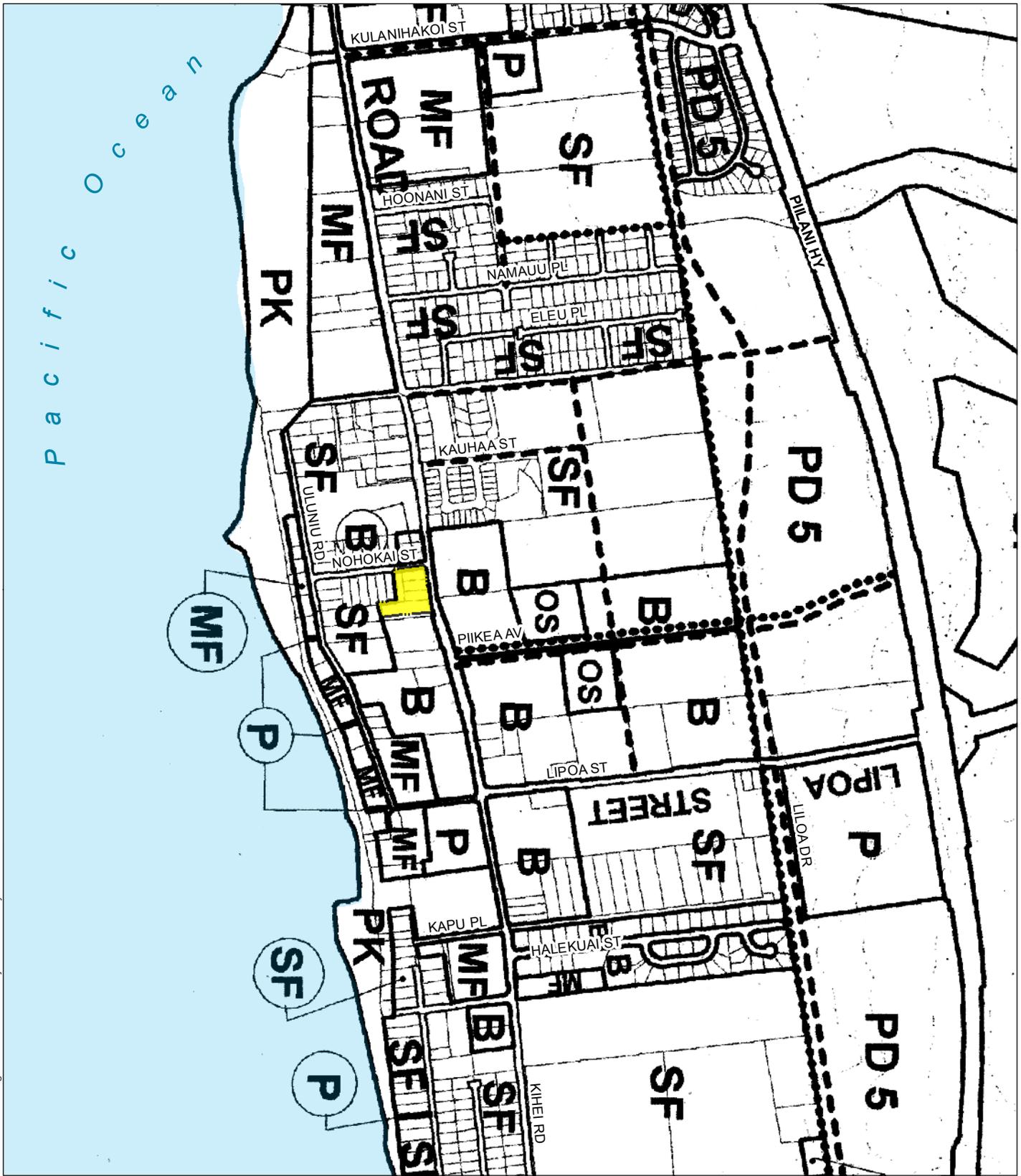
WALGREENS KĪHEI

Walgreen of Maui, Inc. Island of Maui



Linear Scale (feet)





DATE: 3/27/2015

LEGEND

Site

- Roadway Plan
- Bikeway Plan
- Single Family
- Multi-family
- Hotel
- Commercial
- Agriculture

- Project District
- Open Space
- Conservation
- Public/Quasi-public
- Park
- Park/Golf Course

FIGURE 6:
Kihel - Makena Community Plan
Land Use Map

WALGREENS KĪHEI

Walgreen of Maui, Inc. Island of Maui

North

Linear Scale (feet)
 0 250 500 1,000



DATE: 3/27/2015

LEGEND

-  Site
-  Within Special Management Area (SMA)

FIGURE 7:
Special Management Area

WALGREENS KĪHEI

Walgreen of Maui, Inc. Island of Maui

North 

Linear Scale (feet)
0 375 750 1,500 



PBR HAWAII
MASSIVE ADPS INC

Source: County of Maui (2007 and May, 2013).
Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary Interpretations or other spatial analysis.

mitigation for the unauthorized fill of wetlands on the Site and that the violation was considered resolved.

2.1.6 Walgreens

As the nation’s largest drugstore chain Walgreens’ vision is to be the first choice in health and daily living for everyone in America, and beyond. Each day, Walgreens provides more than six million customers the most convenient, multichannel access to consumer goods and services and trusted, cost-effective pharmacy, health and wellness services, and advice in communities across America.

Walgreens scope of pharmacy services includes retail, specialty, infusion, medical facility and mail service, along with respiratory services. These services improve health outcomes and lower costs for payers including employers, managed care organizations, health systems, pharmacy benefit managers, and the public.

The company operates 8,200 drugstores in all 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands, including three stores and two specialty pharmacy locations on Maui.

2.2 WALGREENS KĪHEI DESCRIPTION

2.2.1 Proposed Action

Walgreen of Maui, Inc. proposes to build a new Walgreens store in Kīhei (“Walgreens Kīhei”) on an approximately two-acre site located at the southwest corner of South Kīhei Road and Nohokai Street. The proposed use will require a change in zoning the from R-3 Residential to B-2 Community Business for four of the parcels which comprise the Site (TMKs (2) 3-9-007:037, 038, 039, 040. This change in zoning process may also include amending unilateral conditions pertaining to TMK (2) 3-9-8: 016 which is zoned B-2 Community Business. All of the properties are in the SMA, therefore an SMA Use Permit is being sought.

The Walgreens Store will be approximately 14,550 square feet in size, of which approximately 12,050 square feet will be retail space and approximately 2,500 square feet will be storage area. A pharmacy drive through window is also proposed. The structure will be single story with finishes comprised of synthetic plaster, textured concrete masonry, stone veneer, and sloped metal roofing and awnings. The building height will be approximately 22 feet with some architectural features at about 24 feet and the main entrance copula feature at 35 feet. These heights are well below the maximum height of 50 feet allowed in the B-2 Community Business district (zone). Figure 8 contains the site plan. Figure 9 contains architectural building elevation drawings showing the style and character of the store. Figure 10 contains 3D drawings from various perspectives.

Access will be from South Kīhei Road, Nohokai Street, and an interconnection from the adjacent McDonald's parking lot. The primary access will be provided from South Kihei Road, approximately midway between the McDonald's driveway and Nohokai Street. All traffic movements are expected to be will be allowed into and out of this driveway. The second access will be along the south side of Nohokai Street at the west end of the Site. All traffic movements will be allowed into this driveway; however only right turns will be allowed out. The interconnection between Walgreens and McDonald's is expected to reduce some vehicle movements to/from South Kihei Road and Nohokai Street for customers patronizing either business.

Walgreens Kīhei will have parking stalls and loading spaces meeting or exceeding the requirements for parking and loading under Chapter 19.36A.010, Maui County Code.

Other improvements include widening of South Kīhei Road and Nohokai Street and drainage improvements (see below).

Architectural Design

The store design is compatible with retail and commercial buildings found nearby, along South Kīhei Road and elsewhere on Maui that reflect a unique island style. Distinctive architectural elements include:

- A hipped-roof copula feature at the store entrance;
- Vertical and horizontal articulation providing a pleasing and softening character
- Extensive windows extending from store entrance to create visual interest;
- Pitched awnings over the windows and elsewhere to provide shade and invoke a plantation style;
- Varied exterior surfaces, materials, and textures.
- A unique, fresh, color palate appropriate to the area and
- A building height consistent with, or lower than, many other Kīhei commercial buildings.

Landscape Design

Landscaping will complement the building design, screen specific areas, and provide visual relief. Key landscape features include:

- Palm trees, shade trees, and appropriate hedges and ground cover plants in the parking lot along South Kīhei Road and Nohokai Street, and at the rear of the property;
- A wide meandering sidewalk along South Kīhei Road and Nohokai Street;
- "Green Streets" features such as storm water planters with permeable drainage rock and plants to slow, filter, and cleanse stormwater; and
- Dense trees and plants and fences or walls along the rear of the property to screen the store and parking lot from neighboring residential properties.

Figure 11 contains the conceptual landscape plan. All landscaping will be in compliance with Section 19.36A.070, MCC and the Maui County Planning Plan.

Site Improvements

The building will be located near the center of the Site and elevated above the designated base flood elevation. The parking lot will be constructed close to the elevation of the existing ground, and approximately 20,000 cubic feet of earth will be excavated from the southwest corner of the site to create a retention basin. Final grading will direct storm water runoff from the building and parking lot to drain to the retention basin. The capacity of the retention basin will be sufficiently large to capture and hold runoff generated by the developed Site and will also exceed the minimum storage capacity required by the Maui County Dept. of Public Works.

Because there is no underground County storm drainage system present along South Kihei Road and Nohokai Street, a “Green Streets” approach will be employed along these streets in front of the Site to dispose of runoff at its source. Runoff from the widened street pavement areas will be directed through curb openings into stormwater planters constructed along the road shoulders where the stormwater will be held and allowed to percolate into the ground.

Roadway Improvements

Roadway improvements will include vehicle capacity and bicycle and pedestrian facility upgrades along South Kīhei Road and Nohokai Street in front of the Site (see Figures 12a and 12b) in compliance with both the Maui County Department of Public Works’ roadway standards for commercial uses and Maui County’s “Complete Streets” bike and pedestrian facilities policy. More specifically, these improvements will include:

- Widening South Kihei Road in front of the Site by 12 feet to:
 - Increase the public right-of-way (the widened area will be dedicated to the County);
 - Provide a median along South Kihei Road to accommodate a two-way left turn lane up to Nohokai Street; this median will allow for left turns into the Walgreens driveway and onto Nohokai Street;
 - Provide bike lanes on both sides of South Kihei Road; and
 - Provide curbs, sidewalks, and landscaped area in front of Site.
- Widening Nohokai Street in front of the Site by 12 feet to:
 - Increase the public right-of-way (the widened area will be dedicated to the County);
 - Provide separate left and right turn lanes for turns onto South Kihei Road; and
 - Provide curbs, sidewalks, and landscaped area in front of the Site.
- New crosswalks at the South Kīhei Road/Nohokai Street corner extending across South Kīhei Road and Nohokai Street.



12' Additional Public Right of Way / Road Widening

Nohokai St.

Right Out Only

New Left Turn Lane

New Crosswalks

New Bikelanes

Screening Fence

Walgreens

12' Additional Public Right of Way / Road Widening

New Median For Left Turns

"Green Street" Stormwater Planters

Stormwater Retention Basin

Internal Connection

McDonalds

South Kihei Rd.

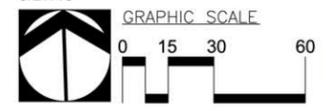
Kihei Center (Longs)

FIGURE 8
SITE PLAN

WALGREENS KĪHEI

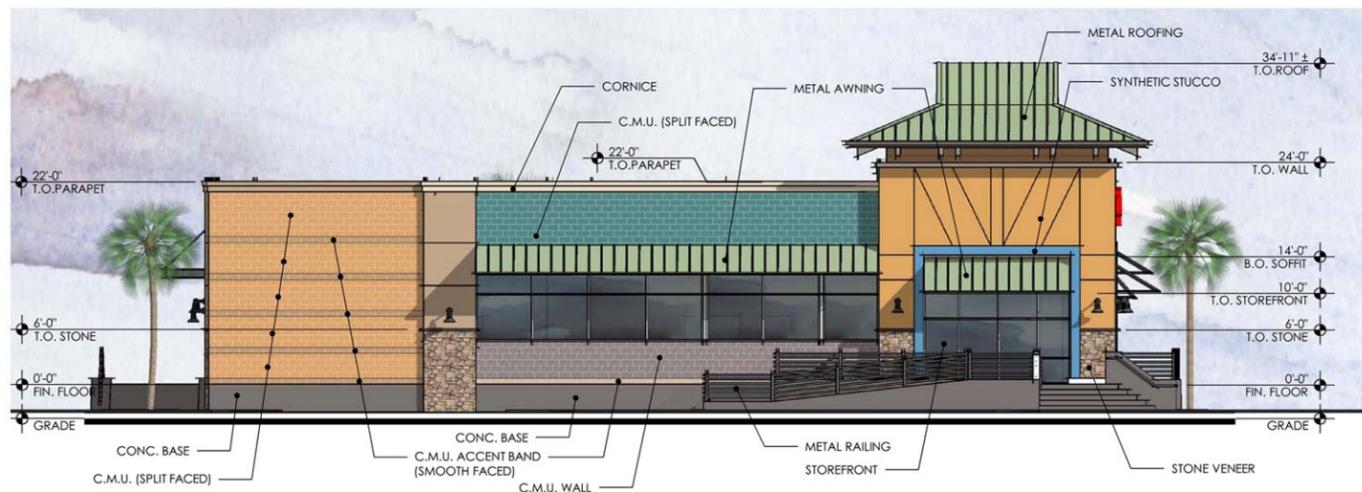
Walgreens Co.
3/27/15

Island of Maui

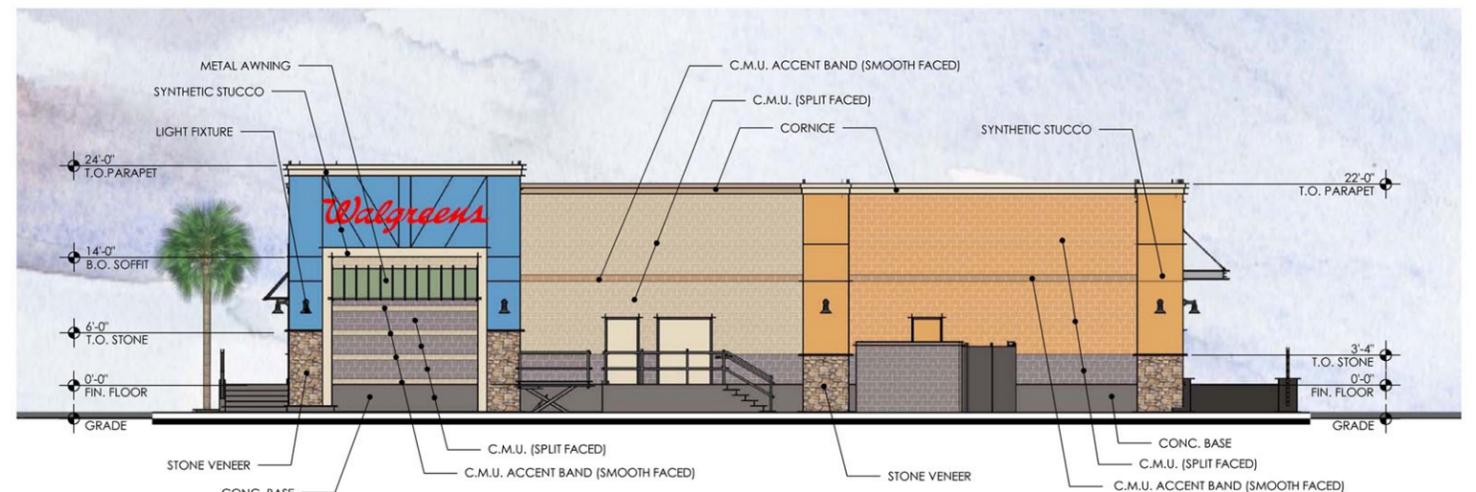




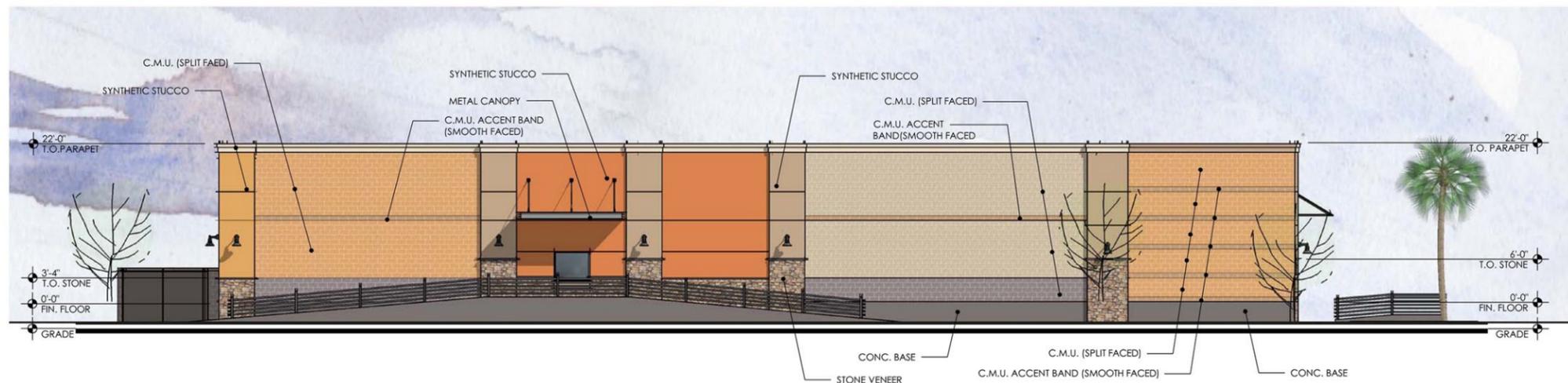
EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION



WEST ELEVATION

FIGURE 9
ELEVATION DRAWINGS

WALGREENS KĪHEI

Walgreens Co. 3/27/15 Island of Maui



BSAA
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Lake Oswego, Oregon 97035
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E bsaa@bsaarch.com





VIEW 1



VIEW 2



VIEW 3



VIEW 4



FIGURE 10
RENDERING DRAWINGS

WALGREENS KĪHEI

Walgreens Co.
3/27/15

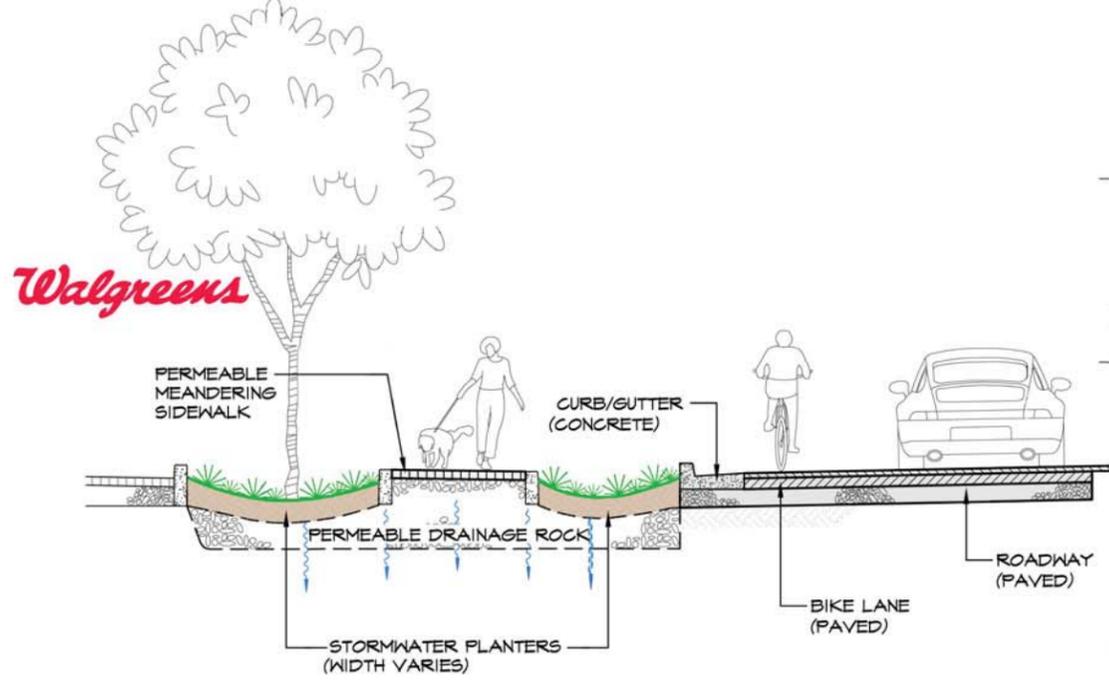
Island of Maui



WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS



PBR HAWAII
& ASSOCIATES, INC.



SECTION A: STORMWATER PLANTERS (TYPICAL)
NOT TO SCALE

NOTE: PLANTS WITH (*)
ARE APPROVED BY MAUI
COUNTY PLANTING PLAN.



- TREES SUCH AS:
- HONG KONG ORCHID (*)
 - SHOWER TREE (*)
 - FERN TREE (*)
 - PINK TRUMPET (*)
 - KOLOMONA
 - PLUMERIA

- TURF SUCH AS:
- SEASHORE PASPALUM (*)
 - ST. AUGUSTINE (*)

- TREES SUCH AS:
- HONG KONG ORCHID (*)
 - SHOWER TREE (*)
 - FERN TREE (*)
 - PINK TRUMPET (*)
 - KOLOMONA
 - PLUMERIA

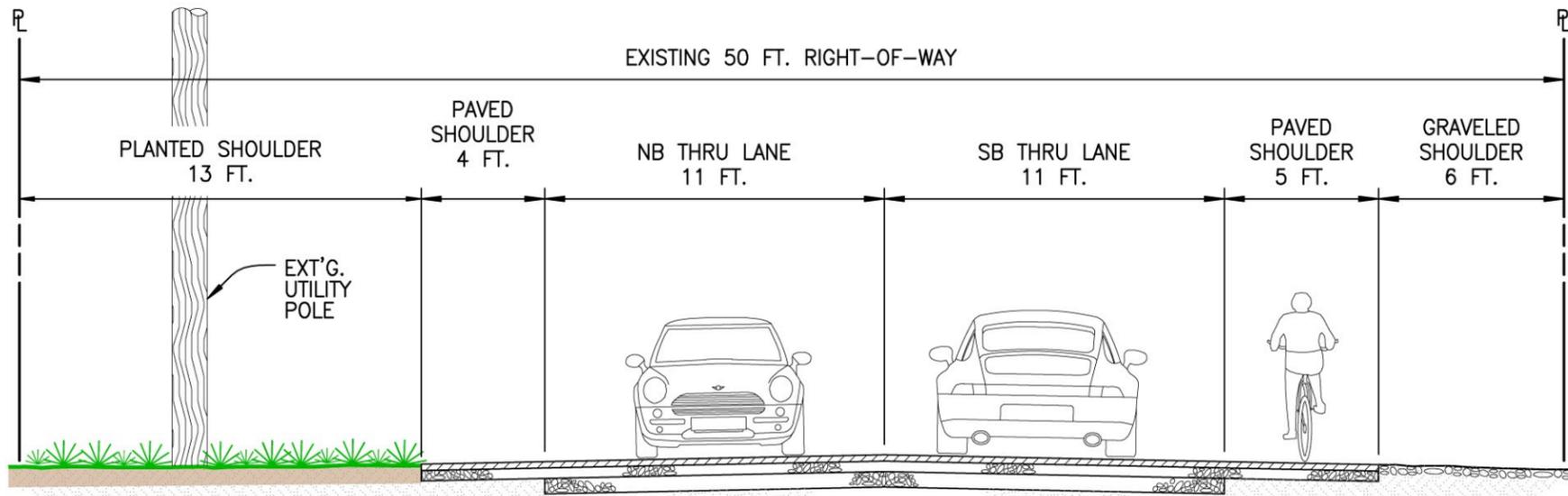
- SCREENING SHRUBS SUCH AS:
- OLEANDER (*)
 - MOCK ORANGE (*)
 - NAUPAKA (*)

- SHRUBS SUCH AS:
- HINAHINA (*)
 - ĀKIA (*)
 - TI (*)
 - NANU (*)
 - HIBISCUS (*)

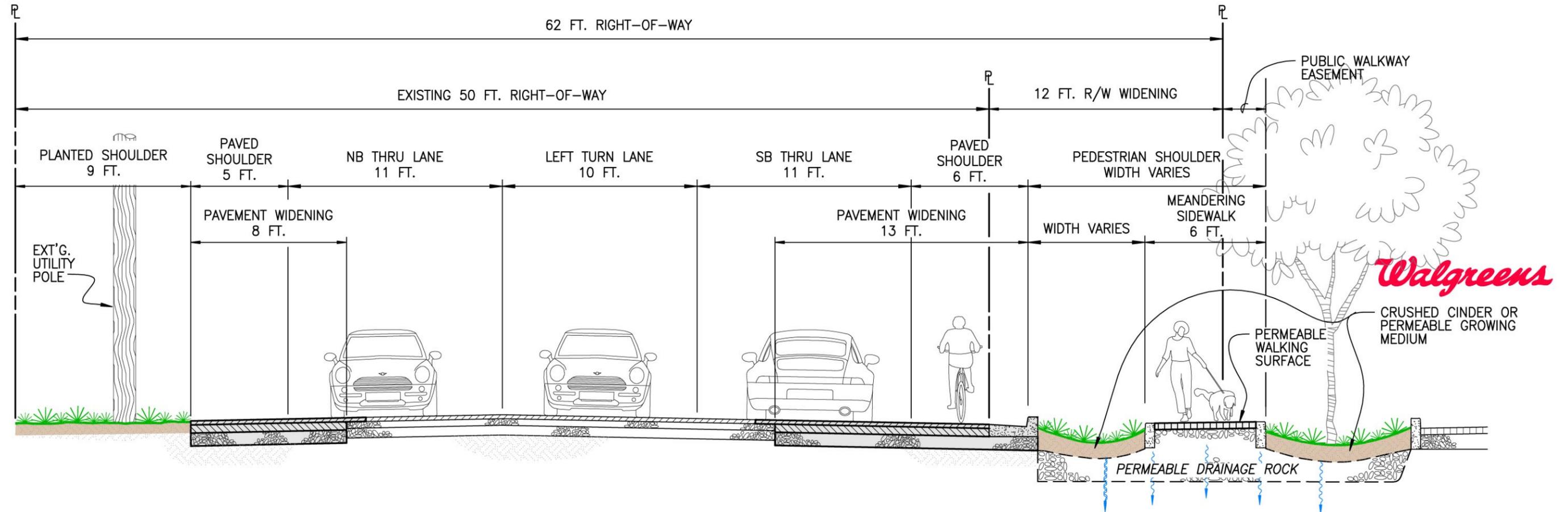
- GROUNDCOVERS SUCH AS:
- NEHE (*)
 - LAUAE FERN (*)
 - ILIMA PAPA (*)
 - ILIEE (*)
 - PĀUOHI'IAKA
 - PŌHINAHINA (*)

FIGURE 11
CONCEPTUAL LANDSCAPE PLAN

WALGREENS KĪHEI



EXISTING SOUTH KIHEI ROAD SECTION



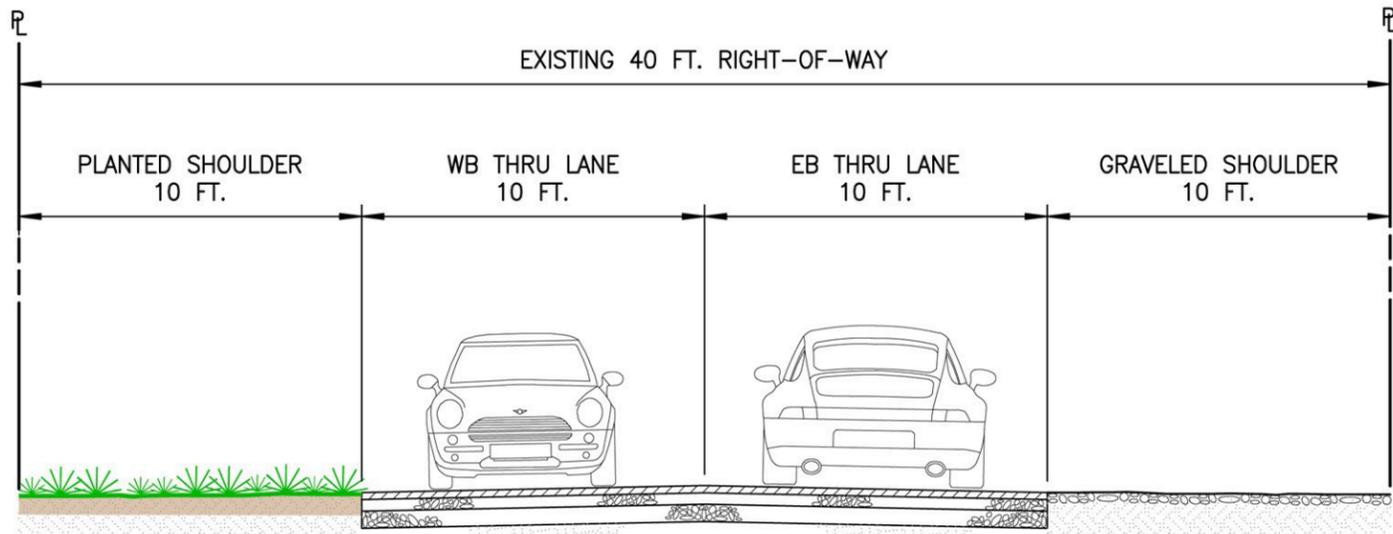
PROPOSED SOUTH KIHEI ROAD SECTION

FIGURE 12a
SECTION DRAWINGS

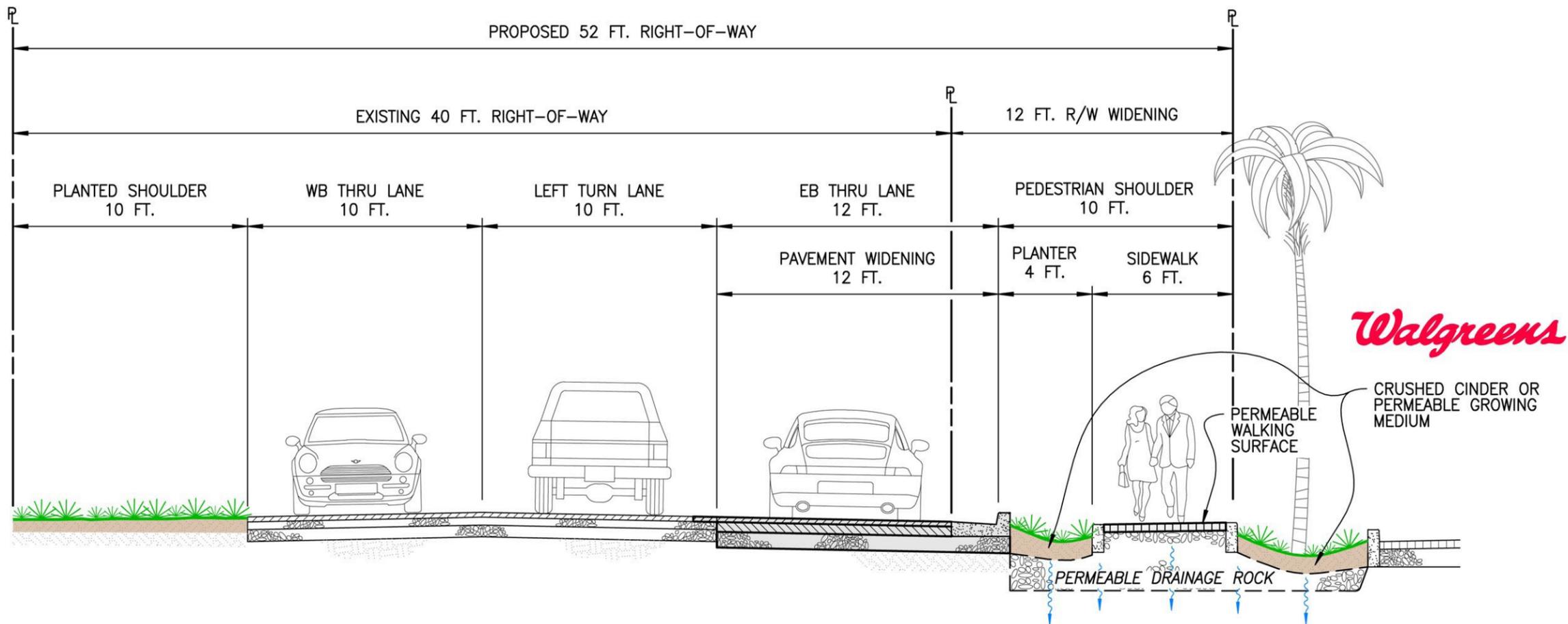
WALGREENS KĪHEI

Walgreens Co. 3/27/15 Island of Maui





EXISTING NOHOKAI STREET SECTION



PROPOSED NOHOKAI STREET SECTION

FIGURE 12b
SECTION DRAWINGS

WALGREENS KĪHEI

Walgreens Co.
3/27/15

Island of Maui



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ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS



PBR HAWAII
& ASSOCIATES, INC.

Operations and Management

The proposed hours of operation for the Store are 7:00 AM to 12 midnight, seven days a week. Pharmacy hours (including the pharmacy drive through window) are expected to be 8 AM to 10 PM Monday through Friday and 9 AM to 6 PM on Saturdays and Sundays. The Store will employ approximately 30 employees. Walgreens Kīhei will maintain the Site and landscaping. The Store will offer a full range of sundry and pharmaceutical products.

2.2.2 Purpose and Need

The purpose of Walgreens Kīhei is to develop the Site into its highest and best use. Walgreens Kīhei is an infill retail development responding to current retail and consumer demand. A retail and pharmaceutical store is proposed to support existing and emerging Kīhei population. The Site is contiguous to another commercial property and the immediate vicinity developed with retail commercial uses along both sides of South Kīhei Road.

The Site was selected because it offers unique attributes that make it highly desirable as a commercially zoned parcel. From the location/function perspective, these attributes include the Site's ease of access to and from South Kīhei Road, proximity to compatible commercial land uses, visibility, and the existence of population densities that are capable of supporting the Store. From a land suitability perspective, the Site offers a favorable lot size, shape, and topography which make it a highly suitable for a Walgreens store.

2.2.3 Statement of Objectives

The objectives of Walgreens Kīhei are to:

- Improve community health and wellness;
- Respond to consumer demand for a Walgreens store in the South Maui region;
- Improve access to quality, affordable retail and health-care products and services;
- Locate the Walgreens Store at:
 - A street corner
 - In close proximity to other commercial uses;
 - Nearby existing residential neighborhoods to foster pedestrian access and community convenience;

2.2.4 Sustainable Planning and Design

In harmony with Walgreens' commitment to improve health and wellness, the design and construction of Walgreens Kīhei will exceed the standards established in the Hawaii State Energy Conservation Code (Chapter 181, Title 13, Hawai'i Administrative Rules) and the Maui County Energy Code (Chapter 16.16A, MCC), both of which are based on the International Energy Conservation Code. Conservation measures of the store will include:

- Light-emitting diode (LED) lighting throughout, including the building interior, building exterior and in the parking lot; all outdoor lights will be shielded in compliance with Chapter 20.35, (Outdoor Lighting), MCC.
- A carefully designed lighting layout designed and engineered to provide a safe environment that maximizes the output of each fixture, thereby minimizing redundant fixtures and their associated energy use;
- Wall insulation with a R-Value more than two times greater than the code-required R-Value;
- Roof insulation with a R-Value at least 10 percent greater than the code-required R-Value
- Low-flow plumbing fixtures to reduce water consumption
- “Green Streets” features such as storm water planters with permeable drainage rock and plants to slow, filter, and cleanse stormwater.

2.2.5 Development Timeline and Preliminary Costs

Construction is expected to commence once plans and permit applications are approved. Walgreens Kīhei is expected to be completed by 2017. The total cost for design and construction is estimated to be approximately \$3 million.

3 DESCRIPTION OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

3.1 CLIMATE

Existing Conditions

Kīhei is situated on the leeward side of Haleakalā, which is generally dry year-round. According to *The Rainfall Atlas of Hawai‘i*, the Site receives an average annual rainfall of approximately 11 inches (Giambelluca, et al., 2013). Seasonal variation in rainfall occurs with higher levels of rainfall during the months of November through April.

Temperatures are typically mild and uniform, with the monthly average temperatures in Kīhei ranging from 72 degrees to 80 degrees Fahrenheit. Trade winds wrapping around Haleakalā vary from 10 to 25 mph which occur approximately 70 percent of the time. Humidity in the area ranges between 70 to 80 percent with higher humidity levels occurring during the winter months.

Potential Impacts and Mitigation Measures

The Walgreens Store is not expected to have a significant impact on the region’s climate, and no mitigation measures are warranted or planned. Modification of the Site’s specific microclimate may occur from the planting of trees and other landscape elements.

The most dominant climatic feature of the site is its exposure to the trade winds. Building orientation is such that the adjacent land downwind may be partially buffered from trade wind exposure, thereby reducing the potential of airborne particles impacting neighboring land uses.

3.2 GEOLOGY AND TOPOGRAPHY

Existing Conditions

Maui was formed by two volcanoes—the older Kahalawai (West Maui) (summit 5,788 feet) and the younger Haleakalā (East Maui) (summit 10,023 feet). The flat isthmus between the two volcanoes was built by lava flows from Haleakalā banking against Kahalawai (Macdonald, Abbott, & Peterson, 1983).

Haleakalā is a broad shield volcano, consisting of an east rift, southwest rift, and north rift zone that radiates from the former summit area. The Site is located along the coastal plains of the southwest rift zone at approximately the 3- to 5-foot elevation.

The general geology of the southwest rift zone is dominated by the Hāna Volcanic lava flows of the Kula Volcanic Series. The Kula Volcanic Series is early Pleistocene in age. Hāna Volcanic lavas are late Pleistocene to recent lava flows, the last of which occurred around 1750. The lava flows are predominantly ‘a‘ā basaltic lavas inter-layered with clinker gravel. Because of the

relatively dry climatic conditions, weathering and erosion of the Kula lava flows have resulted in the formation of only a thin layer of residual clayey and sandy gravelly silts. Because the Hāna lava flows are derived from younger volcanic eruptions than the Kula Series, less weathering and erosion of the surface clinker has taken place in areas with Hāna flows (Macdonald, Abbott, & Peterson, 1983).

Potential Impacts and Mitigation Measures

The Walgreens Store is not expected to significantly impact the topographic nature of the site relative to the surrounding lands; therefore, no mitigation measures are planned. Any grading necessary will be kept to a minimum to maintain the existing natural state as much as possible and to keep adjacent lands undisturbed. All ground-altering activity will be conducted in accordance with Chapter 20.08, MCC (Soil Erosion and Sedimentation Control).

3.3 SOILS

Existing Conditions

Three soil suitability studies prepared for lands in Hawai‘i describe the physical attributes of land and the relative productivity of different land types for agricultural production; these are: 1) the U.S. Department of Agriculture Soil Survey; 2) the University of Hawai‘i Land Study Bureau (LSB) Detailed Land Classification; and 3) the State Department of Agriculture’s Agricultural Lands of Importance to the State of Hawai‘i (ALISH) system. The three soil suitability studies are discussed below.

U.S. Department of Agriculture Soil Survey

According to the *Soil Survey of Island of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*, prepared by the U.S. Department of Agriculture (1972), the soil within the Site is classified as Jaucas sand, saline, 0 to 12 percent slope (JcC) (Figure 13). These soils generally occur near the ocean in areas where the water table is near the surface and salts have accumulated. Jaucas sand is further classified as belonging to Hydrologic Soil Group A-1, which has low runoff potential and high infiltration rates when thoroughly wetted.

Jaucas sand, saline, 0 to 12% slope (JcC) formed in alluvium derived from basic igneous rock in the humid uplands. This soil series consists of well-drained soils and has enough stones to hinder but not prevent cultivation. Permeability is moderate, runoff is slow, and the erosion hazard is slight. The available water capacity is approximately 1.8 inches per foot of soil. This soil is used for sugarcane, truck crops, and pasture. The agricultural capability classification is Iie for both irrigated and nonirrigated crops. Capability classification Iie means these soils are subject to moderate limitations that reduce the choice of plants or that require moderate conservation practices, or both.

Land Study Bureau Detailed Land Classification

The University of Hawai‘i Land Study Bureau (LSB) Detailed Land Classification, Island of O‘ahu, classifies non-urban land by a five-class productivity rating system, which indicates the degree of overall suitability of the land for agricultural use, using the letters A, B, C, D, and E, where “A” represents the highest class of productivity and “E” represents the lowest class of productivity. The Site is classified “E,” meaning that the land is of very poor suitability for agricultural use (Figure 14).

Agricultural Lands of Importance to the State of Hawai‘i

The State of Hawai‘i Department of Agriculture’s Lands of Importance to the State of Hawai‘i (ALISH) system rates agricultural land as “Prime,” “Unique,” or “Other.” The remaining land is not classified. The land of the Site is not classified under the ALISH system. A map of the land classification in the area can be seen in Figure 14.

Potential Impacts and Mitigation Measures

The Walgreens Store will not reduce the inventory of agriculturally significant land. The Site has a soil capability classification of Iie under the U.S. Department of Agriculture Soil Survey, meaning it has moderate limitations that reduce the choice of plants, hinder cultivation, or require moderate conservation practices. The Site is classified as “E” under the LSB classification system and is not classified under the ALISH system, indicating that the Site is not agriculturally significant.

Construction of the Walgreens Store will cause some land disturbance, including removal of existing vegetation (clearing and grubbing) and grading. Impacts to the soils include the potential for soil erosion and the generation of dust during construction. Clearing and grubbing activities will temporarily disturb the soil retention values of the existing vegetation and expose soils to erosional forces. Some wind erosion of soils could occur without a proper watering and re-grassing program. Heavy rainfall could also cause erosion of soils within disturbed areas of land.

All construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control. Appropriate engineering, design, and construction measures will be undertaken to minimize potential erosion due to grading of soils during construction. To minimize potential impacts, necessary grading will be segmented and exposed areas will be immediately grassed or landscaped before commencement of grading in the next phase, in compliance with Chapter 20.08, MCC (Soil Erosion and Sedimentation Control). Measures to control erosion during the site development period may include:

- Minimizing the time of construction;
- Retaining existing ground cover as long as possible;
- Constructing drainage control features early;

- Using temporary area sprinklers in non-active construction areas when ground cover is removed;
- Providing a water truck on site during the construction period to provide for immediate sprinkling, as needed;
- Using temporary berms and cut-off ditches, where needed, for control of erosion;
- Watering graded areas when construction activity for each day has ceased;
- Grassing or planting all cut and fill slopes immediately after grading work has been completed; and
- Installing silt screens, where appropriate.

As typically required for projects on land greater than one acre in size, a National Pollutant Discharge Elimination System (NPDES) Notice of General Permit Coverage for stormwater associated with construction activity will be necessary. Before issuance of a grading permit by the County of Maui, the final erosion control plan and Best Management Practices (BMPs) required for the NPDES permit will be completed and submitted. BMPs to minimize erosion and the discharge of other pollutants may include use of silt fences, sediment traps, and diversion swales. After construction, the establishment of permanent landscaping will provide long-term erosion control.

3.4 IDENTIFICATION OF CHEMICALS AND FERTILIZERS

A Phase 1 Environmental Site Assessment (ESA) of the Site was conducted in August 2013. Subsequent soil testing was conducted in December 2013.

During the course of the Phase I ESA discarded batteries and other solid waste was found on the Site in August 2013. Leaks or stains were not observed from the discarded items, thus it was concluded that the abandonment of these items did not pose a recognized environmental condition. The batteries and other discarded items were subsequently cleaned up in December 2013.

Soil stockpiles (approximately 50 cubic yards of soil) were observed at the north boundary of the Site (fronting Nohokai Street) and appeared to have resulted from fugitive dumping. Subsequent testing of the soil stockpiles found concentrations of some contaminants, but at levels well below the Department of Health Tier I Environmental Action Levels. The testing company concluded that no further studies and/or remediation activities were warranted and that the soils can be reinterred within the Site or disposed of at a municipal landfill; if disposed of at landfill additional testing may be necessary to fulfill the environmental requirements of the landfill operator.

From the late 1940s through 1989 structures were located on TMK 3-9-8: 016. According to the Department of Health, termiticides applied around the foundations of buildings more than two decades old are assumed to be present at levels of environmental concern such that soil testing is



DATE: 3/27/2015

LEGEND



Site



Roads

Soil Classification

BS - Beaches

DL - Dune land

JcC - Jaucas sand, saline, 0-12% slopes

AaB - Alae sandy loam, 3-7% slopes

PsA - Pulehu clay loam, 0-3% slopes

**FIGURE 13:
Soil Survey**

WALGREENS KĪHEI

Walgreen of Maui, Inc.

Island of Maui



Linear Scale (feet)



Source: County of Maui (May, 2013); Natural Resources Conservation Service (2007)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary Interpretations or other spatial analysis.



DATE: 3/27/2015

LEGEND

Site

ALISH Classification

- Prime
- Unique
- Other
- Unclassified

LSB Productivity Rating

- A - Very Good
- B - Good
- C - Fair
- D - Poor
- E - Very Poor

FIGURE 14:
Agricultural Suitability

WALGREENS KĪHEI

Walgreen of Maui, Inc. Island of Maui

North Linear Scale (feet)

0 375 750 1,500

Source: County of Maui (2013); State of Hawaii Department of Agriculture (1977); Land Study Bureau (1972)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary Interpretations or other spatial analysis.

recommended to confirm the presence and level of contamination. Subsequent testing did not detect pesticides and it was concluded that no further evaluation was necessary.

Potential Impacts and Mitigation Measures

The use of the Site for the Walgreens Store is expected to significantly reduce incidences of dumping and the possible impact of any past contaminants. In preparing the Site for construction, Walgreen of Maui, Inc. will comply with all federal, State, and County requirements regarding soil remediation, as necessary.

After construction, over fertilization of landscaping will be avoided to ensure the Store does not contribute to additional nutrients entering the ground or the ocean. Common nitrogen/phosphorus/potash mixed fertilizers are anticipated to be applied as necessary to lawn areas, groundcover, shrubs, and trees. With proper irrigation management practices, leaching and runoff of fertilizers should be negligible.

The use of herbicides will generally be limited to the initial landscaping period. Anticipated application of pesticides will be used as a treatment and not as a preventative measure. As a treatment, application will be limited. In addition, plant selection will be based on hardiness, drought tolerance, pest resistance, as well as aesthetic concerns.

3.5 HYDROLOGY

The Site is located within the Hapapa watershed, which measures 26,493 acres and encompasses three sub-watershed areas of Kulanihako‘i, Waipu‘ilani, and Keokea (Southwest Maui Watershed Plan: Draft Watershed Characterization Report, 2011). Hapapa watershed reaches a maximum elevation of approximately 9,400 feet above mean sea level along Haleakalā’s southwest rift zone where average annual rainfall is approximately 36 inches.

A watershed area captures rainfall and atmospheric moisture from the air and allows the water to drip slowly into underground aquifers or enter stream channels and eventually the ocean. Thus, watershed health has a direct impact on the quality of surface water, groundwater, and near shore marine water. This section provides an analysis of the Hapapa watershed area as it relates to these water resources.

3.5.1 Surface Water

Existing Conditions

Surface water in the Hapapa watershed area collects into a number of major drainage features (gulches) *ma uka* of the Site that are considered intermittent streams. There are no streams classified as perennial in the region and there are no visible stream channels passing through, around or near the Site.

The Site is located within the Keokea sub-watershed area near Keokea Gulch where headwaters naturally flow from the 2,300-foot elevation to Pi'ilani Highway. Water is then routed through six drainage structures crossing under the highway and then spreads out as sheet flow onto the coastal plain (Water Quality Consulting, Inc., 2011).

Stormwater runoff that enters the Site is not collected and flows overland with low volume and little force. Significant rainfall occurs only periodically during winter storms. Most rainfall is absorbed directly into the landscape.

The area *ma kai* of the Site has a low coastal dune with no drainage outlets to the ocean. Ponding occurs behind the coastal dune in some places. These ponds typically are temporary in nature and eventually recede below the surface by percolation and evaporation (Water Quality Consulting, Inc., 2011).

The nearest wetland to the Site is located approximately 600 feet *ma uka* (Figure 15). According to a proposed determination study of the Site conducted by Robert Hobdy Environmental Consultant (2014), no Jurisdictional Wetland or Waters of the United States are present on the Site. This proposed determination will be submitted to the United States Army Corps of Engineers (Corps) for formal determination and certification.

Potential Impacts and Mitigation Measures

The Walgreens Store is not anticipated to have a significant adverse impact on surface water resources. There are no perennial streams or wetlands on or near the Site. While there will be an increase in the amount of impermeable surface area, any runoff generated onsite will be collected in a 20,000 cubic feet retention basin to ensure that the peak rate of runoff leaving the Site will not increase over existing conditions in compliance with the *Rules for the Design of Storm Water Treatment Best Management Practices*, §15-111, Maui County Code (MCC). For more information on the drainage system, see Section 4.6.4 (Drainage) of this EA.

Maui County requires new developments to implement permanent stormwater quality control measures to reduce water pollution from stormwater runoff. The 20,000 cubic feet storage capacity of the onsite drainage retention basin will exceed the storage volume required by the Department of Public Works to meet the stormwater quality regulations associated with development of the Site. See Section 4.6.4 (Drainage System) and Appendix F (Preliminary Engineering Report) for more information regarding drainage and drainage improvements.

During construction, best management practices for managing stormwater and erosion control will be employed so as to avoid temporary inputs of sediment and pollutants into surface water resources. The land that is disturbed by construction will be re-vegetated with a combination of Native Hawaiian and other non-invasive plants shortly after the completion of the construction period.



DATE: 3/27/2015

LEGEND

Site

Wetland Type

Estuarine and Marine Deepwater

Freshwater Emergent Wetland

**FIGURE 15:
Wetlands**

WALGREENS KĪHEI

Walgreen of Maui, Inc. Island of Maui

North

Linear Scale (feet)

0 75 150 300

Source: County of Maui (May, 2013); US Fish & Wildlife Services, National Wetlands Inventory (October, 2013).
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary Interpretations or other spatial analysis.

Long-term water quality is generally impacted by the volume and frequency of discharged pollutants. Pollutants that may contaminate water resources are classified as point (discrete) and nonpoint source pollutants which may include domestic wastewater seepage and stormwater runoff.

In the long-term, to minimize/eliminate Walgreens' contribution to the region's cumulative nonpoint source pollution, Low Impact Development (LID) will ensure storm water quality/quantity is not increased or degraded. The LID will serve to both minimize the volume of water running off the Site as well as allowing sediment and other pollutants to settle out before infiltration into the ground. Overflow from the LID features will be conveyed by an outfall to the retention basin on the *ma kai* side of the Site.

3.5.2 Groundwater

Existing Conditions

The Site is located within the Kama'ole Aquifer System. Groundwater exists as a basal water table where salt and brackish water underlies a floating freshwater lens that is thicker in the center of the island and thins as it reaches the coastal areas and seeps into the ocean. The water table is within 30 inches of the surface at the Site and deep enough to prevent significant wetland indicators from appearing at the surface (Foote et al, 1972). The groundwater level in coastal areas is subject to tidal influences. The direction of groundwater flow in the basal lens is *ma uka* to *ma kai*, east to west.

Although the Site overlies the Kama'ole Aquifer, potable water for the Kīhei-Wailea region is supplied by the 'Īao Aquifer and Waihe'e Aquifer systems, which also supplies the Wailuku-Kahului Region. The Iao and Waihe'e Aquifer Systems are adjacent to each other and extend from the summit of the West Maui Mountains down to Wailuku and stretches north to Kahakuloa. As of July 21, 2003, the 'Īao Aquifer was designated as a groundwater management area by the State Commission on Water Resource Management (CWRM).

Sustainable yield is the amount of groundwater that can be pumped without depleting the source. The sustainable yield of the 'Īao Aquifer System is 20 million gallons per day (MGD) and existing water use is 18.940 MGD, a difference of 1.060 MGD. The sustainable yield of the Waihe'e Aquifer is 8 MGD and existing water use is 4.282 MGD, a difference of 3.718 MGD (Wilson Okamoto Corporation, 2008).

Potential Impacts and Mitigation Measures

The Walgreens Store is not anticipated to have a significant adverse impact on groundwater quality. No long-term uses that could contaminate groundwater are expected to be developed as part of the Walgreens Store.

The Walgreens Store is projected to use approximately 3,000 gallons of water per day. The County of Maui Department of Water Supply (DWS) determines whether sufficient water is available for use without adversely impacting the integrity of the aquifer. For more information on the water system, see Section 4.6.2 (Water System) of this EA.

3.5.3 Marine Waters

Existing Conditions

The Site lies behind a coastal sand dune between 700 and 1,000 feet from the shoreline. There are no stream connections or outlets for water to reach the ocean from the Site.

Near shore marine waters downstream of the Site, as are nearly all the waters along the west-facing shoreline of Maui, are classified as Class “A” waters by the State Department of Health (DOH) (State of Hawai‘i Department of Health, 2013).

According to DOH water quality standards, “it is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters” (HAR §11-54-03(c)(2)).

The marine waters downstream of the Site are currently listed as Section 303(d) impaired water, meaning State ocean water quality standards for specific criteria were not attained or were exceeded (State of Hawai‘i Department of Health, 2014). Along the entire Kīhei Coast, turbidity standards are exceeded most frequently which is the most common pollutant to trigger a marine 303(d) listing statewide. Excessive nutrient levels are also present in marine waters along the Kīhei Coast.

Potential Impacts and Mitigation Measures

The Walgreens Store is not expected to have a significant impact on marine water quality. There are no outlets for water to reach the ocean from the Site. While there will be an increase in the amount of impermeable surface area, any runoff generated onsite will be collected in a 20,000 cubic foot retention basin. The retention basin will ensure that the peak rate of runoff leaving the Site will not increase over existing conditions and will capture floatables and suspended solids in the basins, thus reducing sediment loads discharging to marine waters.

During construction, best management practices for managing stormwater and erosion control will be employed so as to avoid temporary inputs of sediment and pollutants to marine waters. The land that is disturbed by construction will be re-vegetated with a combination of Native Hawaiian and other non-invasive plants shortly after the completion of the construction period.

The discharge of pollutants from point sources is generally regulated through the National Pollutant Discharge Elimination System (NPDES). An NPDES permit will be obtained

specifying measures to prevent stormwater discharges from affecting coastal water quality. Even if an NPDES permit is not required, best management practices shall be incorporated during construction to prevent storm water discharges from affecting coastal water quality. Permanent best management practices like erosion controlling vegetation shall be incorporated into the design to limit post construction levels of erosion.

3.6 NATURAL HAZARDS

Hawai‘i is susceptible to potential natural hazards, such as flooding, tsunami inundation, hurricanes, and wildfires. This section provides an analysis of the Site’s vulnerability to such hazards.

The State of Hawai‘i Department of Defense, Office of Civil Defense operates a system of civil defense sirens throughout the State to alert the public of emergencies and natural hazards, particularly tsunamis and hurricanes.

Impacts from natural hazards can be further mitigated by adherence to appropriate civil defense measures as determined by the State and County of Maui civil defense agencies.

3.6.1 Flood

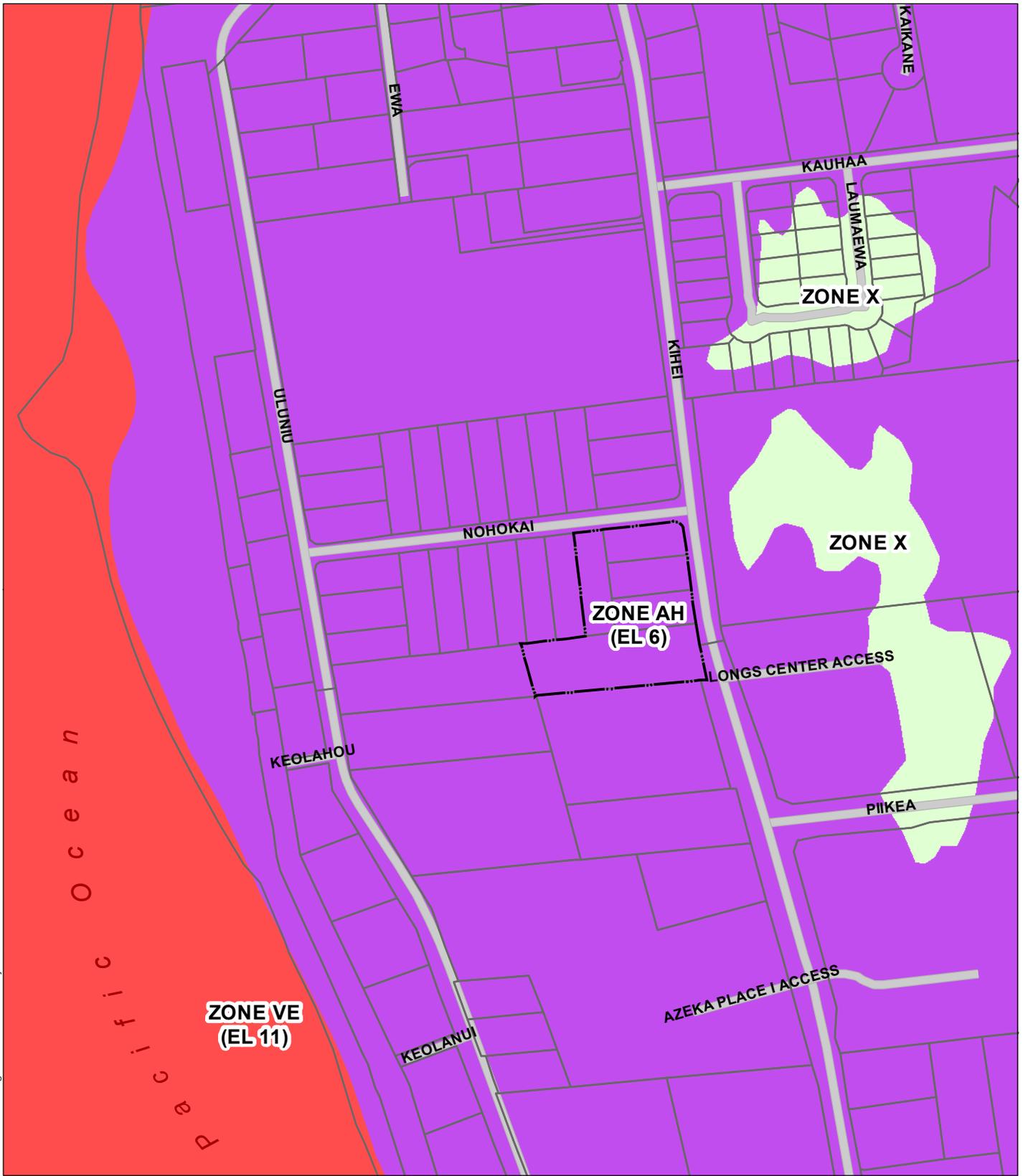
Existing Conditions

The Federal Emergency Management Agency (FEMA) publishes flood information in the form of Flood Insurance Rate Maps (FIRM) used by government and insurance agencies to determine the relative potential for damage during flood events. According to the FIRM, the entire Site is located in Zone AH (flood fringe area) which corresponds to areas of 100-year shallow flooding (usually areas of ponding) where average depths are between one and three feet (Figure 16). Whole-foot base flood elevations derived from detailed analyses are shown at selected intervals within this zone. The base flood elevation within the Site is 6 six feet above mean sea level.

Potential Hazards and Mitigation Measures

The Walgreens Store is not anticipated to increase the Site’s exposure to flooding. The Site is located in an area prone to shallow ponding (Zone AH on the FIRM). During 100-year storm events, ponding may occur onsite. The retention basin will operate as designed and capture stormwater runoff, allowing it to infiltrate into the ground rather than leave the Site.

According to Maui County Code, Chapter 19.62, commercial stores are permitted in Zone AH. However, the building must be designed with finished floor elevations above the designated base flood elevation plus an additional height of at least one foot or receive a variance. A Special Flood Hazard Area Development Permit will be obtained for Site development, which requires that certain flood-mitigation features be incorporated into the design of Walgreens Kīhei. Three principal flood-mitigation features will be incorporated:



DATE: 3/27/2015

LEGEND



Site



Roads

Flood Zones

- AH: 100-year Flood, Flood Depths 1-3 Ft with BFE
- VE: 100-year Flood, Coastal Flood Zone with BFE
- X: Outside 500-year Flood

**FIGURE 16:
 Flood Insurance Rate Map**

WALGREENS KĪHEI

Walgreen of Maui, Inc. Island of Maui

North

0 75 150 300

PRR HAWAII
 A N A S S E C I A D E S I N C

Source: County of Maui (May, 2013); Federal Emergency Management Agency (2012)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

- 1) The building floor will be constructed at elevation 7 feet, placing it 1 vertical foot above the mapped 100-year Base Flood Elevation of 6 feet.¹
- 2) The parking lot will be constructed close to elevation of the existing ground, and approximately 20,000 cubic feet of earth will be excavated from the southwest corner of the Site to create a large retention basin. This excavation will offset the 100-year floodwater volume displaced by the building below the 6 foot Base Flood Elevation and allow Walgreens Kīhei to comply with the “no rise” restriction currently enforced by the Maui County Planning Department for the AH (EL 6) Special Flood Hazard Area by achieving a condition in which there is no net floodwater volume displacement.²
- 3) The Site will be graded so as to guide the 100-year floodwaters around the building and drain toward the ocean to enable the floodwaters to more quickly recede.

See Section 4.6.4 (Drainage System) and Appendix F (Preliminary Engineering Report) for more information regarding drainage and drainage improvements.

3.6.2 Tsunami

Existing Conditions

Since the early 1800’s, approximately 50 tsunami have inundated the State of Hawai‘i’s shores. Seven historical events have caused major damage. According to the FEMA Flood Insurance Rate Maps (FIRM), the Site is located within an area which would be impacted by coastal flooding (from a tsunami). The most recent tsunami to impact Maui, occurred on March 11, 2011 following an 8.9-magnitude earthquake in Japan. Damage was done to low-laying properties.

The Site is located approximately 850 feet from the shoreline in Kīhei. The tsunami evacuation zone extends from the shoreline *ma uka* of South Kīhei Road to Liloa Drive, which includes the Site.

Potential Hazards and Mitigation Measures

The Walgreens Store will not exacerbate any tsunami hazard conditions. The Site is located in the designated tsunami evacuation zone and may be adversely impacted by a tsunami if one should occur. In the event of a tsunami, Walgreens patrons and employees will be evacuated to safe areas outside the tsunami evacuation zone.

¹ Ref. Maui County Code, Section 19.62.060.A.3.a.

² FEMA has not yet delineated the floodway for this particular Special Flood Hazard Area, so Planning Department is currently enforcing a general "no-rise" policy on the floodplain which prevents construction permits from being issued unless it can be proven that a proposed development will not increase the water surface elevation of the base flood at any point. [Ref. Maui County Code §19.62.050.B.3 and §19.62.060.A.6.]

3.6.3 Hurricane

Existing Conditions

Records show that strong wind storms have struck all major islands in the Hawaiian Island chain since the beginning of history. The first officially recognized hurricane in Hawaiian waters was Hurricane Hiki in August of 1950. Since 1982 three devastating hurricanes have impacted Hawai‘i: Hurricane ‘Iwa in 1982, Hurricane ‘Iniki in 1992, and Hurricane Iselle in 2014. While it is difficult to predict these natural occurrences, it is reasonable to assume that future events could likely occur given the recent record.

Potential Impacts and Mitigation Measures

In the event of a hurricane, the potential impact of destructive winds and torrential rainfall will be mitigated through compliance with the 2006 International Building Code for any new construction.

3.6.4 Wildfires

Existing Conditions

The greatest danger of fire is where wildland (trees and brush) borders urban areas. The Hawaiian Islands are vulnerable to wildland fires (especially during the summer months, prolonged drought and/or high winds), and the great majority of wildfires are human-caused (intentionally caused or by negligence) and start along roadsides. Wildfires can and do also occur naturally.

According to Maui Fire Department data, Kīhei-Mākena’s susceptibility of wildfire is high. Between 2005 and 2010 there were 201 wildfires in the Kīhei-Mākena area. The majority of those fires were of undetermined cause, 32 were caused by operating equipment, four were from a type of arch or flame, five were caused by fireworks, and five were from smoking materials. Approximately 2,180 acres were burned during this five-year period.

Potential Impacts and Mitigation Measures

While the hazard of wildland fires exists, the Site is in a predominantly urban area and the Walgreens Store will minimize this risk by planting appropriate landscape that is properly irrigated.

3.7 FLORA

Robert W. Hobdy conducted a botanical and fauna survey of the Site (2014). Field data was collected in June 2014. The results of the survey are summarized below. Appendix B contains the complete report.

Existing Conditions

The Site was cleared many years ago by previous owners and covered with gravel to make the surface useable. About 90 percent of the Site is covered with this gravel surface. A few trees and shrubs grow around the borders.

The Site is mostly covered in gravel but a few large ironwood trees (*Casuarina equisetifolia*) grow on the southern portion and the western border consists primarily of kiawe trees (*Prosopis pallida*) and Indian fleabane shrubs (*Pluchea indica*).

A total of 23 plant species were identified during the course of the survey. Of these, four species are common native plants ‘aki’aki (*Sporobolus virginicus*), ‘ākulikuli (*Sesuvium portulacastrum*), kipukai (*Heliotropium curassavicum*) and milo (*Thespesia populnea*). One species, niu or coconut (*Cocos nucifera*), is a Polynesian introduction. The remaining eighteen species are non-native ornamentals or weeds.

Potential Impacts and Mitigation Measures

The Walgreens Store will not impact any Federal or State of Hawai‘i listed Threatened, Endangered, or Candidate plant species, as none were detected during the survey. This Site has been previously converted to human uses in this urban environment and little remains of a natural environment. The native species are common throughout the tropical Pacific and are of no particular conservation concern. No important native plant habitats occur here either.

3.8 FAUNA

Robert W. Hobdy conducted a botanical and fauna survey of the Site (2014). Field data was collected in June 2014. The results of the survey are summarized below. Appendix B contains the complete report.

Existing Conditions

A total of five bird species were observed at the Site. Most common were the zebra dove (*Geopelia striata*), common myna (*Acridotheres tristis*) and chicken (*Gallus gallus*). Less common were house sparrow (*Passer domeseticus*) and red-crested cardinal (*Paroaria coronata*). Other non-native birds likely to utilize this area include house finch (*Carpodacus mexicanus*), Japanese white-eye (*Zosterops japonicus*), northern cardinal (*Cardinalis cardinalis*) and nutmeg mannikin (*Lonchura punctulata*).

The Site has no habitat for Hawaii’s Endangered waterbirds or the Endangered nēnē goose, and none were seen. The Site is not suitable for Hawaii’s native forest birds that are restricted to higher elevation native forests that are beyond the range of mosquitoes and the deadly avian diseases they carry and transmit.

Only two mammalian species were recorded at the Site during the course of the survey including, a few domestic cats (*Felis catus*) and one roof rat (*Rattus rattus*). Other non-native mammals typically found in the area include the mongoose (*Herpestes auropunctatus*), the house mouse (*Mus domesticus*) and domestic dogs (*Canis familiaris*).

A non-native mourning gecko (*Lepidodactylus lugubris*) was heard from kiawe trees during the evening survey.

Insect life was somewhat sparse due to the general lack of vegetation. Eight species were recorded at the Site during the course of the survey. Most abundant was the dung fly (*Musca sorbens*). One native dragonfly was recorded, the indigenous globe skimmer (*Pantala flavescens*). This dragonfly is common in Hawai‘i as well as throughout the tropics worldwide.

Potential Impacts and Mitigation Measures

The Walgreens Store is not expected to significantly affect any Federal or State of Hawai‘i listed Threatened, Endangered, or Candidate wildlife species, as none were detected during the survey. In addition, the Walgreens Store will not impact the habitat of any wildlife species due to the highly disturbed Site.

The only native species found was the common indigenous globe skimmer dragonfly which is of no conservation focus or concern.

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4 DESCRIPTION OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing conditions of the human environment, preliminary potential impacts of Walgreens Kīhei, and the preliminary mitigation measures to minimize any impacts.

4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Existing Conditions

Xamanek Researches, LLC conducted an archaeological assessment survey for the Site in 2005 for a previous project. No historic properties were identified during the survey. In their letter dated May 23, 2005, the State Historic Preservation Division (SHPD) provided its review of the archaeological assessment survey report and deemed the report to be acceptable. Historical information provided in the report is summarized below. Appendix C contains the complete archaeological assessment survey report as well as the SHPD acceptance letter and an archeological monitoring plan.

Historic Background

The Site resides in the moku of Kula and the ahupua‘a of Waiohuli. The Kula District was a relatively minor political territory under the jurisdiction of West Maui chiefs. The ahupua‘a of Keokea became part of the Hawaiian Government Lands during the Mahele of 1848. Kula land is described by Handy and Handy (1972) as:

“...open country, or plain, as distinct from valley or stream bottom, and has long been used as a term to distinguish between dry, or “kula land” and “wet-taro land”. This is an essential characteristic of Kula, the central plain of Maui which is practically devoid of streams. ...Kula was widely famous for its sweet-potato plantations. ‘Uala was the staple of life here.”

By the 1840s, the increased number of whaling ships anchoring off Maui shores created a substantial market for produce such as sweet and Irish potatoes, which grew well in the Kula region. They were transported from the Kula fields to the shore, where they were often sold directly to ships that called at Kalepolepo. Captain John Halstead established a trading post in 1849 in the village of Kalepolepo to take advantage of this commercial activity. It was known locally as the Koa House and was visited by Kamehamehas III, IV and V. It stood as a prominent landmark for nearly one hundred years (Xamanek Researches, LLC, 2005).

The coastal portion of Kama‘ole ahupua‘a appears to have been relatively unaffected by the upland “potato boom,” which lasted only a few years. For the most part, the coastal area was fairly sparsely occupied by people who primarily concentrated on the exploitation of marine resources (Xamanek Researches, LLC, 2005). Kalepolepo Fishpond is located less than half a

mile northwest of the Site in Ka‘ono‘ulu ahupua‘a. South of Kalepolepo is Waiohuli Kai Pond and to the south of that is Keokea Kai Pond. Another unnamed fishpond is located in Keokea ahupua‘a, closer to the border with Kama‘ole. The presence of these fishponds would have significantly increased the economic potential for the coastal Kula area. Climate is not favorable for agriculture, but quantities of the fish species ‘ama‘ama (mullet) and awa (milkfish) could have been raised. While the original date of construction is not known, traditional mo‘olelo suggest continued use beginning in the middle of the 1500s and continuing through the late 19th century.

Another economic activity in the Kula District consisted of cattle ranching, which had become a booming enterprise by the 1880s. Large sections of land in the Lower Kula area became pastureland, and large sections of Crown land were leased for grazing acreage. Two large ranches operated in this part of Maui—Ka‘ono‘ulu Ranch, and Haleakala Ranch. The latter was founded in 1888. Another smaller ranch is located in the general vicinity of the Site—Kama‘ole Ranch (Xamanek Researches, LLC, 2005).

Archeological Findings

The Site lies within the “coastal zone”—an area of habitation and marine resource exploitation (i.e. fishponds) in past history. The predicted findings, based on background research, would be evidenced by habitation sites and/or possibly associated human burials.

According to the survey, there were no surface remains at the Site. A total of 11 backhoe trenches were used to sample subsurface conditions. There was no evidence of an intact cultural layer found during subsurface investigation on any portion of the Site. It appears that essentially the entire Site has been covered by imported fill. The fill zone in sampled areas ranged from 45 to 70 cm in thickness. All excavated trenches revealed intact marine sand deposits that were located near the groundwater table, which was as shallow as 65 cm below the existing surface of the Site.

Potential Impacts and Mitigation Measures

No historic properties were identified during subsurface testing. In its letter accepting the archeological assessment survey SHPD stated: “The survey has adequately covered the project area documenting no historic properties.” However, archaeological monitoring during all construction activities is recommended given the sensitive nature of the area, the proximity of the Site to both named and unnamed fishponds along the coast, and wetland deposits. Xamanek Researches prepared an archaeological monitoring plan for future construction activities at the Site (see Appendix C).

Per the monitoring plan, Walgreens and its contractors will have an archaeologist present onsite on a full-time basis during construction. The archaeologist will have the authority to halt excavation in the event that cultural materials are identified. Coordination meetings with the

construction crew will be held prior to project initiation. The plan further indicates that an acceptable report will be submitted to SHPD within 180 days of project completion.

In addition, Walgreens and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. The construction documents will include a provision that if undocumented historic sites such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, concentrations of shell or charcoal or artifacts are inadvertently encountered during construction activities, work will cease immediately in the vicinity of the find and the find will be protected. The contractor will immediately contact the State Historic Preservation Division, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary.

4.2 CULTURAL RESOURCES

Hana Pono, LLC prepared a cultural impact assessment for the Site to identify traditional customary practices within the Site and in the vicinity of the area (2014). The cultural impact assessment was conducted in accordance with the OEQC Guidelines for Assessing Cultural Impact and includes archival research and interviews with people knowledgeable of Kula and the surrounding area. Findings of the cultural impact assessment and other relevant information are summarized below. Appendix D contains the complete cultural impact assessment.

Wahi Pana (Legendary Places)

The Kula moku was one of twelve traditional land districts on Maui. The moku of Kula is so called for its kula lands, meaning broad open expanses, likened to pasture land by the ranchers of the last century. Handy relates that the Kula moku was a dry and arid region:

“Kula was always an arid region, throughout its long, low seashore, vast stony kula [open country] lands and broad uplands. Both on the coast, where fishing was good, and on the lower westward slopes of Haleakalā a considerable population existed” (ESC Handy, 114).

There are many historical accounts of legendary places in Kula. One account describes the battle between Kamehameha Nui and the Maui king Kalanikupule. It was near Kalepolepo on the Kula shoreline that Kamehameha is said to have landed his canoes for his invasion of Maui. Kamehameha had previously been beaten by the forces of Maui because of their furious use of the ma‘a (sling) for which Maui’s warriors were famous. But Kamehameha this time had the foreign technology of mortars, muskets, and cannons. It was at Kula where he uttered the now famous saying, “Imua e nā poki‘i. He inu i ka wai ‘awa‘awa”, forward my brothers or drink of the bitter waters. He set fire to his canoes, their only form of retreat, and challenged his men to win the battle or drink the bitter water of defeat and certain death. From Kalepolepo the army of Kamehameha pushed the warriors of Maui back to the West Maui Mountains and defeated Kalanikupule.

Ahupua‘a

According to an 1885 Hawaiian Government Survey, the Site is located within the Waiohuli ahupua‘a. Waiohuli was named for the clouds that come down the slopes of Haleakalā and let loose their rain before retreating again to the *ma uka* regions. Depending on the source or time in history, the Site is said to have been located in either the Waiohuli or Keokea ahupua‘a because these two ahupua‘a were so closely associated.

At the Mahele, Waiohuli and eight other ahupua‘a on other islands were never recorded by King Kamehameha III. Forty years later in 1890, King David Kalākaua and The Kingdom of Hawai‘i Legislature formally assigned these nine previously unaccounted ahupua‘a to the Crown by “An Act to declare certain lands to be part of the Crown Lands and Royal Domain.” (Laws of His Majesty Kalakaua, 158). Historical researchers presume no claims were made for these lands because they were sparsely populated.

There was no population center in Waiohuli until homestead lots were created in the beach area and *ma uka* lands above 2,000 feet elevation in the early 1900s. However, all nine “overlooked” ahupua‘a referred to in this act had one thing in common: water resources such as springs, streams and fisheries, traditionally held by Ali‘inui or Kings. Kalākaua’s act simply formalized a generational kuleana of high chiefs for these prized lands.

Land Commission Awards

Later, in the early 1900s Waiohuli grants and homesteads were issued to individuals Ten Kui Chong and David M. Thompson for portions of the Site (Registered HI Survey Map 2516.) Land Grant 10115 to Ten Kui Chong accounts for TMK 3-9-008:016 portion of the Site, and Land Grant 10043 to David M. Thompson underlies TMKs 3-9-007: 38, 39 and 40, referenced in Maui County zoning ordinances 2313 (Bill 22).

The Land Commission Awards information reveals that no kuleana was awarded in the coastal area of Keokea ahupua‘a. A total of 52 claims are recorded, all of them being in the Kula District. Of those 52 claims recorded, more than half (28) were not awarded. Those claims that were awarded were for houselots, and/or garden plots or kula lands. Eleven of the claimants lived in Waikapu, where they had primary claims, their claims in Kama‘ole being subsidiary claims on small farm plots. The pattern of distribution of LCAs in Keokea is similar to that found in Waiohuli ahupua‘a to the north and Kama‘ole ahupua‘a to the south.

Gathering Practices

The inhabitants of the coastal areas of Waiohuli sustained themselves through the bounty of the ocean. Nearby to them was the fishpond of Kalepolepo, commonly called Ko‘ie‘ie. Kalepolepo was built by an early Maui chief and by the 16th century King Umi of Hawai‘i Island tasked the

commoners with rebuilding the walls. Later, during the reign of Kamehameha I he rebuilt Kalepolepo again, tasking all the people of the west side of Maui to work.

Trails

Ke Alaloa o Maui, the broad highway of Maui constructed by King Pi'ilani crosses through the ahupua'a of Waiohuli on its way to Mākena and not much is mentioned of this area besides Kalepolepo pond and the dryness of the area.

Potential Impacts and Mitigation Measures

The cultural impact statement concludes that the Walgreens Store will have no significant effects on cultural resources, beliefs, or practices. There are no cultural resources at the Site. Traditional gathering practices may have taken place in the greater area of Kula. However, the Site has not been used for traditional cultural purposes within recent times (Hana Pono 2014). The closest cultural resource of significance is the Ko'ie'ie fishpond and the other fishponds along the coast which are being restored for educational opportunities.

4.3 VISUAL RESOURCES

Existing Conditions

Visual corridors are open areas that provide unobstructed views from distant vantage points. The Site is located at the corner of South Kīhei Road and Nohokai Street, and is adjacent to a mixture of commercial and residential land uses. The streetscape is reflective of a major urban street with utility poles and clustered commercial development, intermixed with residential land uses adjoining the street. *Ma uka* views of Haleakalā are available traveling south and north along t South Kīhei Road, as are intermittent *ma kai* views of the Pacific Ocean. There are no unique scenic resources or views located on or across the Site, nor are there within the vicinity of the Site that are identified on any State or County plans ((Christ Hart & Partners, 2001).

Potential Impacts and Mitigation Measures

The Walgreens Store is not anticipated to significantly impact *ma uka* or *ma kai* view corridors since the Site is located on the low, near ocean plain where view corridors do not exist.

From an urban design perspective, the Walgreens Store will further centralize commercial development within the central Kīhei area where commercial development already exists. A McDonald's restaurant and the Azeka I Shopping Center are situated to the south. The Kīhei Center, where a Longs store is located, and Azeka II Shopping Center, the larger of the two Azeka shopping centers, are located to the east. The infill of additional commercial development, adjacent to those existing, is desirable, in that it will provide for greater centralization and massing of commercial uses. It will additionally unify commercial architectural styles, thereby creating a definable commercial node that creates a sense of place.

The building height will be approximately 22 feet with some architectural features at about 24 feet and the main entrance copula feature at 35 feet. These heights are well below the maximum height of 50 feet allowed in the B-2 Community Business district (zone).

Visual impacts will be mitigated by attractive architectural design, adhering to or exceeding setback standards, and by providing fences and appropriate landscape planting in conformance with Section 19.36A.070, MCC to visually screen and soften the parking lot and building.

The store design is compatible with retail and commercial buildings found nearby, along South Kīhei Road and elsewhere on Maui that reflect a unique island style. Distinctive architectural elements include:

- A hipped-roof copula feature at the store entrance;
- Vertical and horizontal articulation providing a pleasing and softening character
- Extensive windows extending from store entrance to create visual interest;
- Pitched awnings over the windows and elsewhere to provide shade and invoke a plantation style;
- Varied exterior surfaces, materials, and textures.
- A unique, fresh, color palate appropriate to the area and
- A building height consistent with, or lower than, many other Kīhei commercial buildings.

Figure 9 contains architectural building elevation drawings showing the style and character of the store. Figure 10 contains 3D drawings from various perspectives.

Landscaping will complement the building design, screen specific areas, and provide visual relief. Key landscape features include:

- Palm trees, shade trees, and appropriate hedges and ground cover plants in the parking lot along South Kīhei Road and Nohokai Street, and at the rear of the property;
- A wide meandering sidewalk along South Kīhei Road and Nohokai Street;
- “Green Streets” features such as storm water planters with permeable drainage rock and plants to slow, filter, and cleanse stormwater; and
- Dense trees and plants and fences or walls along the rear of the property to screen the store and parking lot from neighboring residential properties.

Figure 11 contains the conceptual landscape plan. All landscaping will be in compliance with Section 19.36A.070, MCC and the Maui County Planning Plan.

4.4 NOISE

Existing Conditions

Noise level is an important indicator of environmental quality. In an urban environment, noise is due primarily to vehicular traffic, air traffic, heavy machinery, and heating, ventilation, and air-conditioning equipment. Ramifications of various sound levels and types may impact health

conditions and an area's aesthetic appeal. Noise levels in the vicinity of the Site are generally low with vehicular traffic along South Kīhei Road being the predominant source of background noise. McDonald's restaurant and the Azeka I Shopping Center to the south and the Kīhei Center Azeka I and II Shopping Centers to the east are additional sources of noise at this area.

Potential Impacts and Mitigation Measures

In the short-term, the Walgreens Store could generate some adverse impacts during construction. Noise from heavy construction equipment, such as bulldozers, front-end loaders, material-carrying trucks and trailers would be the dominant source of noise during the construction period. Noise from construction activities will be short-term and will comply with DOH noise regulations (Chapter 11-46, Community Noise Control, HAR). When construction noise exceeds, or is expected to exceed the DOH's allowable limits, a permit must be obtained from the DOH. Specific permit restrictions for construction activities are:

- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday.
- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 9:00 a.m. and after 6:00 p.m. on Saturday.
- No permit shall allow any construction activities that would emit noise in excess of the maximum permissible sound levels on Sundays and holidays.
- The use of pile drivers, hoe rams, jack hammers 25 lbs. or larger, high-pressure sprayers, and chain saws may be restricted to 9:00 a.m. to 5:30 p.m., Monday through Friday.

In the long-term, the Walgreens Store is not expected to significantly increase noise in the area relative to existing conditions: 1) due to the relatively small increase in traffic-generated noise expected; and 2) because the retail uses typically do not generate significant noise levels. The pharmacy drive through window may be of concern regarding increased noise to the immediate residential neighbor, however operating hours of the pharmacy drive through window are expected to be 8 AM to 10 PM Monday through Friday and 9 AM to 6 PM on Saturdays and Sundays. In addition, the volume of traffic using pharmacy drive through windows is typically much less than that of a fast food restaurant drive through window, such as at the neighboring McDonald's restaurant.

4.5 AIR QUALITY

Existing Conditions

Air quality refers to the presence or absence of pollutants in the atmosphere. It is the combined result of the natural background and emissions from many pollution sources. The impact of land development activities on air quality in a proposed development's locale differs by project phase (site preparation, construction, occupancy) and project type. In general air quality in the Kīhei region is considered good. There are no point sources of airborne emissions in the immediate

vicinity of the Site. Non-point sources (e.g. automobiles) of emissions are not significant enough to generate a high concentration of pollutants. The relatively high air quality can also be attributed to the region's constant exposure to wind, which quickly disperses concentrations of emissions.

Potential Impacts and Mitigation Measures

The Walgreens Store is not anticipated to significantly impact local air quality. Air impacts attributed to the Walgreens Store could include dust generated by short-term, construction related activities. Site work such as grading and building construction, for example, could generate airborne particulate. All construction activities will comply with the provisions of Chapter 11-60.1-33, HAR on fugitive dust. Standard dust control measures such as regular watering, sprinkling, and the installation of dust screens will be implemented to minimize the potential impact from wind-blown emissions. The small amount of traffic generated by the store may result in a slight increase in the volume of traffic in the region, which would increase vehicular emissions such as carbon monoxide. However, this increase is not considered significant when compared to the overall number of vehicles in Kīhei and in consideration of existing ambient conditions.

4.6 INFRASTRUCTURE

4.6.1 Roadways and Traffic

Phillip Rowell and Associates prepared a Traffic Impact Analysis Report (TIAR) to evaluate the potential traffic impacts resulting from the creation of the Walgreens Store (2014). The TIAR includes an analysis of existing conditions and projected future conditions both without and with the Store. Key conclusions of the TIAR are summarized below. Appendix E contains the complete TIAR.

Existing Conditions

Access to the Site is from South Kīhei Road and Nohokai Street.

- **South Kīhei Road** – South Kīhei Road is an undivided north-south County collector roadway that provides local access to shopping centers and visitor accommodations along the Kīhei coastline. In the vicinity of the Site, South Kīhei Road is a two-lane roadway with a posted speed limit of 30 miles per hour.
- **Nohokai Street** – This two-lane, undivided, east-west roadway connects South Kīhei Road with Uluniu Road.

The Maui Bus operates the Kīhei Islander (Route 10) and the Kīhei Villager (Route 15) along South Kīhei Road, Lipoa Street and Liloa Street. There are bus stops along South Kīhei Road and Lipoa Street. The nearest bus stops are along Pi'ikea Avenue east of South Kīhei Road.

Existing traffic volumes and turning movements were evaluated at six intersections along South Kīhei Road: 1) Lipoa Street; 2) Pi‘ikea Avenue; 3) McDonald’s/Longs Driveway; 4) Nohokai Street; 5) Kauhaa Street; and 6) Waipuilani Road. Traffic counts were obtained during peak hour traffic in May 2014 while public schools were in session.

For the year 2014, the TIAR concluded that the existing left turn lane at the McDonald’s Driveway is performing at a less than satisfactory level-of-service during the afternoon peak hour; however, the overall intersection operates at an acceptable level-of-service. All other intersections and lanes are performing at satisfactory levels.

Potential Impacts and Mitigation Measures

Access to and egress from the Walgreens Store will be from South Kīhei Road, Nohokai Street, and an driveway interconnection from the adjacent McDonald’s parking lot. The primary access will be provided from South Kihei Road, approximately midway between the McDonald’s driveway and Nohokai Street. All traffic movements are expected to be will be allowed into and out of this driveway. The second access will be along the south side of Nohokai Street at the west end of the Site. All traffic movements will be allowed into this driveway; however only right turns will be allowed out. The interconnection between Walgreens and McDonald’s is expected to reduce some vehicle movements to/from South Kihei Road and Nohokai Street for customers patronizing either business.

Roadway improvements will include vehicle capacity and bicycle and pedestrian facility upgrades along South Kihei Road and Nohokai Street in front of the Site (see Figures 12a and 12b) in compliance with both the Maui County Department of Public Works’ roadway standards for commercial uses and Maui County’s “Complete Streets” bike and pedestrian facilities policy. More specifically, these improvements will include:

- Widening South Kihei Road in front of the Site by 12 feet to:
 - Increase the public right-of-way (the widened area will be dedicated to the County);
 - Provide a median along South Kihei Road to accommodate a two-way left turn lane up to Nohokai Street; this median will allow for left turns into the Walgreens driveway and onto Nohokai Street;
 - Provide bike lanes on both sides of South Kihei Road; and
 - Provide curbs, sidewalks, and landscaped area in front of Site.
- Widening Nohokai Street in front of the Site by 12 feet to:
 - Increase the public right-of-way (the widened area will be dedicated to the County);
 - Provide separate left and right turn lanes for turns onto South Kihei Road; and
 - Provide curbs, sidewalks, and landscaped area in front of the Site.
- New crosswalks at the South Kīhei Road/Nohokai Street corner extending across South Kīhei Road and Nohokai Street.

The TIAR analyzed future traffic conditions for the forecast year 2020 both without and with Walgreens Kīhei. The “with Walgreens Kīhei” scenario assumes that the roadway improvements noted above will be in place. Background traffic without Walgreens Kīhei is based on the overall projected future growth for the region and other future development projects likely to be built by the forecast year, such as Downtown Kīhei and Tamura Plaza. Walgreens-related traffic is expected to generate approximately 43 new trips during the morning peak hour and 61 trips during the afternoon peak hour.

For the year 2020, the TIAR concluded that all six study intersections will operate at acceptable levels both without and with Walgreens Kīhei. The left turn lanes at the McDonald’s Driveway will continue to perform at a less than satisfactory level-of-service as a result of background traffic and not Walgreens Kīhei. Typically, the construction of traffic signals would be assessed. However, the McDonald’s Driveway is 300 feet from the South Kīhei Road and Pi‘ikea Avenue intersection, a signalized intersection. This distance is less than the minimum required distance between signalized intersections. While traffic signals would mitigate the long delays for left turns, they would result in greater congestion on South Kīhei Road. Therefore, traffic signals are not recommended at this intersection. It should be noted that this intersection was signalized in the past. The traffic signal was removed prior to 2000.

4.6.2 Water System

Existing Conditions

Potable water in Kīhei is supplied by the Department of Water Supply (DWS) Central Maui Water System, which draws from a series of surface water sources and groundwater wells in upper Wai‘ehu and North Waihe‘e which draw their water from the ‘Īao and Waihe‘e Aquifers.

DWS maintains an existing 12-inch water line that runs along the *ma kai* side of South Kīhei Road and an existing 6-inch water line on Nohokai Street. The Site is within approximately 900 feet from a reclaimed water line along East Waipuilani Road. There is a 1½-inch meter and a 5/8 inch meter serving TMK 3-9-008:016. A 2 ½-inch standpipe at the northeast corner of the site now provides fire protection to the Site.

Potential Impacts and Mitigation Measures

Potable water will be supplied by the DWS Central Maui Water System. The existing 1 ½-inch water meter at the southwest corner of the Site will serve as the point of connection. In their letter dated August 6, 2014, DWS stated that system improvements and meter adequacy will be determined in the subdivision/consolidation process and building permit process. Unless all lots are consolidated, water service to any lot requires a separate water meter.

Walgreens Kīhei is expected to have an average daily potable water consumption of approximately 3,000 gallons per day (gpd), with about 2,000 gpd used for domestic consumption and about 1,000 gpd used for landscape irrigation.

The Walgreens Store will need a fire protection system capable of delivering a fire flow of 2,250 gallons-per-minute from a storage reservoir with at least a 270,000 gallon storage capacity to meet Maui County Fire Department and Department of Water Supply standards for fire suppression. The existing County 2.0 MG Makai Heights water tank will provide the needed storage volume for firefighting, and a 250-foot long extension of the existing 12-inch water main under South Kihei Road will provide the mainline capacity needed to deliver the required fire flow to the fire sprinkler system. The existing 2½-inch standpipe will be replaced with a new 6-inch fire hydrant that will be relocated onto the improved South Kihei Road shoulder.

To minimize the increase in potable and non-potable water demand the following conservation measures will be considered for Walgreens Kīhei:

- Use of EPA WaterSense labeled plumbing fixtures;
- Installation of flow reducers and faucet aerators in all plumbing fixtures where-ever possible;
- Installation of dual flush toilets with high efficiency models that use 1.28 gallons per flush or less;
- Installation of bathroom sink faucets with fixtures that do not exceed 1 gpm at 60 psi. Laundry facilities and/or individual unit machines will use Energy Star labeled washers;
- Limiting the distance from the hot water source to the tap early in the design stage;
- Installing infrastructure necessary to utilize a future connection to reclaimed water line;
- Use of Smart Approved WaterMark irrigation products including ET irrigation controllers, drip irrigation, and water saving spray heads; and
- Avoidance of plant fertilizers and pruning that would stimulate excessive growth. Timing watering to occur in the early morning or evening to limit evaporation. Limiting turf to as small an area as possible.

4.6.3 Wastewater System

Existing Conditions

The Kīhei District Wastewater Collection System serves the area within the Kīhei-Mākena Community Plan. Each of the five parcels within the Site contains a 6-inch County sewer service lateral. The laterals are connected to existing gravity sewer mains under South Kīhei Road and Nohokai Street which convey collected wastewater to the Kīhei Pump Station No. 4 for transport to the County of Maui Kīhei Wastewater Reclamation Facility for processing and disposal.

The Maui County Department of Environmental Management Wastewater Reclamation Division reports that the County's Kīhei Wastewater Reclamation Facility has a treatment capacity of 8.0 mgd with remaining capacity of approximately 4.6 mgd based on measured average daily flows.

Potential Impacts and Mitigation Measures

Walgreens Kīhei is expected to discharge approximately 620 gallons of wastewater per day into the County sewerage system. There is sufficient treatment capacity available at the Kīhei Wastewater Reclamation Facility to accommodate wastewater flows from Walgreens Kīhei.

The Walgreens Store will connect to the Kīhei District Wastewater Collection System via a new property line sewer service manhole that connects to one of the five existing sewer service laterals within the Site.

Kihei Walgreens will be subject to two impact fees levied by the County of Maui to cover the cost of wastewater collection and treatment infrastructure serving the Kīhei area, including:

- 1) A "Regional Wastewater Treatment System Facility Expansion Assessment Fee," for treatment plant expansion, which is assessed at \$4.65 per gallon of project flow; and
- 2) A "Kihei Regional Wastewater Treatment System - Collection/Transmission System Project Assessment Fee," for collection system upgrades, which is assessed at \$6.64 per gallon of project flow.

4.6.4 Drainage System

Existing Conditions

The Site is situated on generally flat coastal land where the average slope is a half percent. Currently, surface runoff *ma uka* of the Site flows naturally to Pi'ilani Highway. Water is then routed through six drainage structures crossing under the highway and then spreads out as sheet flow onto the coastal plain (Water Quality Consulting, Inc., 2011). The absence of storm drainage collection and disposal infrastructure along South Kīhei Road or Nohokai Street results in a significant, but undetermined, amount of runoff from these roads and the lands discharging onto them draining through the Site on its way to the ocean.

Stormwater runoff that enters the Site is not collected and flows overland with low volume and little force. In its present undeveloped condition, the 2-acre Site generates approximately 3.2 cubic feet per second (cfs) of surface runoff during a 50-year 1-hour storm (Warren S. Umemori Engineering, Inc., 2015). This runoff drains to the southwest across the site, then through the adjoining residential lands on its way to the ocean.

Potential Impacts and Mitigation Measures

Walgreens Kīhei will generate approximately 6,500 cubic feet of runoff at a peak flow rate of approximately 6.6 cfs during a 50-year 1-hour storm event once the building and parking lot have been constructed. This represents a 3.4 cfs increase in peak flow rate over what is discharged from the existing gravel parking lot. The additional pavement from the widening of South Kīhei Road and Nohokai Street is expected to produce a 0.2 cfs increase in 50-year 1-hour peak stormflow and generate an additional 360 cubic feet of stormwater.

A 20,000 cubic foot retention basin will be constructed in the southwest corner of the Site to capture stormwater runoff. The Site will be graded so that runoff from the building and parking lot will drain to the retention basin. Pre-existing offsite runoff will continue to drain through the site. The 20,000 cubic foot capacity of the retention basin will hold the entire 6,500 cubic feet of runoff generated by Walgreens Kīhei, and will also exceed the minimum 3,900 cubic feet of storage capacity required by the Maui County Department of Public Works to keep the 50-year 1-hour post-development peak discharge rate at or below pre-development levels. The 20,000 cubic foot capacity of the onsite drainage retention basin also will exceed the 5,300 cubic foot storage volume required by the Dept. of Public Works to meet the stormwater quality regulations to reduce water pollution from stormwater runoff.

Because there is no underground County storm drainage system present along South Kīhei Road and Nohokai Street, a “Green Streets” approach will be employed to collect the runoff from these widened streets. Runoff from the roadway widening will be directed through curb openings into stormwater planters constructed along the road shoulders where the stormwater will be held and allowed to percolate into the ground. The stormwater planters will be constructed with crushed cinder or permeable growing medium so as to provide a storage capacity no less than the 360 cubic feet of storage attributable to the added pavement. Figures 12a and 12b contain roadway section drawings showing the stormwater planters.

4.6.5 Solid Waste Disposal

Existing Conditions

The County of Maui Department of Environmental Management (DEM), Solid Waste Division operates and maintains, either by County personnel or by contracted services, all solid waste collection and disposal facilities on the island. Solid waste generated in the Kīhei-Mākena region is transported to the Central Maui Landfill located in Pu‘unēnē, four miles southeast of the Kahului Airport on Pūlehu Road. The Central Maui Landfill receives approximately 500 tons of solid waste per day. Since 2000, approximately 30 percent of the solid waste generated annually in Maui County is diverted by means of recycling, reuse, and composting (R.M Towill Corporation 2007). The County is targeting a 50 percent waste diversion rate by 2030 (R.M Towill Corporation 2007).

Potential Impacts and Mitigation Measures

Waste generated by site preparation will primarily consist of vegetation, rocks, and debris from clearing, grubbing, and grading. Soil and rocks displaced from grading and clearing will be used as fill within the site as needed and if of suitable quality. Construction waste will consist of waste lumber, concrete, and other building materials. Demolition and construction waste that cannot be recycled will be taken to the Maui Demolition and Construction Landfill (privately operated) near Mā‘alaea.

After construction, the Walgreens Store will generate solid waste related to retail and commercial uses. To minimize waste, recycling bins will be provided for store patrons.

Waste that cannot be recycled will be disposed of in the County’s Central Maui Landfill in Pu‘unēnē. In the Public Facilities Assessment Update County of Maui (2007), R.M. Towill Corporation projected that the Central Maui Landfill will have adequate capacity to accommodate residential and commercial waste through the year 2025.

4.6.6 Electrical and Communication Systems

Existing Conditions

Maui Electric Company’s Maalaea Power Plant serves the Kihei-Wailea region from the Kihei and Wailea Substations, which are connected by a 69kV (kilo-volt) overhead transmission line that runs along the western shoulder of Piilani Highway. The existing MECO facilities at the Kihei Walgreens Site currently run overhead, with a 3-phase distribution line on the mauka side of South Kihei Road (across the street from the Site) and a single-phase overhead line down Nohokai Street on south side of the street.

Hawaiian Telcom provides telephone and DSL services to the Kihei area. Hawaiian Telcom’s existing telephone plant serving the area should have sufficient capacity to service Kihei Walgreens. Existing telephone facilities in this area are overhead and follow the Maui Electric Company overhead lines.

Oceanic Time Warner Cable is the cable television provider on Maui, but also provides telephone and Internet connection services. Existing Oceanic facilities are overhead and follow those of Maui Electric Company and Hawaiian Telcom.

Potential Impacts and Mitigation Measures

The Walgreens Store will require 3-phase power. Service will need to be extended underground from the existing line across the street and a ground mounted transformer installed on the Site. Walgreens will be required to construct the entry, street crossing, as well as underground ducts and structures.

Per Maui County requirements, existing overhead utilities along the property will need to be relocated underground, unless a variance is obtained.

4.7 SOCIO-ECONOMIC CHARACTERISTICS

4.7.1 Population

Existing Conditions

Prior to the 1970s, Kīhei was a small coastal village with fewer than 3,000 residents and very limited resort-oriented and commercial uses. By 1980, the population had more than doubled to about 7,000 people as more substantial commercial space and resort units were developed. The population boom continued on through the next two decades and began to stabilize by 2010. Population growth trends in Kīhei including both resident and visitor populations are provided in the table below

Year	Number of Residents	Number of Visitors	Total Population	% change
1990	15,365	16,079	33,434	-
2000	22,870	16,247	41,117	23%
2010	28,114	26,399	56,523	37%
2020 (projection)	33,227	29,864	63,091	12%

The Maui County Planning Department (2006) projections indicate that the resident population in the Kīhei-Mākena region will increase to 33,227 people by 2020.

In addition to the resident population, for the year 2020 the Maui County Planning Department projects that average visitor population in the Kīhei-Mākena region will be approximately 29,864 people.

Combining the resident population and the average visitor count, the total population of the Kīhei-Mākena region is estimated to be 63,091 people in 2020.

Potential Impacts and Mitigation Measures

The Walgreens Store will not increase area population and will not create additional strain on other area facilities. The Walgreens Store will benefit the Kīhei-Mākena population by providing a retail/pharmaceutical store near residents.

4.7.2 Economy

Existing Conditions

The Maui economy is heavily dependent on the visitor industry. This is especially evident in the Kīhei-Mākena region, which is a major resort destination area with many available vacation rentals, world-class resorts, and recreational facilities.

In 2008, the advent of economic recession on the U.S. mainland and throughout the Pacific Basin significantly impacted the tourism industry, leading to increased unemployment, business failures, slackening of residential and contractor demand, tightening of available credit, and modified spending levels island wide. A previously fast-growing population was somewhat stabilized by out-migration and a stagnation of gross household income.

Despite the economic downturn, Kīhei-Mākena has demonstrated the ability to rebound faster than most neighbor island sectors, a function of its large working-class resident population and a highly competitive tourism industry. Visitor numbers are slowly increasing and the unemployment rate is at its lowest since 2008.

Potential Impacts and Mitigation Measures

The Walgreens Store will result in expenditures that will have a positive impact on the County of Maui and State of Hawaii economies, on both a direct and indirect basis. By increasing the level of capital investment and capital flow in the region, which will in turn create employment opportunities, the Walgreens Store will serve as an economic stimulus in the short-term. The cost of construction is estimated to be \$3,000,000 and will be funded by Walgreen of Maui, Inc.

In the long-run, the Walgreens Store will provide regional employment opportunities for residents and in turn will result in resident expenditures, regional monetary and employment effects, and taxes and fees accruing to the County of Maui and State of Hawaii.

4.8 PUBLIC SERVICES AND FACILITIES

4.8.1 Schools

Existing Conditions

Public Schools in Kīhei include Kīhei Elementary (grades K-5), Kamali‘i Elementary (grades K-5), Lokelani Intermediate (grades 6-8), and Kīhei Public Charter School (K-12). Maui High School (grades 9-12), the designated public high school for Kīhei residents, is located in Kahului. In the 2013-2014 school year, total student enrollment for Kīhei Elementary and Kamali‘i Elementary was 947 and 585, respectively. Lokelani Intermediate had 550 students, Kīhei Public Charter School had 576 students, and Maui High had 1,908 students.

A new high school is proposed to be built in Kīhei on approximately 77 acres *ma uka* of Pi'ilani Highway between Kūlanihāko'i and Waipu'ilani Gulches. Design enrollment for Kīhei High School will be for up to 1,941 students in grades 9-12. Phase I of the Kīhei High School is slated to open in 2016 with 800 students (Group 70 2011)

There are a number of private schools in the vicinity of the Site including Montessori Hale O Keiki (grades Preschool-8) and Horizons Academy of Maui (K-12).

University of Hawai'i Maui College is located in Kahului and offers Bachelor and Master degree programs.

Potential Impacts and Mitigation Measures

The Walgreens Store will not generate new residents or introduce new school-aged children to the area. Therefore, no additional demands will be placed on DOE facilities.

4.8.2 Police, Fire and Medical Services

Existing Conditions

Police Protection

The Maui Police Department is headquartered at the Wailuku Police Station on Mahalani Street. Twenty-four hour full-time uniformed police service for South Maui (Mā'alaea, Kīhei, Wailea, Mākena) is provided by the Kīhei Patrol District, which is currently located in a leased storefront within the Kīhei Town Center on South Kīhei Road, approximately 1.5 miles from the Site. Two small offices are located at Wailea Point between Kama'ole Beach Parks II and III and at the old Kīhei Community Center.

According to the Maui Police Department, currently the Kīhei Police District is commanded by one Police Captain, who is assisted by one Police Lieutenant, and one Civilian Clerk. Staffing for the Kīhei District Station includes seven Police Sergeants who supervise 30 Police Officer positions, three Community Police Officer positions, two Visitor Oriented Police Officer positions, and one School Resource Officer position. There are also six Public Safety Aides (civilian employees).

Projected for the near future is a new Kīhei District Police Station at the intersection of Pi'ilani Highway and Kanani Road, 2 miles from the Site. This full service police station will replace the current police station at Kīhei Town Center.

Fire Protection

The fire station nearest the Site is the newly built Wailea Fire Station located at the intersection of Kilohana Drive and Kapili Street between Pi'ilani Highway and South Kīhei Road. The Wailea Station is approximately one half mile from the Property (less than five minutes away)

and services the area from Kama‘ole Beach Park II to Mākena. In addition, there are three other fire stations within 20 minutes from the Property.

The two-story Wailea Station is equipped with a 1,500 gallon per minute apparatus, a 95-foot mid-mount ladder truck and a 3,500 gallon water tanker truck. In addition, an emergency helipad and fuel dispensing station is located *ma uka* of the fire station.

The Wailea Fire Station is staffed with 33 full-time paid firefighters where there are fire personnel on duty each day, 24-hours per day.

Medical Services

The major hospital serving Maui is Maui Memorial Hospital located in Wailuku. This 231-bed facility provides acute, general, and emergency care services. There are medical clinics and offices throughout Kīhei and Wailea; however, these offer limited medical services. Medical clinics and offices include: Kīhei Clinic and Wailea Medical Service, Kīhei Pediatric Clinic, Kīhei Physicians, the Kīhei-Wailea Medical Center, Maui Medical Group, and Kaiser Permanente.

Potential Impacts and Mitigation Measures

There may be an occasional and unavoidable demand for police, fire, and medical services associated with the Walgreens Store, however, it is anticipated that the existing services will not be adversely affected by the Walgreens Store.

4.8.3 Recreational Facilities

Existing Conditions

The total County-owned sub-regional park space in the Kīhei-Mākena region is approximately 114.2 acres, with the bulk of the community’s parks categorized as special use beach parks.” Special use parks serve a regional or islandwide populace because their activities or points of interest are tied to a specific location.

Waipuilani Park, located on off of South Kihei Road, is the County park facility nearest to the Site.

In addition to County parks, Mākena State Park is located in the Kīhei-Mākena region. This 164-acre scenic wildland beach park is characterized by prominent cinder cone Pu‘u ‘Ōla‘i and a large white sand beach. Because it is a State park, the 164 acres of Mākena State Park is not included in the inventory of County beach parks provided in the *Public Facilities Assessment Update County of Maui* (R.M. Towill Corporation 2007), nor is the area of Mākena State Park considered in relation to the projected need for an additional 37 acres of County beach park space by 2030.

Potential Impacts and Mitigation Measures

The Walgreens Store is not expected to negatively impact recreational facilities in the Kīhei-Mākena region.

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5 CONTEXTUAL ISSUES

This section summarizes the cumulative, secondary, and unavoidable impacts of Walgreens’ Kīhei in context with other development in the area.

5.1 CUMULATIVE IMPACTS

Cumulative impacts are the result of incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions within the area, regardless of who initiates the action.

Walgreens Kīhei is not part of a larger action nor would it occur within the context of larger or foreseeable future actions. Proposed projects within the vicinity of the Site are listed in the table below. Cumulative impacts resulting from these projects include increased population and greater demands on public infrastructure systems and services. Walgreens Kīhei will not contribute to population growth in Kīhei or significantly impact public infrastructure systems and services. The population of the Kīhei-Mākena region is projected to grow regardless of Walgreens Kīhei and the needs of a growing population relating to traffic, infrastructure, public services, and other issues will need to be addressed regardless if some or all projects are built.

Project	Type	Status
Downtown Kīhei Project	Business/Commercial	Planned/Committed
Tamura Plaza	Business/Commercial	Planned/Committed
Pi‘ilani Promenade	Business/Commercial	Planned/Committed
Kīhei High School	Education	Planned/Committed
Maui Research and Technology Park	Commercial/Mixed-Use	Planned/Committed
South Maui Community Park	Park	Planned/Committed
Waipuilani Estates	Residential	Planned/Committed

The Maui Island Plan provides direction for future growth, the economy, and social and environmental decision on Maui Island through 2030. The backbone of the Maui Island Plan is the Directed Growth Strategy, which delineates urban and rural growth boundaries for select areas of Maui. The purpose of the urban and rural growth boundaries is to ensure that future development occurs in an orderly fashion, taking into account population projections and future demands on housing, infrastructure, services, and public facilities.

Walgreens Kīhei is an infill development located within the Urban Growth Boundary for the Kīhei-Mākena region. The Urban Growth Boundary allows in-fill and revitalization opportunities and encourages “new urbanism” and “neo-traditional design” techniques.

5.2 SECONDARY IMPACTS

Secondary impacts, or indirect impacts, are those which have the potential to occur later in time or farther in distance, but are still reasonably foreseeable. They can be viewed as actions of others that are taken because of the presence of the project. They may include growth inducing effects, and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. For example, secondary impacts from highway projects can occur because they can induce development by removing one of the impediments to growth, transportation access.

Walgreens Kīhei is not expected to present significant adverse secondary impacts. The Walgreens Store may attract more commercial, mixed-use, or residential development on the vacant lots adjacent to and near the Site as a result of the spill-over effect. The vacant lots and associated infill development are included within the Urban Growth Boundary of the Maui Island Plan.

5.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Potential environmental impacts resulting from the development of Walgreens Kīhei have been discussed throughout this EA, and mitigation measures have been provided for adverse impacts. The potential unavoidable adverse impacts, while minimal can be mitigated as follows:

- Short-term construction impacts to air quality, noise, solid waste generation, storm water quality/quantity are anticipated. Walgreen of Maui, Inc. will address these impacts through compliance with County, State, and Federal rules, regulations, permits, regarding fugitive dust, community noise control, and non-point source discharges.
- Long-term potential impacts to storm water quality/quantity are not anticipated with implementation of recommended design and civil engineering mitigation measures. To address storm water quality/quantity issues, mitigation measures will include a retention basin and other drainage improvements to capture additional runoff as a result of the additional non-pervious surface. In addition, best management practices that include structural and non-structural controls designed to inhibit runoff and erosion will be implemented.
- The Site is located in an area prone to shallow ponding (Zone AH on the FIRM). During 100-year storm events, ponding may occur onsite. The retention basin will operate as designed and capture stormwater runoff, allowing it to infiltrate into the ground rather than leave the Site. The requirements of Maui County Code, Chapter 19.62, will be followed to ensure that there is no rise in base flood elevation and no adverse impact to the flood plain due to the Site improvements.

The development of Walgreens Kīhei will involve the commitment of certain land and fiscal resources. Major resource commitments include the land and capital, construction materials,

non-renewable resources, labor, and energy required for the community's completion. The impacts represented by the commitment of resources should be weighed against the significant positive and recurring benefits that will be derived from the Walgreens Store versus the consequences of either taking no action or pursuing another less beneficial use of the Site.

Walgreens Kīhei expands the range of beneficial uses of the Site as envisioned in the Kīhei-Mākena Community Plan. While the entire Site is located within the B-Commercial District on the Kīhei-Mākena Community Plan Land Use Map, a portion of the Site is located within Maui County's R-3 Residential zone. The Walgreens Store will require a change in zoning for the portion of the Site that is zoned R-3 Residential to B-2 Community Business. The Site is already within an urban area and is considered to be infill development that is complementary to the surrounding community.

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6 LAND USE CONFORMANCE, POLICIES, AND CONTROLS

The processing of various permits and approvals are prerequisites to the creation of the project. Relevant State of Hawai‘i and City & County of Honolulu land use plans, policies, and ordinances are described below.

6.1 STATE OF HAWAI‘I

6.1.1 State Environmental Review Law (Chapter 343, Hawai‘i Revised Statutes)

The State Environmental Review Law (Chapter 343, Hawai‘i Revised Statutes (HRS)) (State of Hawai‘i, 2001) requires an environmental assessment for any action that proposes the use of State or County lands. This Environmental Assessment has been prepared in compliance with Chapter 343, HRS as described in Section 1.5.

6.1.2 State Land Use Law (Chapter 205, Hawai‘i Revised Statutes)

The State Land Use Law (Chapter 205, HRS) establishes the State Land Use Commission and authorizes this body to designate all lands in the State into one of four districts: Urban, Rural, Agricultural, or Conservation. Walgreens Kīhei is located within the State Urban District (Figure 5). The proposed uses are consistent with the Urban designation of the Site.

6.1.3 Hawai‘i Coastal Zone Management Program (Chapter 205A, Hawai‘i Revised Statutes)

The National Coastal Zone Management (CZM) Program was created through passage of the Coastal Zone Management Act of 1972. Hawai‘i’s CZM Program, adopted as Chapter 205A, HRS, provides a basis for protecting, restoring, and responsibly developing coastal communities and resources. The objectives and policies of the CZM Program encompass broad concerns such as impact on recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the management of development. Each of the Counties have adopted SMAs in which a development’s consistency with the objectives and policies of the CZM program are evaluated through the SMA permitting process. The Site is located with Maui County’s designated SMA (See Figure 7). SMA permits are administered by the Maui County Planning Department and decided upon by the Maui County Planning Commission. Walgreens Kīhei is consistent with the objectives and policies of the CZM program as discussed below.

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 recreational value including, but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;*
 - (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 uses 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;*
 - (vi) Adopting water quality standards and regulating point and nonpoint 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;*

Discussion: Walgreens Kīhei is not anticipated to generate additional demands on existing public parks and beach areas. To protect water resources for purposes including recreation, the State of Hawai‘i has adopted water quality standards. Generally, these standards will require the submittal and adherence to a National Pollution Discharge Elimination System (NPDES) permit. This permit requires compliance with best management practices (BMPs) during construction to minimize soil erosion into adjacent waterways. The NPDES permit will also include

requirements to maintain water quality during operation. An NPDES permit will be required for the development of Walgreens Kīhei.

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;*

Discussion: Walgreens Kīhei will not adversely affect historic resources. No archaeological or historic resources were found during the course of the archaeological assessment survey. However, given the sensitive nature of the area, the proximity of the Site to both named and unnamed fishponds along the coast, and wetland deposits, archaeological monitoring will be conducting during all construction activities.

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 that are not coastal dependent to locate in inland areas;*

Discussion: Walgreens Kīhei will not impinge upon any significant public scenic view corridors and will have no significant impact on views toward the ocean or Haleakalā. Any visual impacts to neighboring residences will be mitigated by utilizing setback standards and by providing walls and landscape planting within the setback area to visually screen and soften the parking lot and

adjacent structures. To mitigate “strip” type visual impacts along South Kīhei Road, the Walgreens Store will be designed with sensitivity to the pedestrian.

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.*

Discussion: Appropriate best management practices (BMPs) and erosion control measures will be implemented to ensure that coastal ecosystems are not adversely impacted by construction activities. A retention basin will be constructed onsite to collect stormwater runoff generated by Site improvements. The drainage system will be designed in accordance with applicable regulatory standards to mitigate potential adverse impact to surrounding properties.

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 industry 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.*

Discussion: Walgreens Kīhei is not a coastal dependent development. However, Walgreens Kīhei will provide economic contributions in an area that is suitable for growth. The Site is located among business, commercial, and residential areas and is in alignment with the objective and policies for economic use.

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 non-point source pollution hazards;*
- (B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and non-point source pollution hazards;*
- (C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and*
- (D) Prevent coastal flooding from inland projects.*

Discussion: The Walgreens Store is not anticipated to increase the Site's exposure to flooding. The Site is located in an area prone to shallow ponding (Zone AH on the FIRM). During 100-year storm events, ponding may occur onsite. The retention basin will operate as designed and capture stormwater runoff, allowing it to infiltrate into the ground rather than leave the Site. As applicable, a flood hazard area development permit will be obtained for Site development which will be in accordance with the standards for development set forth by Section 19.62.060, Maui County Code.

The Site is located in the designated tsunami evacuation zone and may be adversely impacted by a tsunami if one should occur. In the event of a tsunami, Walgreens patrons and employees will be evacuated to safe areas outside the tsunami evacuation zone.

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 or 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.*

Discussion: Meetings were held with members of the Kīhei Community Association, Maui Planning Commission, and Maui County Council to facilitate timely processing of applications for development permits and review permit requirements.

Potential short and long-term impacts of the Walgreens Store will be reviewed by the public and agencies through this environmental review process.

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.*

Discussion: This EA serves as a disclosure document of potential impacts and mitigation measures, including coastal management issues. The EA is published in the Office of Environmental Quality Control's Environmental Notice, whereby opportunity for comment by agencies and the public are provided.

Pre-consultation comments for this EA were obtained and are reproduced in Appendix A.

Beach Protection

Objective: *Protect beaches for public use and recreation.*

- (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.*

Discussion: The Site is located away from the shoreline, such that adverse impacts on beach processes are not expected. Appropriate best management practices (BMPs) and erosion control measures will be implemented to ensure that coastal ecosystems are not adversely impacted by construction activities. A retention basin will be constructed onsite to collect stormwater runoff generated by Site improvements. The drainage system will be designed in accordance with applicable regulatory standards to mitigate potential adverse impact to surrounding properties.

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.*

Discussion: Walgreens Kīhei will not have a significant adverse impact on marine or coastal resources. Appropriate best management practices (BMPs) and erosion control measures will be implemented to ensure that marine and coastal resources are not adversely impacted by construction activities. A retention basin will be constructed onsite to collect stormwater runoff generated by Site improvements. The drainage system will be designed in accordance with applicable regulatory standards to mitigate potential adverse impact to surrounding properties.

6.1.4 Special Management Area Guidelines, Chapter 205A-26, Hawai‘i Revised Statutes

In addition to the objectives and policies of the Hawai‘i CZM Program in Section 6.1.3, Chapter 205A-26, HRS, provides guidelines for approving any development within the special management area.

The guidelines listed in Chapter 205A-26, HRS, along with a detailed discussion of how Walgreens Kīhei conforms to these guidelines is discussed below.

- (1) All development in the special management area shall be subject to reasonable terms and conditions set by the authority in order to ensure:*
- (A) Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided to the extent consistent with sound conservation principles;*
 - (B) Adequate and properly located public recreation areas and wildlife preserves are reserved;*
 - (C) Provisions are made for solid and liquid waste treatment, disposition, and management which will minimize adverse effects upon special management area resources; and*
 - (D) Alterations to existing land forms and vegetation, except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, wind damage, storm surge, landslides, erosion, siltation, or failure in the event of earthquake.*

Discussion: The Site is located away from the shoreline, beaches, recreation areas, and natural reserves; therefore, impacts to these resources as a result of the Walgreens Store is not expected.

Solid and liquid waste will be properly disposed of via...

To protect water resources, the State of Hawai‘i has adopted water quality standards. Generally, these standards will require the submittal and adherence to a National Pollution Discharge Elimination System (NPDES) permit. This permit requires compliance with best management practices (BMPs) during construction to minimize soil erosion into adjacent waterways. The NPDES permit will also include requirements to maintain water quality during operation. An NPDES permit will be required for the development of Walgreens Kīhei.

Walgreens Kīhei is not anticipated to generate additional demands on existing public parks and recreational amenities. Walgreens Kīhei will not impinge upon any significant public scenic view corridors and will have no significant impact on views toward the ocean or Haleakalā. Any visual impacts to neighboring residences will be mitigated by utilizing setback standards and by providing walls and landscape planting within the setback area to visually screen and soften the parking lot and adjacent structures.

The Walgreens Store is not anticipated to increase the Site's exposure to flooding. The Site is located in an area prone to shallow ponding (Zone AH on the FIRM). During 100-year storm events, ponding may occur onsite. The retention basin will operate as designed and capture stormwater runoff, allowing it to infiltrate into the ground rather than leave the Site. As applicable, a flood hazard area development permit will be obtained for Site development which will be in accordance with the standards for development set forth by Section 19.62.060, Maui County Code.

The Site is located in the designated tsunami evacuation zone and may be adversely impacted by a tsunami if one should occur. In the event of a tsunami, Walgreens patrons and employees will be evacuated to safe areas outside the tsunami evacuation zone.

(2) No development shall be approved unless the authority has first found:

- (A) That the development will not have any substantial adverse environmental or ecological effect, except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health, safety, or compelling public interests. Such adverse effects shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect, and the elimination of planning options;*
- (B) That the development is consistent with the objectives, policies, and special management area guidelines of this chapter and any guidelines enacted by the legislature; and*
- (C) That the development is consistent with the county general plan and zoning. Such a finding of consistency does not preclude concurrent processing where a general plan or zoning amendment may also be required.*

Discussion: Taken together with other proposed and planned developments, Walgreens Kīhei will not add to any adverse environmental or ecological effect or eliminate any planning options. See Section 5.1 (Cumulative Impacts) for more information. Walgreens Kīhei is consistent with the objectives and policies of the special management area guidelines (Chapter 205A-26), the Maui Island Plan and Kīhei-Mākena Community Plan.

The Site is zoned R-3 Residential District and B-2 Community Business District. To allow development of the Walgreens Store, the portion of the Site zoned R-3 Residential (TMKs 2-3-9-007:037; 2-3-9-007:038; 2-3-9-007:039; 2-3-9-007:040) is proposed to be rezoned to B-2 Community Business District which is consistent with the Kīhei-Mākena Community Plan. A change in zoning is being sought concurrently with this EA and SMA application.

(3) The authority shall seek to minimize, where reasonable:

- (A) Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon;*

- (B) Any development which would reduce the size of any beach or other area usable for public recreation;*
- (C) Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management areas and the mean high tide line where there is no beach;*
- (D) Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast; and*
- (E) Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.*

Discussion: Walgreens Kīhei is located away from the shoreline and will not alter any marine water body, reduce the size of any beach or restrict public access to any ocean or stream.

Pi‘ilani Highway is the nearest State highway to the Site and coast. The Site and coast is not visible from Pi‘ilani Highway. The height of the Store will not exceed 35 feet at the highest point and will not interfere with or detract from the line of site toward the sea from the highway.

Walgreens Kīhei will not adversely affect water quality. To protect water resources, the State of Hawai‘i has adopted water quality standards. Generally, these standards will require the submittal and adherence to a National Pollution Discharge Elimination System (NPDES) permit. This permit requires compliance with best management practices (BMPs) during construction to minimize soil erosion into adjacent waterways. The NPDES permit will also include requirements to maintain water quality during operation. An NPDES permit will be required for the development of Walgreens Kīhei.

The Walgreens Store will not impact the habitat of any wildlife species due to the highly disturbed Site. In addition, the Site is not suitable for Hawai‘i’s endangered waterbirds or other native bird species.

In addition the Walgreens Store will not adversely affect potential or existing agricultural uses of land, as the Site is within an urban area and the soils are not conducive to agricultural uses.

6.1.5 Hawai‘i State Plan, Chapter 226, Hawai‘i Revised Statutes

The Hawai‘i State Plan (Chapter 226, HRS), establishes a set of goals, objectives and policies that serve as long-range guidelines for the growth and development of the State. Objectives and policies pertinent to the proposed project are as follows:

HRS § 226-18: Objectives and policies for the economy in general.

Objective: Planning for the State’s economy in general shall be directed toward achievement of the following objectives:

- (1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai'i's people.
- (2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.

Policies:

- (10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.
- (11) Maintain acceptable working conditions and standards for Hawaii's workers.
- (12) Provide equal employment opportunities for all segments of Hawaii's population through affirmative action and nondiscrimination measures.
- (13) Encourage businesses that have favorable financial multiplier effects within Hawaii's economy.

Discussion: Walgreens Kīhei will increase employment opportunities within the state by creating positions for approximately 30 employees. The Store will also contribute toward a steadily growing and diversified economic base and the expansion of the health and wellness industry on Maui.

HRS § 226-21: Objectives and policies for socio-cultural advancement – education.

Objective: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.

Policies:

- (1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.
- (2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.
- (8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.

Discussion: The objectives of Walgreens Kīhei include improving community health and wellness and providing convenient access to quality pharmacy, retail, and health-care products and services.

HRS § 226-108: Priority guidelines and principles to promote sustainability.

- (1) Encouraging balanced economic, social, community, and environmental priorities;

- (2) *Encouraging planning that respects and promotes living within the natural resources and limits of the State;*
- (3) *Promoting a diversified and dynamic economy*
- (4) *Encouraging respect for the host culture;*
- (5) *Promoting decisions based on meeting the needs of the present without compromising the needs of future generations;*
- (6) *Considering the principles of the ahupua'a system; and*
- (7) *Emphasizing that everyone, including individuals, families, communities, business, and government, has the responsibility for achieving a sustainable Hawaii.*

Discussion: In harmony with Walgreens' commitment to improve health and wellness, the design and construction of Walgreens Kīhei will exceed the standards established in the Hawaii State Energy Conservation Code (Chapter 181, Title 13, Hawai'i Administrative Rules) and the Maui County Energy Code (Chapter 16.16A, MCC), both of which are based on the International Energy Conservation Code. Conservation measures of the store will include:

- Light-emitting diode (LED) lighting throughout, including the building interior, building exterior and in the parking lot; all outdoor lights will be shielded in compliance with Chapter 20.35, (Outdoor Lighting), MCC.
- A carefully designed lighting layout designed and engineered to provide a safe environment that maximizes the output of each fixture, thereby minimizing redundant fixtures and their associated energy use;
- Wall insulation with a R-Value more than two times greater than the code-required R-Value;
- Roof insulation with a R-Value at least 10 percent greater than the code-required R-Value
- Low-flow plumbing fixtures to reduce water consumption
- "Green Streets" features such as storm water planters with permeable drainage rock and plants to slow, filter, and cleanse stormwater.

6.2 COUNTY OF MAUI

County-specific land use plans and ordinances pertaining to the Walgreens Kīhei include the Countywide Policy Plan, Maui Island Plan, Kihei-Makena Community Plan, and Chapter 19.90A, MCC.

6.2.1 Countywide Policy Plan

The Countywide Policy Plan was adopted in March 2010 and is a comprehensive policy document for the islands of Maui County to the year 2030. The plan replaces the *General Plan of the County of Maui 1990 Update* and provides the policy framework for the Maui Island Plan as well as for updating the nine detailed Community Plans.

The Countywide Policy Plan provides broad goals, objectives, policies and implementing actions that portray the desired direction of the County’s future. The following objectives and policies are applicable to Walgreens Kīhei.

Goal: Strengthen the Local Economy

Objective 1: Promote an economic climate that will encourage diversification of the County’s economic base and a sustainable rate of economic growth.

Policies:

(h) Encourage businesses that promote the health and well-being of the residents, produce value-added products, and support community values

Discussion: Walgreens Kīhei will contribute toward a steadily growing and diversified economic base and the expansion of the health and wellness industry on Maui. The objectives of Walgreens Kīhei include improving community health and wellness and providing convenient access to quality pharmacy, retail, and health-care products and services.

Goal: Improve Physical Infrastructure

Objective 5: Improve the planning and management of infrastructure systems.

Policies:

(g) Ensure that infrastructure is built concurrent with or prior to development.

Discussion: Walgreens Kīhei will include vehicle capacity and bicycle and pedestrian facility upgrades along South Kīhei Road and Nohokai Street in front of the Site (see Figures 12a and 12b) in compliance with both the Maui County Department of Public Works’ roadway standards for commercial uses and Maui County’s “Complete Streets” bike and pedestrian facilities policy. Section 4.6 (Infrastructure) and Appendix F (Preliminary Engineering Report) contain additional information regarding infrastructure improvements related to the Store.

Goal: Promote Sustainable Land Use and Growth Management

Objective 1: Improve land use management and implement a directed-growth strategy.

Policies:

(e) Encourage redevelopment and infill in existing communities on lands intended for urban use to protect productive farm land and open-space resources.

Discussion: Walgreens Kīhei is an infill development within central Kīhei area where commercial development already exists. The infill of additional commercial development,

adjacent to those existing, is desirable, in that it provides for greater centralization and massing of commercial uses that does not impact farm land or open space resources. The Site is within the State Urban District and is designated “B Commercial” on the *Kīhei-Mākena Community Plan* Land Use Map.

6.2.2 Maui Island Plan

The Maui Island Plan provides direction for future growth, the economy, and social and environmental decision on Maui Island through 2030. The backbone of the Maui Island Plan is the Directed Growth Strategy, which specifies growth boundary areas for Maui. Growth boundaries are a long-range planning tool used on Maui to evaluate proposals involving community plan amendments, changes in zoning, development proposals or utility expansions.

The Walgreens Kīhei Site is within the Urban Growth Boundary of the Directed Growth Maps. The purpose of the Urban Growth Boundary is to ensure that future development occurs in an orderly fashion, taking into account population projections and future demands on housing, infrastructure, services, and public facilities. The Urban Growth Boundary allows in-fill and revitalization opportunities and encourages “new urbanism” and “neo-traditional design” techniques. The following plan policies are applicable to Walgreens Kīhei.

Policy 8.1.g *The County shall implement a zoning program to comprehensively redistrict and rezone lands within UGBs according to updated community plan policies and map designations.*

Discussion: The Walgreens Kīhei Site is within the UGB and is designated “B Commercial” on the *Kīhei-Mākena Community Plan* Land Use Map. The Site is comprised of five parcels, four of which front South Kīhei Road in an area with existing commercial uses, and one of which is already zoned B-2 Community Business. A change in zoning to B-2 Community Business from R-3 Residential is being sought for four of the five parcels to bring all of the parcels into conformance with *Kīhei-Mākena Community Plan* Land Use Map “B Commercial” designation and provide for the use of the Site for the Store.

Policy 8.1.i *The County will promote (through incentives, financial participation, expedited project review, infrastructure/public facilities support, etc.) appropriate urban infill, redevelopment and the efficient use of buildable land within UGBs to avoid the need to expand the UGBs.*

Discussion: Walgreens Kīhei is an infill development within central Kīhei area where commercial development already exists. The use of the Site for the Store is an appropriate infill development and represents an efficient use of buildable land within UGB. The infill of additional commercial development adjacent to those existing is desirable, in that it provides for greater centralization and massing of commercial uses and allows for efficient use of existing infrastructure.

6.2.3 Kīhei-Makena Community Plan

The *Kīhei-Mākena Community Plan* is one of nine community plans developed to address the unique aspects of each region. The community plan was adopted by Ordinance No. 2641 on March 6, 1998. According to the *Kīhei-Mākena Community Plan Land Use Map*, the Site is designated B Commercial (Figure 6). The community plan objectives and policies relevant to Walgreens Kīhei are provided below.

Goal: Land Use

Policies:

- (f) Establish a distribution of land uses which provides housing, jobs, shopping, open space, and recreation areas in close proximity to each other in order to enhance Kīhei's neighborhoods and to minimize dependence on automobiles.*
- (h) Develop commercial services at the following locations to meet community needs:*
 - 2) A central business and commercial center for Kīhei clustered about the South Kīhei Road/Road "C" intersection.*
 - 3) In existing commercially zoned areas along South Kīhei Road in the vicinity of Kalama Park.*
- (i) Limit commercial services to neighborhood business uses or other low-key business activities with a residential scale on those properties, which abut single-family residential areas.*

Discussion: Walgreens Kīhei contributes toward distribution of land uses which provides for convenient access to quality pharmacy, retail, and health-care products and services with proximity existing neighborhoods foster pedestrian access. The Store is an infill development within central Kīhei area where commercial development already exists. The infill of additional commercial development, adjacent to those existing, is desirable, in that it provides for greater centralization and massing of commercial uses. With a building height of approximately 22 feet (with some architectural features at about 24 feet and the main entrance copula feature at 35 feet), the heights are well below the maximum height of 50 feet allowed in the B-2 Community Business district (zone) and is consistent with the style and character of other commercial uses along South Kīhei Road.

Goal: Economic Activity

Policies:

- (f) Increase the availability and variety of commercial services to provide for regional needs and strategically establish small scale commercial use within, or in close proximity to, residential areas.*

Discussion: Walgreens Kīhei will contribute toward increasing the availability and variety of commercial services for regional needs by providing convenient access to quality pharmacy, retail, and health-care products and services in close proximity to existing residential neighborhoods.

Goal: Urban Design Standards

Policies:

- (a) Establish a maximum of thirty-five (35) feet in building height for new commercial facilities.*

Discussion: With a building height of approximately 22 feet (with some architectural features at about 24 feet and the main entrance copula feature at 35 feet), the heights are well below the maximum height of 50 feet allowed in the B-2 Community Business district (zone) and is consistent with the style and character of other commercial uses along South Kīhei Road.

6.2.4 Maui County Zoning

The Maui County Code establishes zoning districts, permitted uses, and development standards within the zoning districts. It also regulates development in special districts such as the Flood Hazard District.

The Site is situated within the County of Maui B-2 Community Business District and R-3 Residential District. The proposed use will require a change in zoning from R-3 to B-2 for TMKs (2) 3-9-007:037, 038, 039, 040. This change in zoning process may also include amending unilateral conditions pertaining to TMK (2) 3-9-8: 16 which was previously rezoned to B-2 Community Business.

Change in Zoning

A change in zoning approval must meet the following criteria, as found in MCC Section 19.510.040.4:

- 1. The proposed request meets the intent of the general plan and the objectives and policies of the community plans of the county;*

Discussion: As described in Section 6.2.1 and 6.2.3 of this EA, the proposed use meets the intent of the Countywide Policy Plan (General Plan) and the objectives and policies established in the Kīhei-Mākena Community Plan.

- 2. The proposed request is consistent with the applicable community plan land use map of the county;*

Discussion: All of the parcels which comprise the Walgreens Kīhei Site are designated “B Commercial” on the *Kīhei-Mākena Community Plan* Land Use Map (See Figure 6).

3. *The proposed request meets the intent and purpose of the district being requested;*

Discussion: Section 19.18.010, MCC referring to the purpose and intent of the Community Business District, states that: “A Community business district is intended to provide all types of goods and services for the community, with the exception of those uses more generally associated with industrial district, but at a lower intensity of use than in the central business district.

The primary purpose of the Walgreens Store is to provide Kīhei residents with an increased level of goods and services within close proximity to their community. The proposed rezoning will further centralize commercial activity along South Kīhei Road that has historically supported commercial development. Therefore, the Walgreens Kīhei meets the intent and purpose of the district being proposed.

4. *The application, if granted, would not adversely affect or interfere with public or private schools, parks, playgrounds, water systems, sewage and solid waste disposal, drainage, roadway and transportation systems, or other public requirements, conveniences and improvements;*

Discussion: As described in Section 4.6 and 4.8 of this EA, Walgreens Kīhei will not produce a detrimental impact upon schools, parks, playgrounds, water, sewage, solid waste disposal, drainage, roadway and transportation systems, or other public requirements, conveniences and improvements. As for roadways, Walgreens Kīhei will include vehicle capacity and bicycle and pedestrian facility upgrades along South Kīhei Road and Nohokai Street in front of the Site (see Figures 12a and 12b) in compliance with both the Maui County Department of Public Works’ roadway standards for commercial uses and Maui County’s “Complete Streets” bike and pedestrian facilities policy.

5. *The application, if granted would not adversely impact the social, cultural, economic, environmental, and ecological character and quality of the surrounding area;*

Discussion: As described in Section 3 and 4 in this EA, the proposed action will not adversely impact the social, cultural, economic, environmental, and ecological character and quality of the surrounding area.

6. *If the application change in zoning involves the establishment of an agricultural district with a minimum lot size of two acres, an agricultural feasibility study shall be required and reviewed by the Department of Agriculture and the U.S. Natural Resource Conservation Service.*

Discussion: The Walgreens Kīhei change in zoning application does not involve the establishment of an agricultural district; therefore this criterion is not applicable.

Unilateral Agreement

On February 11, 1987, a change in zoning was approved for TMK (2) 3-9-008:016 through Ordinance No. 1644 “A bill for an ordinance to change zoning from R-3 Residential District to B-2 Community Business District (Conditional Zoning) for property situated at Kihei, Maui, Hawaii.” As such, TMK (2) 3-9-008:016 is subject to the following unilateral conditions:

In 1987 the zoning of TMK 3-9-008:016 was changed from R-3 Residential to B-2 Community Business District (Ordinance 1644-87). At the time fast-food, drive-in restaurant was proposed at on the parcel. The restaurant was never built; however the parcel is still encumbered by the following four conditions imposed by the change in zoning ordinance and the associated unilateral agreement:

- 1. That there shall be constructed a concrete wall on the North/Maalaea and West/Makai side boundaries of the subject property to separate the subject property from the adjoining residential properties. That there shall be constructed a wood fence with a landscaped/buffer area along the subject property’s South/Makena side boundary.*
- 2. That there shall be provided ten (10) parking stalls in addition to the required number of stalls based on the applicable square footage of the buildings to be constructed of the subject property pursuant to the parking ordinance, Chapter 19.36, Maui County Code.*
- 3. That all structures/buildings shall not exceed two (2) stories or thirty-five feet (35’) in height, whichever is less.*
- 4. That a fast-service, drive-in restaurant operation has been proposed for the front, East/Mauka portion of the subject property. Notwithstanding the approval of this use for this portion of the subject property, without prior Council approval, there shall be no restaurant and/or food activities or operations on the rear, West/Makai portion of the subject property, the area of said portion being approximately 0.4 acres, and more specifically described and shaded in red in Exhibit “D” attached to the Unilateral Agreement and Declaration for Conditional Use.*

Discussion: With the change in zoning (from R-3 Residential to B-2 Community Business) sought for the additional four parcels which comprise the Site (TMKs (2) 3-9-007:037, 038, 039, 040) Walgreen of Maui, Inc. seeks to amend the conditions imposed on TMK 3-9-008:016 so that any conditions imposed as part of the current change in zoning would be applicable and appropriate to the proposed use as a Walgreens Store and would apply uniformly to the entire Site.

6.3 MAJOR APPROVALS AND PERMITS

A listing of permits and approvals required for the Project is presented below:

Special Flood Hazard (Maui County, Department of Public Works)

Table 1: Approvals and Permits

Permit/Approval	Responsible Agency
Chapter 343, HRS Compliance	Office of Environmental Quality Control
National Pollutant Discharge Elimination System (NPDES) Permit (if over 1 ac. Land disturbance)	State Department of Health
Special Management Area Permit	Maui County, Planning Department
Change in Zoning	
Special Flood Hazard Area Development Permit	
Subdivision/Consolidation Approval	
Building Permit	Maui County, Department of Public Works
Grading Permit	
Work on County Highway Permit	

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7 ALTERNATIVES

This section identifies and evaluates a range of alternatives that could meet the purpose and need and possibly avoid, reduce, or minimize adverse environmental effects. The reference point to compare alternatives is the “No Action” alternative.

7.1 NO ACTION ALTERNATIVE

The primary purpose of Walgreens Kīhei, as discussed in Section 2.2.2 is to expand the range of products and enhance long-term productivity of the Site.

Under the “No Action” alternative, Walgreens Kīhei would not be built and the Site would remain in its current state: vacant with sparse vegetative coverage consisting of a few trees and large open spaces covered with gravel. It is not known if the current use of the Site for the Open-Air Market and parking would continue indefinitely. There would be no corner drugstore that is easily accessible from a major thoroughfare. A Change in Zoning would not be sought for TMKs (2) 3-9-007:037, 038, 039, 040 and the current R-3 Residential District zoning for these parcels would not be changed at this time. At some point in the future the R-3 zoned parcels could be developed in conformance with the existing R-3 zoning (which allows for several other uses in addition to single family homes), or another attempt may be made to change the zoning.

Since TMK 3-9-008:016 is zoned B-2 Community Business, in the future it is likely that a commercial use, other than the existing Open-Air Market, would be developed on this parcel. The intent of the R-3 Residential District is to provide areas for single-family dwellings without the detraction of commercial and industrial activities. At some point in the future the the R-3 zoned parcels of the Site could be developed in conformance with the existing R-3 zoning. Alternatives possible under the R-3 zoning are discussed in Section 7.2 (Residential Build Out of R-3 Lots).

The “No Action” alternative would result in the Site being largely retained in its existing vacant condition until such time that it is economically viable to develop the existing B-2 Community Business lot and the remaining R-3 Residential lots.

The “No Action” alternative also would not achieve the objectives stated in Section 2.2.3 (Statement of Objectives) and would result in the majority of the Site not being utilized for its highest and best; therefore this alternative has been eliminated.

7.2 RESIDENTIAL BUILD OUT OF R-3 LOTS

Four of the five parcels that comprise the Site are zoned R-3 Residential (TMKs (2) 3-9-007:037, 038, 039, 040). The intent of the R-3 Residential District is to provide areas for single-family dwellings without the detraction of commercial and industrial activities, although other uses are permitted and or may be allowed as special uses.

At some point in the future the R-3 zoned parcels could be developed in conformance with the existing R-3 zoning. However given the location of TMKs (2) 3-9-007: 038, 039, 040 along South Kīhei Road, the presence of retail commercial uses along both sides of South Kīhei Road immediately to the south, and the “B Commercial” designation of the parcels on the *Kīhei-Mākena Community Plan Land Use Map*, it seems unlikely that single family homes would be built on these parcels. Rather, it seems likely that if Walgreens Kīhei is not be built, another commercial use will be proposed on the R-3 zoned parcels at some point, either with or without the inclusion TMK 3-9-008:016, which is zoned B-2 Community Business, in the project area.

Because residential build out of the R-3 zoned lots would not achieve the objectives stated in Section 2.2.3 (Statement of Objectives) and would result in the majority of the Site not being utilized for its highest and best; this alternative has been eliminated.

As discussed, the more appropriate highest and best use of the Site is for commercial rather than residential use because of its surroundings and Community Plan Designation as B-Commercial. Assuming the Site is retained in vacant residential use, an impact in the form of lost goods and services, jobs, wages, and tax revenues will be generated. As such, the Residential Build Out of R-3 Lots was rejected.

7.3 BUSINESS COMPLEX ALTERNATIVE

A previous proposal in 1987 included the development of a “Fast-Service Drive-In Restaurant” on a portion of TMK 3-9-008:016. A Change in Zoning from R-3 Residential District to B-2 Community Business was granted in 1987, but the restaurant was never built.

In 2001, the owner of TMK 3-9-008:016 and the owner of adjacent TMKs 3-9-007:037; 3-9-007:038; 3-9-007:039; 3-9-007:040, proposed the Stinson & R.C. Families’ Kihei Business Complex, which would have included approximately 24,000 square feet of retail, restaurant, and office space with 88 parking stalls. Because the four additional parcels were zoned R-3 Residential, a change in zoning application was submitted along with request to amend two conditions from the 1987 change in zoning for TMK 3-9-008:016. An application for a SMA Use Permit was also submitted and draft environmental assessment (EA) was prepared. For unknown reasons the landowners never completed processing the change in zoning and SMA Use Permit applications, a final EA was never prepared, and the Stinson & R.C. Families’ Kihei Business Complex was never built.

As part of the Business Complex, additional retail and office space was proposed to support existing and emerging neighborhoods and business establishments. The project required roadway improvements on County owned street rights-of-way, to provide upgraded vehicular access from South Kīhei Road and Nohokai Street into the Site.

7.4 ALTERNATE DESIGN

Walgreens Kīhei has been designed to be compatible with existing commercial structures in the area as well as addressing pedestrian needs and the relationship to adjacent single-family residences. Several alternative architectural designs were considered, however none of these were found to provide the adequate mix that the current design allows. An asserted effort has been made to combine economic constraints with desired aesthetics and human needs.

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8 FINDING AND DETERMINATION

To determine whether the Walgreens Store may have a significant impact on the physical and human environment, all phases and expected consequences of the proposed project have been evaluated, including potential primary, secondary, short-range, long-range, and cumulative impacts. Based on this evaluation, the Approving Agency (County of Maui Planning Department) has issued an Anticipated Finding of No Significant Impact (AFONSI). The supporting rationale for this finding is presented in this chapter.

8.1 SIGNIFICANCE CRITERIA

The discussion below evaluates the significance of the Project's impacts based upon the Significance Criteria set forth in Hawai'i Administrative Rules section 11-200-12.

- (1) *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;*

Discussion: Walgreens Kīhei will not result in an irrevocable commitment to loss or destruction of any natural or cultural resources. The Site is vacant with sparse vegetative coverage consisting of a few trees and large open spaces covered with gravel. The Site does not provide unique habitat and no Federal or State of Hawai'i listed threatened, endangered, or candidate plant or animal species will be disturbed.

The Site has been the subject of archaeological and cultural studies conducted in and around the Site. Both studies reveal the absence of any resource potentially subject to irrevocable loss as a result of construction.

- (2) *Curtails the range of beneficial uses of the environment;*

Discussion: Walgreens Kīhei will not curtail the range of beneficial uses of the environment. The Site is within the State Urban District, designated as "B Commercial" on the *Kīhei-Mākena Community Plan* Land Use Map, and zoned for commercial and residential uses. In addition there are no unique or important natural or cultural resources within the Site. Creation of Walgreens Kīhei allows for the highest and best economic use of the Site.

- (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;*

Discussion: The Environmental Policies enumerated in Chapter 344, HRS promote conservation of natural resources, and an enhanced quality of life for all citizens. Walgreens Kīhei is not expected to significantly impact any natural resources as none are present within the Site. The Store is expected to enhance the quality of life for the surrounding community by improving access to quality, affordable retail and health-care products and services.

(4) *Substantially affects the economic or social welfare of the community or State;*

Discussion: Walgreens Kīhei will have a positive impact on the social and economic welfare of the community by providing jobs, wages, and benefits as well as improving community health and wellness by providing convenient access to quality pharmacy, retail, and health-care products and services..

(5) *Substantially affects public health;*

Discussion: Walgreens Kīhei is expected to have a positive impact on public health and improve community health and wellness by providing convenient access to cost-effective pharmacy, retail, and health-care products and services.

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

Discussion: Walgreens Kīhei is not expected to present significant adverse secondary impacts. Walgreens Kīhei will not increase area population and will not create additional strain on other area facilities. in the areawill be impacted Roadway improvements include widening South Kīhei Road and Nohokai Street in front of the Site to mitigate traffic impacts and the TIAR concluded that intersections in the vicinity will operate at acceptable levels with Walgreens Kīhei. The Walgreens Store may attract more commercial, mixed-use, or residential development on the vacant lots adjacent to and near the Site as a result of the spill-over effect. The vacant lots and associated infill development are included within the Urban Growth Boundary of the Maui Island Plan.

(7) *Involves a substantial degradation of environmental quality;*

Discussion: Walgreens Kīhei will not substantially degrade environmental quality. Construction-related impacts such as noise and air quality will be temporary and short-term, and will be minimized and mitigated to avoid environmental degradations.

(8) *Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;*

Discussion: Walgreens Kīhei is not part of a larger project, nor does it commit the State or County to any other larger actions, and it will not generate any additional actions having a cumulative effect on the environment.

(9) *Substantially affects a rare, threatened or endangered species or its habitat;*

Discussion: No Federal or State of Hawai‘i listed Threatened, Endangered, or Candidate species or their habitat will be impacted by Walgreens Kīhei as none were identified during the biological surveys.

(10) *Detrimentially affects air or water quality or ambient noise levels;*

Discussion: No State or Federal air quality standards will be violated during or after the construction of Walgreens Kīhei. The only anticipated issues related to air quality would be during construction; however, construction activities would be temporary. Long-term negative impacts related to air quality are not expected.

No State or Federal water quality standards will be violated during or after the construction of the Walgreens Kīhei; the Store will be required to comply with nonpoint source prevention measures through the NPDES permit, when applicable.

Construction activities will inevitably create temporary noise impacts. If necessary contractors will employ mitigation measures to minimize noise including the use of mufflers and implementing construction curfew periods. Pursuant to Chapter 11-46, Hawai‘i Administrative Rules, all construction activities must comply with all community noise controls. In the long-term, the Walgreens Store is not expected to significantly increase noise in the area relative to existing conditions: 1) due to the relatively small increase in traffic-generated noise expected; and 2) because the retail uses typically do not generate significant noise levels

(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;*

Discussion: The Walgreens Store is not anticipated to increase the Site’s exposure to flooding. The Site is located in an area prone to shallow ponding (Zone AH on the FIRM). During 100-year storm events, ponding may occur onsite. The retention basin will operate as designed and capture stormwater runoff, allowing it to infiltrate into the ground rather than leave the Site. As applicable, a Special Flood Hazard Area Development Permit will be obtained for Site development which will be in accordance with the standards for development set forth by Section 19.62.060, Maui County Code.

The Site is located in the designated tsunami evacuation zone and may be adversely impacted by a tsunami if one should occur. In the event of a tsunami, Walgreens patrons and employees will be evacuated to safe areas outside the tsunami evacuation zone.

(12) *Substantially affects scenic vistas and view planes identified in County or State plans or studies; or,*

Discussion: Walgreens Kīhei will not impinge upon any significant public scenic view corridors and will have no significant impact on views toward the ocean or Haleakalā. Visual impacts will be mitigated by utilizing setback standards and by providing fences or walls and landscape planting in conformance with Section 19.36A.070, MCC to visually screen and soften the parking lot and building. To mitigate “strip” type visual impacts along South Kīhei Road, the

Walgreens Store will be designed with sensitivity to the pedestrian with a wide meandering sidewalk and appropriate landscaping.

(13) *Requires substantial energy consumption.*

Discussion: Walgreens Kīhei will not require substantial energy consumption. The Store will increase electrical demand slightly; however, it will not significantly increase energy demand beyond current levels.

8.2 DETERMINATION

Pursuant to Chapter 343, HRS, the approving agency has issued an Anticipated Finding of No Significant Impact (A-FONSI) for this draft environmental assessment. This finding is founded on the basis of impacts and mitigation measures examined in this document, public comments received during the pre-consultation and public review phases, and analyzed under the above criteria.

9 CONSULTATION

In the course of planning for Walgreens Kīhei, stakeholder meetings were held and comments were solicited from agencies and community members that may have an interest in the development of Walgreens Kīhei.

9.1 PRE-CONSULTATION

Pre-consultation was conducted prior to preparation of the Draft EA. The purpose of the pre-consultation period is to consult with individuals, community organizations, private groups, and government agencies with technical expertise, or an interest or will be affected by the proposed action. This process is part of the scoping process for the Draft EA. Comments and input received during this period are used to identify environmental issues and concerns to be addressed in the Draft EA, which in turn undergoes a 30-day public comment period.

9.1.1 Written Comments

The Environmental Consultant mailed letters to the following individuals, community organizations, private groups, and government agencies notifying them that an EA was being prepared for Walgreens Kīhei and soliciting any concerns and comments. The comments received and corresponding responses are reproduced in Appendix A.

State of Hawai‘i

- Department of Accounting and General Services
- Department of Business, Economic Development & Tourism (DBEDT)
- DBEDT – Energy Office
- DBEDT – Office of Planning
- Department of Defense
- Department of Education
- Department of Hawaiian Homelands
- Department of Health (DOH)
- Department of Human Services
- Department of Labor and Industrial Relations
- Department of Land and Natural Resources (DLNR)
- DLNR – Historic Preservation Division
- Department of Transportation
- Office of Hawaiian Affairs
- UH Water Resources Research Center

Federal

- U.S. Army Corps of Engineers – Regulatory Branch
- U.S. Fish and Wildlife Service

- Federal Emergency Management Agency

City & County of Honolulu

- Department of Fire and Public Safety
- Department of Environmental Management
- Department of Housing and Human Concerns
- Department of Parks and Recreation
- Department of Public Works
- Department of Transportation
- Department of Water Supply
- Police Department

Elected Officials

- Senator Rosalyn H. Baker
- Representative Kaniela Ing
- County Councilmember Donald G. Couch Jr.

Private Organizations & Individuals

- Hawaiian Telcom
- Maui Electric Company
- Kīhei Community Association

9.1.2 Agency & Community Meetings

PBR Hawaii met with the following agencies and organizations:

- Maui Planning Department
- Maui Department of Public Works
- Kīhei Community Association

9.2 DRAFT ENVIRONMENTAL ASSESSMENT

The Draft EA will be distributed to the following agencies, organizations, and individuals. Comments received on the Draft EA will be included in the Final EA.

State of Hawai‘i

- Department of Accounting and General Services
- Department of Business, Economic Development & Tourism (DBEDT)
- DBEDT – Energy Office
- DBEDT – Office of Planning
- Department of Defense
- Department of Education

- Department of Hawaiian Homelands
- Department of Health (DOH)
- Department of Human Services
- Department of Labor and Industrial Relations
- Department of Land and Natural Resources (DLNR)
- DLNR – Historic Preservation Division
- Department of Transportation
- Office of Hawaiian Affairs
- UH Water Resources Research Center

Federal

- U.S. Army Corps of Engineers – Regulatory Branch
- U.S. Fish and Wildlife Service
- Federal Emergency Management Agency

Maui County

- Department of Fire and Public Safety
- Department of Environmental Management
- Department of Housing and Human Concerns
- Department of Parks and Recreation
- Department of Public Works
- Department of Transportation
- Department of Water Supply
- Police Department

Elected Officials

- Senator Rosalyn H. Baker
- Representative Kaniela Ing
- County Councilmember Donald G. Couch Jr.

Private Organizations & Individuals

- Hawaiian Telcom
- Maui Electric Company
- Kīhei Community Association

Libraries

- Hawaii State Library – Hawaii Documents Center
- Hawaii State Library – Kīhei
- UH Hamilton Library

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Xamanek Researches, LLC. (2005). *An Archaeological Assessment for a portion of land Located in Keokea Ahupua'a, Wailuku District, Island of Maui*. Prepared for: Mr. Jim Stinson/WAISCO, Inc.

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APPENDIX **A**

Consultation

**WALGREENS KIHEI
PRE-CONSULTATION COMMENTS AND RESPONSES**

Agencies/Organizations/Individuals	Pre-Consult	Comment Date
Maui Planning Department/Maui Planning Commission (Approving Agency)	Yes	
OEQC	No	
STATE		
Department of Accounting and General Services	Yes	8/4/2014
Department of Business, Economic Development & Tourism	Yes	
DBEDT - Energy Office	Yes	
DBEDT - Office of Planning	Yes	8/1/2014
Department of Defense	Yes	8/18/2014
Department of Education	Yes	
Department of Hawaiian Home Lands	Yes	
Department of Health - Clean Water Branch	Yes	8/8/2014
Department of Health - Environmental Planning Office	Yes	7/22/2014
Department of Health - Maui District Health Office	Yes	8/4/2014
Department of Human Services	Yes	7/31/2014
Department of Labor and Industrial Relations	Yes	7/28/2014
Department of Land and Natural Resources	Yes	
DLNR - Historic Preservation Division	Yes	
Department of Transportation	Yes	8/11/2014
Office of Hawaiian Affairs	Yes	
UH Water Resources Research Center	Yes	
FEDERAL		
U.S. Army - Engineer Division	Yes	
U.S. Fish and Wildlife Service	Yes	
Federal Emergency Management Agency	Yes	8/15/2014
COUNTY		
Department of Fire and Public Safety	Yes	7/29/2014
Department of Environmental Management	Yes	
Department of Housing and Human Concerns	Yes	7/25/2014
Department of Parks and Recreation	Yes	8/4/2014
Department of Public Works	Yes	7/28/2014
Department of Transportation	Yes	
Department of Water Supply	Yes	8/6/2014
Police Department	Yes	
ELECTED OFFICIALS		
Rep. Kaniela Ing	Yes	
Sen. Rosalyn H. Baker	Yes	
Council Member Donald G. Couch Jr.	Yes	
CITIZEN GROUPS/INDIVIDUALS, CONSULTED PARTIES		
Hawaiian Telcom	Yes	
Maui Electric Company	Yes	
Kihei Community Association	Yes	

NEIL ABERCROMBIE
GOVERNOR



Dean H. Seki
Comptroller
Maria E. Zielinski
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P)1239.4

'AUG 4 2014

Mr. Tom Schnell, AICP
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

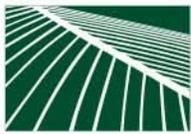
Subject: Pre-Assessment Consultation for Walgreens, Kihei, Maui

Thank you for the opportunity to provide comments for the subject project. This project does not impact any of the Department of Accounting and General Services projects or existing facilities in this area and we have no comments to offer at this time.

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

Sincerely,

DEAN H. SEKI
Comptroller



PBR HAWAII

& ASSOCIATES, INC.

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Associate

March 17, 2015

Mr. Dean H. Seki
State of Hawai'i
Department of Accounting and General Services
P.O. Box 119
Honolulu, HI 96810-0119

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Seki,

Thank you for your letter ((P)1239.4) dated August 4, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA).

As the planning consultant for the applicant, Walgreen of Maui, Inc., we acknowledge that Walgreens Kīhei does not impact any of the Department of Accounting and General Services' (DAGS) projects or existing facilities in the area and that DAGS has no comment to offer at this time.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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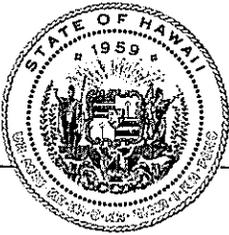
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OFFICE OF PLANNING STATE OF HAWAII

NEIL ABERCROMBIE
GOVERNOR

LEO R. ASUNCION
ACTING DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: <http://planning.hawaii.gov/>

Ref. No. P-14455

August 1, 2014

Mr. Tom Schnell, AICP
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Environmental Assessment Early Consultation for Walgreens Kihei; TMK:
(2) 3-9-007:037, 038, 039, 040 and (2) 3-9-008:016

Thank you for the opportunity to provide comments on the proposed development of Walgreens in Kihei, Maui. We have reviewed the documents sent to our office by letter dated July 16, 2014, and have the following comments to offer:

1. The Office of Planning (OP) provides technical assistance to state and county agencies in administering the statewide planning system in Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Plan. The Hawaii State Plan provides goals, objectives, priorities, and priority guidelines for growth, development, and the allocation of state resources. In particular, the Draft Environmental Assessment (Draft EA) should address how this project meets the Hawaii State Plan's principles to promote sustainability (specifically to promote a diversified and dynamic economy), see HRS § 226-108. The Sustainability Guidelines can be viewed or downloaded from the OP website at http://files.hawaii.gov/dbedt/op/docs/OP_TAM_2013-12-03.pdf
2. OP is the lead agency for the Hawaii Coastal Zone Management (CZM) Program. The coastal zone management area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" see HRS § 205A-1 (definition of "coastal zone management area"). The Draft EA should include a discussion of the proposed project's ability to meet all of the objectives and policies set forth in HRS § 205A-2. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, and marine resources. The Draft EA should include the Coastal Zone Management Act, HRS Chapter 205A, in a list of "relationships to land use plans, policies, and controls."

Mr. Tom Schnell
August 1, 2014
Page 2

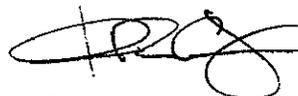
3. The proposed project lies within the Special Management Area (SMA) delineated by the County of Maui. Please consult with the Maui County Department of Planning on the procedures and requirements for addressing SMA regulations.
4. Because of the close proximity to the shoreline, this project may have nonpoint pollution impacts on coastal waters. Please review the Hawaii Watershed Guidance, which provides a summary and links to management measures that may be implemented to minimize coastal nonpoint pollution impact. Specifically, please examine page 120 (management measure for new development). The Watershed Guidance can be viewed or downloaded from the OP website at [http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI_Watershed_Guidance_Final.pdf).
5. Please consider utilizing OP's *Stormwater Impact Assessment* to identify and evaluate information on hydrology (i.e. proximity to drainage ways, stream channels, sensitive ecosystems in receiving waters), stressors (i.e. water quality and pollutants), sensitivity of resources (i.e. aquatic resources and riparian resources), and management considerations. This guidance document will assist in integrating stormwater impact assessment within your review process.

The purpose of this document is to provide guidance on assessing stormwater impacts in the planning phase of project development. The goal is to provide a suggested framework and various tools for integrating stormwater impacts assessment. The Appendices include a list of Data Resources, Best Management Practice Techniques and a Reviewers Checklist. The *Stormwater Impact Assessment* guidance document can be found at

http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf.

If you have any questions regarding this comment letter, please contact Josh Hekekoa of our Hawaii CZM Program at 587-2845.

Sincerely,



Leo R. Asuncion
Acting Director



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March 17, 2015

Mr. Leo R. Asuncion, Acting Director
Office of Planning
State of Hawai'i
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96813

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Asuncion,

Thank you for your letter (Ref. No. P-14455) dated August 1, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

1. We have reviewed the Hawaii State Plan's priority guidelines and principles to promote sustainability as set forth in Section 226-108, Hawaii Revised Statutes. The Draft EA will include discussion on Walgreens Kīhei's contribution to creating a sustainable Hawaii.
2. We acknowledge that the entire State of Hawai'i is located within the Coastal Zone Management Area. As such, the Draft EA will include a discussion of Walgreens Kīhei's ability to meet the Coastal Zone Management objectives and policies found in Hawai'i Revised Statutes §205A.
3. We have consulted with the Maui County Department of Planning on the procedures and requirements for addressing Special Management Area (SMA) regulations. The Draft EA is being submitted in support of a Special Management Area Permit Application. As such, a discussion on how Walgreens Kīhei complies with SMA rules and regulations will be included in the Draft EA.
4. We reviewed the *Hawaii Watershed Guidance* document and management measures to minimize coastal nonpoint source pollution, specifically page 120 (management measure for new development). Walgreens Kīhei will incorporate the following measures regarding stormwater runoff:

- During site development, disturb only the smallest area necessary to perform current activities to reduce erosion and off-site transport of sediment.
- Avoid disturbances of unstable soils or soils particularly susceptible to erosion and sediment loss.
- Revegetate the site as soon as possible after disturbance, preferably with native vegetation.
- Minimize imperviousness to the extent practicable.
- Use pervious pavements for areas of infrequent use.

Mr. Leo R. Asuncion

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

March 17, 2015

Page 2 of 2

5. We reviewed the Office of Planning's *Stormwater Impact Assessment* to help provide a thorough assessment of the area's hydrology, stressors, sensitivity of resources, and management considerations in the Draft EA. The Low Impact Development measures described previously will mitigate for primary, secondary, and cumulative stormwater impacts.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII



Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

NEIL ABERCROMBIE
GOVERNOR



DARRYLL D. M. WONG
MAJOR GENERAL
ADJUTANT GENERAL

JOSEPH K. KIM
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

AUG 18 2014

Mr. Tom Schnell, AICP, Principal
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484

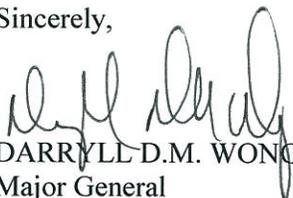
Subject: Pre-Assessment Consultation for Walgreens Kihei, TMK (2) 3-9-007: 037, 038, 039, 040,
and (2) 3-9-008: 016, Kihei, Maui (PBR Hawaii & Associates, Inc. letter dated July 16,
2014)

Dear Mr. Schnell:

Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the project at this time.

Please contact this office upon completion of the Environment Assessment. If you have any questions or concerns, please have your staff contact Mr. Lloyd Maki, our Assistant Chief Engineering Officer, at (808) 733-4250.

Sincerely,


DARRYLL D.M. WONG
Major General
Hawaii National Guard
Adjutant General

c: Mr. Ian Duncan, State Civil Defense



PBR HAWAII

& ASSOCIATES, INC.

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CATIE CULLISON, AICP
Associate

March 17, 2015

Darryl D.M. Wong, Major General
Department of Defense
State of Hawai'i
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Wong,

Thank you for your letter dated August 18, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment.

As the planning consultant for the applicant, Walgreen of Maui, Inc., we acknowledge that the Department of Defense has no comments to offer at this time.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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

In reply, please refer to:
EMD/CWB

08017PJF.14

August 8, 2014

Mr. Tom Schnell
PBR Hawaii & Associates
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

**SUBJECT: Comments on Pre-Assessment Consultation for Walgreens Kihei
Kihei, Island of Maui, Hawaii**

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated July 16, 2014, requesting comments on the subject document. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. Your applicant 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://health.hawaii.gov/epo/files/2013/10/CWB_Oct22.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. National Pollutant Discharge Elimination System (NPDES) permit coverage is required for pollutant discharges into State surface waters and for certain situations involving storm water (HAR, Chapter 11-55).
 - a. Discharges into Class 2 or Class A State waters can be covered under an NPDES general permit only if all of the NPDES general permit requirements are met. Please see the DOH-CWB website (<http://health.hawaii.gov/cwb/>) for the NPDES general permits and instructions to request coverage.

- b. All other discharges into State surface waters and discharges into Class 1 or Class AA State waters require an NPDES individual permit. To request NPDES individual permit coverage, please see the DOH-CWB forms website located at: <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/forms/>.
- c. NPDES permit coverage for storm water associated with construction activities is required if your project will result in the disturbance of one (1) acre or more 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. NPDES permit coverage is required before the start of the construction activities.

Land disturbance includes, but is not limited to clearing, grading, grubbing, uprooting of vegetation, demolition (even if leaving foundation slab), staging, stockpiling, excavation into pavement areas which go down to the base course, and storage areas (including areas on the roadway to park equipment if these areas are blocked off from public usage, grassed areas, or bare ground).

3. If the project involves work in, over, or under waters of the United States, it is highly recommend that your applicant contact the Army Corp of Engineers, Regulatory Branch (Tel: 438-9258) regarding their permitting requirements.

Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (Emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are 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.

Mr. Tom Schnell
August 8, 2014
Page 3

08017PJF.14

If you have any questions, please visit our website at: <http://health.hawaii.gov/cwb>, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,



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

JF:bk



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& ASSOCIATES, INC.

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March 17, 2015

Mr. Alec Wong, P.E., Chief
Department of Health – Clean Water Branch
State of Hawai'i
P.O. Box 3378
Honolulu, HI 96801-3378

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Wong,

Thank you for your letter (08017PJF.14) dated August 8, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreens of Maui, Inc., we are responding to your comments.

We reviewed and understand the standard comments provided on your website. In addition, we have addressed your specific comments below.

1. The Draft EA acknowledges that the type and classification of State waters off the coast of Kīhei is "A". Any potential impacts to these waters caused by the construction and/or operation of the Walgreens Store will meet the provisions of the:

- a) Anti-degradation policy (Chapter 11-54-1.1, Hawaii Administrative Rules (HAR));
- b) Designated uses (Chapter 11-54-3, HAR); and
- c) Water quality criteria (Chapter 11.54-4 through 11-54-8, HAR).

However, direct discharges of stormwater runoff into marine waters are not expected to occur due to the store's distance from the coast.

2. A National Pollutant Discharge Elimination System (NPDES) permit for discharges of storm water runoff into State surface waters (Chapter 11-55, HAR) will be obtained as required. All NPDES permit requirements will be implemented.
3. Pursuant to the "Clean Water Act," a Section 401 Water Quality Certification from the State Department of Health, Clean Water Branch will be obtained as required.
4. All discharges related to the construction and operation of Walgreens Kīhei will comply with the State's Water Quality requirements contained in Chapters 11-54 and 11-55, HAR. In accordance with County standards, all runoff due to Walgreens Kīhei will be detained on-site.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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

In reply, please refer to:
File:
EPO 14-155

July 22, 2014

PBR HAWAII & Associates
Attn: Tom Schnell, AICP
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

SUBJECT: Pre-Assessment Consultation for Walgreens Kihei

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter to the Director dated July 16, 2014. Thank you for allowing us to review and comment on the subject document. The document was forwarded to the Maui District Health Office and the Clean Water Branch. They will provide specific comments to you if necessary. EPO recommends that you review the standard comments at: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/>. You are required to adhere to all applicable standard comments.

You may also wish to review the recently revised Water Quality Standards Maps that have been updated for all islands. The new Water Quality Standards Maps can be found at:
<http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/>.

The EPO suggests that you examine the many sources available on strategies to support the sustainable and healthy design of communities and buildings, including the:

State of Hawaii, Office of Planning: www.planning.hawaii.gov and the 2013 ORMP;

U.H., School of Ocean and Earth Science and Technology: www.soest.hawaii.edu;

2014 National Climate Change Report – Highlights for Hawaii:

http://ipcc-wg2.gov/AR5/images/uploads/WGIAR5-Chap29_FGDall.pdf;

U.S. Health and Human Services: www.hhs.gov/about/sustainability;

U.S. Environmental Protection Agency's sustainability programs: www.epa.gov/sustainability;

U.S. Green Building Council's LEED program: www.usgbc.org/leed;

Smart Growth America: www.smartgrowthamerica.org;

International Well Building Standard: <http://delosliving.com>; and

Intergovernmental Panel on Climate Change (IPCC):

http://ipcc-wg2.gov/AR5/images/uploads/WGIAR5-Chap29_FGDall.pdf

The DOH encourages everyone to apply these sustainability strategies and principles early in the planning and review of projects.

We request you share all of this information with others to increase community awareness on sustainable, innovative, inspirational, and healthy community design.

Mahalo,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

- c. Patricia Kitkowski, Maui District Health Office
Alec Wong, Clean Water Branch



PBR HAWAII

& ASSOCIATES, INC.

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March 17, 2015

Ms. Laura Leialoha Phillips McIntyre, Program Manager
State of Hawai'i
Department of Health
Environmental Planning Office
P.O. Box 3378
Honolulu, HI 96801-3378

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Ms. McIntyre,

Thank you for your letter (EPO 14-155) dated July 22, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreens, we are responding to your comments.

We reviewed the Environmental Planning Office's (EPO) standard comments relating to Environmental Health programs. We understand that all standard comments specifically applicable to Walgreens Kīhei must be adhered to. The organization of this letter follows the list of standard comments on your website.

Clean Air Branch

We acknowledge that there is a potential for fugitive dust emissions during all phases of construction and operations. The Draft EA will address construction-related impacts related to fugitive dust. All construction activities will comply with the provisions of Section 11-60.1-33, Hawaii Administrative Rules (HAR) related to Fugitive Dust. Adequate measures to control dust during various phases of construction will be required to be implemented by the contractor employed by Walgreens to effect the store's development.

Clean Water Branch

We reviewed and understand the standard comments provided by the Clean Water Branch (CWB).

- 1. Potential Impacts to State Waters.** The Draft EA acknowledges the type and classification of State waters off the coast of Kīhei is "A". Any potential impacts to these waters caused by the construction and/or operation of the Walgreens Store will meet the provisions of the: a) antidegradation policy (Chapter 11-54-1.1, HAR); b) designated uses (Chapter 11-54-3, HAR); and c) water quality criteria (Chapter 11.54-4 through 11-54-8, HAR). However, direct discharges of stormwater runoff into marine waters are not expected to occur due to the store's distance from the coast.
- 2. National Pollutant Discharge Elimination System permit coverage.** A National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (Chapter 11-55, HAR) will be obtained. All NPDES permit requirements will be implemented.

Hazard Evaluation and Emergency Response Office

We understand that the Hazard Evaluation and Emergency Response (HEER) Office provides leadership, support, and partnership in preventing, planning for, responding to, and enforcing environmental laws relating to releases or threats of releases of hazardous substances. We do not expect hazardous substances, pollutants, or contaminants to be present at the Walgreens

Ms. McIntyre

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

March 17, 2015

Page 2 of 3

Store site. However, if any of these are found at the site, HEER will be contacted to determine the appropriate actions to comply with the relevant environmental laws.

Noise, Radiation, & Indoor Air Quality Branch

Walgreens Store activities will comply with the following Hawaii Administrative Rules:

- Chapter 11-39 Air conditioning and Ventilation
- Chapter 11-45 Radiation Control
- Chapter 11-46 Community Noise Control

In addition, Walgreens Store operations will comply with HAR Chapters 11-501 through 11-504 regarding asbestos. However, since there are no existing structures or buildings within the project area, the presence of asbestos is not expected.

Safe Drinking Water Branch

We note that the Safe Drinking Water Branch administers programs to protect drinking water sources from contamination.

1. **Public Water System.** A public water system will not be developed as part of the Walgreens Store. Potable water will be supplied by the County Department of Water Supply, which draws water from a series of surface water sources and groundwater wells.
2. **Underground Injection Control.** Wastewater generated by the Walgreens Store will be collected by the County wastewater system.

Solid and Hazardous Waste Branch

Solid waste that cannot be recycled will be disposed of at the Central Maui Landfill. Waste contractors will be asked to submit disposal receipts and invoices to ensure proper disposal of waste. The Walgreens Store will also comply with the provisions of Section 11-260 to 11-280, Hawaii Administrative Rules, relating to hazardous waste.

Wastewater Branch

The Walgreens Store will connect to the County wastewater system. Wastewater generated onsite will be collected by the County wastewater system. No cesspool is being proposed.

Sustainable and Healthy Design

We have examined the available resources on strategies to support the sustainable and healthy design of communities and buildings. As such, the following concepts will be incorporated into the development of Walgreens Kīhei.

- Implement best management practices to reduce pollutant loads (ORMP)
- Incorporate green building specifications into all new construction and major renovation projects (US HHS)
- Develop and deploy operational controls for leak detection including a distribution system audit, leak detection, and repair programs. (US HHS)
- Design, install, and maintain landscape to reduce water use (US HHS).

Ms. McIntyre

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

March 17, 2015

Page 3 of 3

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

A handwritten signature in black ink that reads "Keli Kapali". The signature is written in a cursive, flowing style.

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission



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

August 4, 2014

Mr. Tom Schnell, AICP
Principal
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dr. Mr. Schnell:

Subject: Pre-Assessment Consultation for Walgreens Kihei
TMK: (2) 3-9-008:016 and 3-9-007:037 to 040

Thank you for the opportunity to review this project. We have the following comments to offer:

1. The noise created during the construction phase of the project may exceed the maximum allowable levels as set forth in Hawaii Administrative Rules (HAR), Chapter 11-46, "Community Noise Control." A noise permit may be required and should be obtained before the commencement of work. The Indoor & Radiological Health Branch should be contacted at 808 586-4700.
2. This project must discharge all wastewater into the County sewer.

It is strongly recommended that the Standard Comments found at the Department's website: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/> 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 or E-mail me at patricia.kitkowski@doh.hawaii.gov.

Sincerely,

Patti Kitkowski
District Environmental Health Program Chief



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March 17, 2015

Ms. Patti Kitkowski, Program Chief
Department of Health – Maui District Health Office
State of Hawai'i
54 High Street
Wailuku, HI 96793

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Ms. Kitkowski,

Thank you for your letter dated August 4, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

1. Walgreens Store activities will comply with Chapter 11-46 Community Noise Control, Hawaii Administrative Rules. If construction noise is expected to exceed the Department of Health's (DOH) allowable noise limits, a permit will be obtained from DOH and the Indoor & Radiological Health Branch will be contacted.
2. Walgreens Kīhei will connect to the County wastewater system. Wastewater generated onsite will be collected by the County wastewater system.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
Benefit, Employment & Support Services Division
820 Mililani Street, Suite 606
Honolulu, Hawaii 96813

July 31, 2014

Refer to 14:0477

Mr. Tom Schnell, AICP
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Thank you for your letter dated July 16, 2014 that requests the Department of Human Services (DHS) input to whether the proposed Walgreens store in Kihei, Maui may have an impact on any of our existing or proposed projects, plans, policies, or programs as part of the Pre-Assessment Consultation. The Director of the DHS has forwarded your letter to me for a response.

After a review of the proposed project area, we do not have any comments or concerns at this time. We, also, do not foresee any impact on any child care services in the community.

If you have any questions or need further information, please contact Ms. Kathy Ochikubo, Child Care Program Specialist, at (808) 586-7110.

Sincerely,

Scott Nakasone
Assistant Division Administrator

c: Patricia McManaman, DHS Director



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Associate

CATIE CULLISON, AICP
Associate

March 17, 2015

Mr. Scott Nakasone, Assistant Division Administrator
Department of Human Services
State of Hawai'i
820 Mililani Street, Suite 606
Honolulu, Hawaii 96813

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Nakasone,

Thank you for your letter (14.0477) dated July 31, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

We acknowledge that the Department of Human Services (DHS) does not have any comments or concerns at this time and that DHS does not foresee any impact on any child care services in the community.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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NEIL ABERCROMBIE
GOVERNOR



DWIGHT TAKAMINE
DIRECTOR

JADE T. BUTAY
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

830 PUNCHBOWL STREET, ROOM 321
HONOLULU, HAWAII 96813
www.hawaii.gov/labor
Phone: (808) 586-8844/Fax: (808) 586-9099

July 28, 2014

PBR HAWAII
ATTN: Tom Schnell, AICP
1001 Bishop Street, Suite 650
Honolulu, HI 96813

Dear Mr. Tom Schnell:

This is in response to your request for comments dated July 16, 2014 on the Environmental Assessment report for the Pre-Assessment Consultation for Walgreens in Kihei.

The Department of Labor and Industrial Relations has no comments, and we foresee no impact on our existing or proposed programs. Should you have any questions, please call me at (808) 586-8844.

Sincerely,


Dwight Takamine
Director



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MARC SHIMATSU, ASLA
Associate

CATIE CULLISON, AICP
Associate

March 17, 2015

Dwight Takamine, Director
Department of Labor and Industrial Relations
State of Hawai'i
830 Punchbowl Street, Room 321
Honolulu, Hawaii 96813

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Takamine,

Thank you for your letter dated July 28, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

We acknowledge that the Department of Labor and Industrial Relations (DLIR) has no comments and does not foresee any impact on DLIR's existing or proposed programs.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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

FORD N. FUCHIGAMI
INTERIM DIRECTOR

Deputy Directors
RANDY GRUNE
AUDREY HIDANO
ROSS M. HIGASHI
JADINE URASAKI

IN REPLY REFER TO:
STP 8.1640

August 11, 2014

Mr. Tom Schnell, AICP
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Walgreens Kihei
Pre-Assessment Consultation for Draft Environmental Assessment
TMK: (2) 3-9-007:037-040 and (2) 3-9-008:016

Our Department of Transportation's (DOT) comment on the subject project are as follows:

The Draft Environmental Assessment (DEA) should discuss and evaluate the project's contribution to the cumulative traffic impacts on State highways facilities in the area.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,


FORD N. FUCHIGAMI
Interim Director of Transportation



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March 17, 2015

Ford Fuchigami, Director
Department of Transportation
State of Hawai'i
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Fuchigami,

Thank you for your letter (STP 8.1640) dated August 11, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

The nearest State Highway to Walgreens Kīhei is Pi'ilani Highway. Pi'ilani Highway is a major thoroughfare that provides regional access to Kīhei and Wailea.

The Draft EA will include a traffic impact assessment report (TIAR). The TIAR study area was defined after consultation with County of Maui Department of Public Works and review of other traffic studies for projects in the area and includes the following intersections:

- South Kīhei Road at Lipoa Street
- South Kīhei Road at Piikea Avenue
- South Kīhei Road at McDonald's/Longs Driveway
- South Kīhei Road at Nohokai Street
- South Kīhei Road at Kauhaa Street
- South Kīhei Road at Waipuilani Road

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052



FEMA

August 15, 2014

Tom Schnell, AICP
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

This is in response to your request for comments regarding the Pre-Assessment Consultation for Walgreens Ki'Hei, in the County of Maui, Hawaii.

Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Maui (Community Number 150003), Maps revised September 19, 2012. Please note that the Maui County, Hawaii is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.
- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

Tom Schnell, AICP
Page 2
August 15, 2014

- All buildings constructed within a coastal high hazard area, (any of the “V” Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.
- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA’s Flood Map Revision Application Packages, please refer to the FEMA website at <http://www.fema.gov/business/nfip/forms.shtm>.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community’s floodplain manager for more information on local floodplain management building requirements. The Maui County floodplain manager can be reached by calling Carolyn Cortez, Floodplain Administrator, at (808) 270-7253.

If you have any questions or concerns, please do not hesitate to call Sarah Owen of the Mitigation staff at (510) 627-7050.

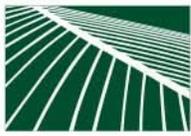
Sincerely,



Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:

Carolyn Cortez, Floodplain Administrator, County of Maui
Carol Tyau-Beam, NFIP Coordinator, State of Hawaii
Sarah Owen, NFIP Planner, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX



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March 17, 2014

Mr. Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch
U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Blackburn

Thank you for your letter dated August 15, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

We have reviewed the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Maui (Community Number 150003). Walgreens Kīhei is located within Flood Zone AH and will comply with all requirements as described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

Elevations at the Site range from 3-4 feet above mean sea level. The base flood elevation is six feet. Ground elevations at the Site will be modified to create suitable areas for the Walgreens store and parking lot. At the same time, certain areas will be excavated to offset the amount of displaced drainage capacity caused by those modifications. The overall grading will not increase base flood elevation levels.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

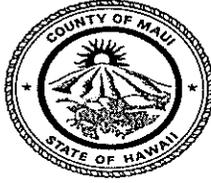
PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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ALAN M. ARAKAWA
MAYOR



JEFFREY A. MURRAY
FIRE CHIEF

ROBERT M. SHIMADA
DEPUTY FIRE CHIEF

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

313 MANEA PLACE . WAILUKU, HAWAII 96793
(808) 244-9161 . FAX (808) 244-1363

July 29, 2014

PBR Hawaii & Associates, Inc.
Attn: Tom Schnell, AICP
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Re: Pre-Assessment Consultation for Walgreens Kihei
(2) 3-9-007: 037; (2) 3-9-007: 038; (2) 3-9-007: 039; & (2) 3-9-008: 016

Dear Tom:

Thank you for allowing The Department of Fire & Public Safety the opportunity to comment on this subject. At this time, our office provides the following comments:

- Our office has no comment in regards to the pre-assessment consultation associated with this project.
- Our office does reserve the right to comment on the proposed project during the building permit review process when fire department access, water supply for fire protection, and fire and life safety requirements will be addressed.

If there are any questions or comments, please feel free to contact me at 244-9161 ext. 23.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Haake".

Paul Haake
Captain, Fire Prevention Bureau



PBR HAWAII

& ASSOCIATES, INC.

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Associate

DACHENG DONG, LEED®AP
Associate

MARC SHIMATSU, ASLA
Associate

CATIE CULLISON, AICP
Associate

March 17, 2015

Paul Haake, Captain
Department of Fire and Public Safety
Fire Prevention Bureau
County of Maui
313 Manea Place
Wailuku, Hawaii 96793

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Captain Haake,

Thank you for your letter dated July 29, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA).

As the planning consultant for the applicant, Walgreen of Maui, Inc., we acknowledge that the Department of Fire and Public Safety has no comment to offer at this time.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

HONOLULU OFFICE

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DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

ALAN M. ARAKAWA
Mayor
JO-ANN T. RIDAO
Director
JAN SHISHIDO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

July 25, 2014

Mr. Tom Schnell, AICP
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Schnell:

Subject: Pre-assessment Consultation for Walgreens Kihei, Kihei, Maui, Hawaii. TMK (2) 3-9-007:037, 038, 039, 040 and (2) 3-9-008:016

The Department has reviewed the Pre-Assessment Consultation for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. At the present time, the Department has no additional comments to offer.

Please call Mr. Veranio Tongson Jr. of our Housing Division at (808) 270-1741 if you have any questions.

Sincerely,

WAYDE T. OSHIRO
Housing Administrator

cc: Director of Housing and Human Concerns



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Associate

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Associate

MARC SHIMATSU, ASLA
Associate

CATIE CULLISON, AICP
Associate

March 17, 2015

Mr. Wayde T. Oshiro
Department of Housing and Human Concerns
County of Maui
35 Lunalilo Street, Suite 102
Wailuku, HI 96793

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Oshiro,

Thank you for your letter dated July 25, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

We acknowledge that Walgreens Kīhei is not subject to Chapter 2.96, Maui County Code and that the Department of Housing and Human Concerns has no comments to offer at this time.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
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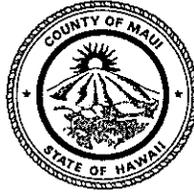
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ALAN M. ARAKAWA
Mayor



BRIANNE L. SAVAGE
Interim Director

(808) 270-7230
FAX (808) 270-7934

DEPARTMENT OF PARKS & RECREATION
700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

August 4, 2014

PBR Hawaii & Associates, Inc.
Attn: Tom Schnell, AICP
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Schnell:

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KIHEI

Thank you for the opportunity to review and comment on the proposed project. Our Department has no comments to offer at this time.

If there are any questions, please feel free to contact me or Karla Peters, CIP Coordinator, at (808)270-7981 or karla.peters@co.maui.hi.us.

Sincerely,

A handwritten signature in cursive script that reads "Brianne Savage".

BRIANNE L. SAVAGE
Interim Director of Parks & Recreation

c: Robert Halvorson, Chief of Planning and Development

BLS:RH:kp



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& ASSOCIATES, INC.

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Associate

DACHENG DONG, LEED®AP
Associate

MARC SHIMATSU, ASLA
Associate

CATIE CULLISON, AICP
Associate

March 17, 2015

Kaala Buenconsejo, Director
Department of Parks and Recreation
County of Maui
700 Hali'a Nakoia Street, Unit 2
Wailuku, Hawaii 96793

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Ms. Buenconsejo,

We received your Department's letter dated August 4, 2014 from Interim Director Brianne L. Savage, regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA).

As the planning consultant for the applicant, Walgreen of Maui, Inc., we acknowledge that the Department of Parks and Recreation has no comments to offer at this time.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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ALAN M. ARAKAWA
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DAVID C. GOODE
Director

ROWENA M. DAGDAG-ANDAYA
Deputy Director



GLEN A. UENO, P.E., P.L.S.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
DEVELOPMENT SERVICES ADMINISTRATION
250 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

July 28, 2014

Mr. Tom Schnell, AICP, Principal
PBR HAWAII & ASSOCIATES, INC.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS
KIHEI; TMK: (2) 3-9-007:037, 038, 039, 040 AND
(2) 3-9-008:016**

We reviewed your pre-assessment consultation request and have the following comments:

Comment from the Development Services Administration (DSA), Building Inspection Section:

1. There is one Request for Service, RFS No. 10-0001317, still open. No open building permits.

Comments from the Engineering Division:

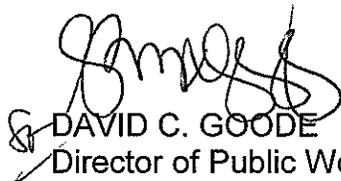
2. The applicant shall be responsible for all required improvements, as required by Hawaii Revised Statutes, Maui County Code and rules and regulations.
3. As applicable, construction plans shall be designed in conformance with Hawaii Standard Specifications for Road and Bridge Construction dated 2005 and Standard Details for Public Works Construction, 1984, as amended.
4. As applicable, worksite traffic-control plans/devices shall conform to "Manual on Uniform Traffic Control Devices for Streets and Highways", 2003.

Mr. Tom Schnell, AICP, Principal
July 28, 2014
Page 2

5. The applicant shall provide a comprehensive drainage report with solution to address post development storm water increase. Also, the proposed drainage plan cannot alter existing drainage patterns if it negatively impacts downstream properties.

Please call Rowena M. Dagdag-Andaya at (808) 270-7845 if you have any questions regarding this letter.

Sincerely,

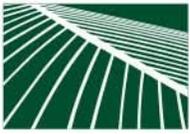


DAVID C. GOODE
Director of Public Works

DCG:RMDA:da

xc: Highways Division
Engineering Division

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& ASSOCIATES, INC.

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Tel/Cel: (808) 315-6878

March 17, 2015

David Goode, Director
Department of Public Works
Development Services Administration
County of Maui
250 South High Street
Wailuku, Hawaii 96793

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Goode,

Thank you for your letter dated July 28, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to the comments from the Building Inspection Section and Engineering Division.

Building Inspection Section

1. Thank you for the information regarding Request for Service, RFS No. 10-0001317.

Engineering Division

2. Walgreens Kīhei will provide all improvements required by Hawaii Revised Statutes, Maui County Code, and other rules and regulation.
3. Construction plans will be designed in conformance with Hawaii Standard Specifications for Road and Bridge Construction and Standard Details for Public Works Construction in effect at the time of development.
4. Worksite traffic-control plans/devices will conform to the "Manual on Uniform Traffic Control Devices for Streets and Highways", 2003, as applicable.
5. A comprehensive drainage report has been prepared and be included in the Draft Environmental Assessment (EA).

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

ALAN M. ARAKAWA
Mayor



DAVID TAYLOR, P.E.
Director

PAUL J. MEYER
Deputy Director

**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI**

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauewater.org

August 6, 2014

Mr. Tom Schnell, AICP
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KIHEI
TMKs: 3-9-007:037, 3-9-007:038, 3-9-007:039, 3-9-007:040, AND 3-9-008:016

Dear Mr. Schnell,

Thank you for consulting with us on preparation of an Environmental Assessment (EA), Change in Zoning and Special Management Area (SMA) Use Permit.

There is a 1 ½ inch meter and a 5/8 inch meter serving parcel 3-9-008:016. A 6-inch water line fronts the subject properties along South Kihei Road and Nohokai Street. System improvements and meter adequacy will be determined in the subdivision/consolidation process and building permit process. Unless all lots are consolidated, water service to any lot requires a separate water meter. The project site is within approximately 900 feet from a reclaimed water line along East Waipuilani Road.

Conservation

The following conservation measures should be considered and incorporated into the EA to mitigate potable and non-potable demand for this project:

Indoor Conservation Measures:

- a. Use EPA WaterSense labeled plumbing fixtures.
- b. Install flow reducers and faucet aerators in all plumbing fixtures where-ever possible.
- c. Install dual flush toilets with high efficiency models that use 1.28 gallons per flush or less.
- d. Install showerheads with a flow rate of 1.5 gpm at 60 psi or less.
- e. Install bathroom sink faucets with fixtures that do not exceed 1 gpm at 60 psi. Laundry facilities and/or individual unit machines must use Energy Star labeled washers.
- f. Limit the distance from the hot water source to the tap early in the design stage.

"By Water All Things Find Life"

Exterior Areas:

- a. Install infrastructure necessary to utilize a future connection to reclaimed water line
- b. Use Smart Approved WaterMark irrigation products. Examples include ET irrigation controllers, drip irrigation, and water saving spray heads.
- c. Avoid plant fertilizing and pruning that would stimulate excessive growth. Time watering to occur in the early morning or evening to limit evaporation. Limit turf to as small an area as possible

Should you have any questions on system improvements, please contact our engineering division at (808)270-7835. For any water resources questions, please contact Staff Planner Eva Blumenstein at (808) 463-3102 or eva.blumenstein@co.maui.hi.us.

Sincerely,



David Taylor, Director
emb

Attachments:

c: engineering



PBR HAWAII

& ASSOCIATES, INC.

PRINCIPALS

THOMAS S. WITTEN, ASLA
Chairman

R. STAN DUNCAN, ASLA
President

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TOM SCHNELL, AICP
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1719 Haleloke Street
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Tel/Cel: (808) 315-6878

March 17, 2015

David Taylor, Director
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Hawaii 96793-2155

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR WALGREENS KĪHEI

Dear Mr. Taylor,

Thank you for your letter dated August 6, 2014 regarding the pre-consultation for the Walgreens Kīhei Draft Environmental Assessment (EA). As the planning consultant for the applicant, Walgreen of Maui, Inc., we are responding to your comments.

Thank you for providing information on the existing water infrastructure within the vicinity of the Site. We understand that system improvements and meter adequacy will be determined during the building permit process. We acknowledge that water service to any lot requires a separate water meter unless all lots are consolidated.

Conservation measures listed in your letter will be noted in the Draft EA and considered for inclusion at Walgreens Kīhei to minimize the increase in potable and non-potable water demand.

Thank you for participating in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Tammy Keli'i Kapali
Planner

cc: Maui Planning Department/Maui Planning Commission

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APPENDIX **B**

Flora & Fauna Survey

BOTANICAL AND FAUNA SURVEY

for

THE KIHEI WALGREENS PROJECT

KIHEI, MAUI

by

ROBERT W. HOB DY
Environmental Consultant
Kokomo, Maui
June 2014

Prepared for: Mulvanny G2 Architecture

BOTANICAL AND FAUNA SURVEY
KIHEI WALGREEN PROJECT
KIHEI, MAUI

INTRODUCTION

The Kihei Walgreens project lies on approximately 2 acres of undeveloped land along South Kihei Road in Waiohuli, South Maui (TMKs (2) 3-9-07:37,38,39,40 and (2) 3-9-08:16) (see Figures 1 & 2). The project calls for the development of a Walgreens store with adjacent parking. This study was initiated by the owners in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

The Kihei Walgreens Project fronts 328 feet of the Lower (west) side of South Kihei Road. Its northern boundary is Nohokai Street, its southern boundary is a Mc Donalds restaurant property and its western boundary is adjacent to residential properties. The parcels were cleared many years ago by previous owners and covered with gravel to make the surface useable. About 90% of the property is covered with this gravel surface. A few trees and shrubs grow around the borders.

The land is almost level throughout with elevations ranging from 4 to 6 feet above sea level. The soil below the gravel surface is Jaucas sand, saline, 0 – 12% slopes (JcC) with a water table within 30 inches of the surface (Foote et al, 1972). The property lies behind a low coastal dune between 700 feet and 1,000 feet from the ocean. Rainfall averages 8 – 10 inches per year with winter maximums (Armstrong, 1983).

A portion of the property is presently being used as an outdoor crafts market place.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the proposed Kihei Walgreens Project which was conducted in June 2014.

The objectives of the survey were to:

1. Document what plant and animal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used covering the entire project area. Notes were made on species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF THE VEGETATION

The project area is mostly covered in gravel but a few large ironwood trees (*Casuarina equisetifolia*) grow on the southern portion and the western border consists primarily of kiawe trees (*Prosopis pallida*) and Indian fleabane shrubs (*Pluchea indica*).

A total of 23 plant species were identified during the course of the survey. Of these, four species were common indigenous plants 'aki'aki (*Sporobolus virginicus*), 'ākulikuli (*Sesuvium portulacastrum*), kipukai (*Heliotropium curassavicum*) and milo (*Thespesia populnea*). One species, niu or coconut (*Cocos nucifera*), was a Polynesian introduction. The remaining eighteen species were non-native ornamentals or weeds.

DISCUSSION AND RECOMMENDATIONS

This project area has been previously converted to human uses in this urban environment and little remains of a natural environment. Just four common indigenous coastal plant species occur here. These species are common throughout the tropical Pacific and are of no particular conservation concern. No Endangered or Threatened native species were found, nor were any that are candidates for such status found. No important native plant habitats occur here either.

The proposed project is not expected to have a significant negative impact on the botanical resources in this part of Maui.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within two groups: Monocots and Dicots. Taxonomy and nomenclature of the flowering plants (Monocots and Dicots) are in accordance with Wagner et al. (1999).

For each species, the following information is provided:

1. Scientific name with author citation
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:

endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

Polynesian = plants brought to these islands by the Polynesians during the course of their migrations.

non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

abundant = forming a major part of the vegetation within the project area.

common = widely scattered throughout the area or locally abundant within a portion of it.

uncommon = scattered sparsely throughout the area or occurring in a few small patches.

rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MONOCOTS			
ARECACEAE (Palm Family)			
<i>Cocos nucifera</i> L.	niu, coconut	Polynesian	rare
<i>Dypsis lutescens</i> (Wendl.) Beentje & Dransfield	golden-fruited palm	non-native	rare
<i>Washingtonia filifera</i> H. Wendland	California Washingtonia	non-native	uncommon
POACEAE (Grass Family)			
<i>Cenchrus barbata</i> (L.) Sw.	swollen fingergrass	non-native	uncommon
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	non-native	uncommon
<i>Eleusine indica</i> (L.) Gaertn.	wiregrass	non-native	rare
<i>Sporobolus virginicus</i> (L.) Kunth	'aki'aki	indigenous	uncommon
DICOTS			
AIZOACEAE (Fig-marigold Family)			
<i>Sesuvium portulacastrum</i> (L.) L.	'ākulikuli	indigenous	common
AMARANTHACEAE (Amaranth Family)			
<i>Alternanthera pungens</i> Kunth	khaki weed	non-native	rare
<i>Amaranthus viridis</i> L.	slender amaranth	non-native	rare
ANACARDIACEAE (Mango Family)			
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	non-native	rare
APOCYNACEAE (Dogbane Family)			
<i>Calotropis procera</i> (Aiton) Aiton	small crown flower	non-native	rare
ARALIACEAE (Ginseng Family)			
<i>Polyscias guilfoylei</i> (W.Bull) L.H. Bailey	panax	non-native	uncommon
ASTERACEAE (Sunflower Family)			
<i>Lactuca sativa</i> L.	prickly lettuce	non-native	rare
<i>Pluchea indica</i> (L.) Less.	Indian fleabane	non-native	common
BATAACEAE (Saltwort Family)			
<i>Batis maritima</i> L.	pickleweed	non-native	uncommon
BORAGINACEAE (Borage Family)			
<i>Heliotropium curassavicum</i> L.	kipūkai	indigenous	uncommon
CASUARINACEAE (She-oak Family)			
<i>Casuarina equisetifolia</i> L.	common ironwood	non-native	uncommon
FABACEAE (Pea Family)			
<i>Desmanthus pernambucanus</i> (L.) Thellung	slender mimosa	non-native	rare
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	kiawe	non-native	common
MALVACEAE (Mallow Family)			
<i>Thespesia populnea</i> (L.) Sol. ex Correa	milo	indigenous	uncommon
MORINGACEAE (Drumstick Tree Family)			
<i>Moringa oleifera</i> Lamorck	horseradish tree	non-native	rare
PASSIFLORACEAE (Passion Flower Family)			
<i>Passiflora edulis</i> Sims	passion fruit	non-native	rare

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through fauna survey method was conducted in conjunction with the botanical survey. All parts of the project area were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition an evening visit was made to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the area.

RESULTS

MAMMALS

Just two common non-native urban mammals were recorded during three site visits to the project area. Taxonomy and nomenclature follow Tomich (1986). A few domestic cats (*Felis catus*) were seen prowling around dumpsters and hunting for rodents during the evening. One roof rat (*Rattus rattus*) was seen during the evening. Other non-native mammals one might expect to see in this area include the mongoose (*Herpestes auropunctatus*), the house mouse (*Mus domesticus*) and domestic dogs (*Canis familiaris*).

A special effort was made to look for the native Hawaiian hoary bat which is listed as an Endangered species. These bats have been observed in the past around the Waiakoa Stream estuary about 2 miles north of the property. When present in an area these bats can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. No evidence of such activity was observed though visibility was excellent. In addition a bat detection device (Batbox IIID) was employed, set to the frequencies of 27,000 to 28,000 hertz which this species is known to use to echolocate for flying insect prey. No bats were detected using this device.

BIRDS

Birdlife was sparse in species diversity. Only five non-native bird species were recorded during three site visits. Taxonomy and nomenclature follow American Ornithologists' Union (2013). Most common were the zebra dove (*Geopelia striata*), common myna (*Acridotheres tristis*) and chicken (*Gallus gallus*). Less common were house sparrow (*Passer domesticus*) and red-crested cardinal (*Paroaria coronata*). Other non-native birds likely to utilize this area include house finch (*Carpodacus mexicanus*), Japanese white-eye (*Zosterops japonicus*), northern cardinal (*Cardinalis cardinalis*) and nutmeg mannikin (*Lonchura punctulata*). This habitat is not suitable for Hawaii's native forest birds that are restricted to higher elevation native forests that are beyond the range of mosquitoes and the deadly avian diseases they carry and transmit. The property also has no habitat for Hawaii's Endangered waterbirds or the Endangered nēnē goose, and none were seen.

REPTILES

One non-native mourning gecko (*Lepidodactylus lugubris*) was heard from kiawe trees during the evening survey.

INSECTS

Insect life was somewhat sparse due to the general lack of vegetation. Eight species were recorded in the project area during three site visits. Taxonomy and nomenclature follow Nishida et al (1992). Most abundant was the dung fly (*Musca sorbens*). Four species were uncommon and three species were rare (see species inventory). One native dragonfly was recorded, the indigenous globe skimmer (*Pantala flavescens*). This dragonfly is common in Hawaii as well as throughout the tropics worldwide.

DISCUSSION AND RECOMMENDATIONS

The animal species recorded during this survey were almost entirely non-native mammals, birds, reptiles and insects. The only native species found was the common indigenous globe skimmer dragonfly which is of no conservation focus or concern. The habitat here is already urban in character.

The proposed project is not expected to have a significant negative impact on the fauna resources in this part of Maui.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within four groups: Mammals, Birds, Reptiles and Insects. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:

endemic = native only to Hawaii; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.

migratory = spending a portion of the year in Hawaii and a portion elsewhere.
In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.

4. Abundance of each species within the project area:

abundant = many flocks or individuals seen throughout the area at all times of day.

common = a few flocks or well scattered individuals throughout the area.

uncommon = only one flock or several individuals seen within the project area.

rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MAMMALS			
<i>Felis catus</i> L.	domestic cat	non-native	uncommon
<i>Rattus rattus</i> L.	roof rat	non-native	uncommon
BIRDS			
<i>Geopelia striata</i> L.	zebra dove	non-native	common
<i>Gallus gallus</i> L.	chicken	non-native	common
<i>Acridotheres tristis</i> L.	common myna	non-native	common
<i>Passer domesticus</i> L.	house sparrow	non-native	uncommon
<i>Paroaria coronata</i> Miller	red-crested cardinal	non-native	uncommon
REPTILE			
<i>leipodactylus lugubris</i> Dumeril & Bibron	mourning gecko	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
INSECTS			
Order COLEOPTERA - beetles			
CUCURLIONIDAE (Weevil Family)			
<i>Xyleborus</i> sp.	powder post beetle sp.	non-native	uncommon
Order DIPTERA - flies			
MUSCIDAE (House Fly Family)			
<i>Musca sorbens</i> Wiedemann	dung fly	non-native	abundant
Order HYMENOPTERA - bees, wasps, ants			
FORMICIDAE (Ant Family)			
<i>Pheidole megacephala</i> Fabricius	big-headed ant	non-native	rare
Order LEPIDOPTERA - butterflies, moths			
LYCAENIDAE (Gossamer-winged Butterfly Family)			
<i>Brephidium exilis</i> Boisduval	western pygmy blue	non-native	uncommon
<i>Lampides boeticus</i> L.	long tail blue butterfly	non-native	rare
PAPILIONIDAE (Swallowtail Butterfly Family)			
<i>Papilio xuthus</i> L.	Asian swallowtail	non-native	rare
PIERIDAE (Small white and Sulphur Butterfly Family)			
<i>Pieris rapae</i> L.	cabbage butterfly	non-native	uncommon
Order ODONATA - dragonflies, damselflies			
LIBELLULIDAE (Skimmer Dragonfly Family)			
<i>Pantala flavescens</i> Fabricius	globe skimmer	indigenous	uncommon



Figure 1. Project Area – Kihei, Maui.



Figure 2. Project Area along South Kihei Road.



Figure 3. Project area on the northern side showing extensive graveled area. South Kihei Road is on the left. Open-air craft fair area in top center.



Figure 4. Southwest corner of the project area showing a graveled parking area behind the craft fair.



Figure 5. Extreme southwest corner of the project area showing trees and shrubs growing along the border.



Figure 6. Two native ground cover species ‘ākulikuli (*Sesuvium portulacastrum*) and kipukai (*Heliotropium curassavicum*) growing near the southwest corner of the project area.

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APPENDIX C

Archaeological Reports

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
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PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

May 23, 2005

Mr. Erik Fredericksen
Xamanek Researches
P.O. Box 880131
Pukalani, Hawai'i 96788

LOG NO: 2005.1001
DOC NO: 0505MK20

Dear Mr. Fredericksen:

SUBJECT: Historic Preservation Review - 6E-42 - Archaeological Assessment Survey Draft Environmental Assessment and Applications for Amendment of Conditional Zoning, change in Zoning, and Special Management Area Permit for the Proposed Stinson & R.C. Ching Families' Kihei Business Complex (Subject I.D.: CIZ 2001/0014, SM1 2001/0018, EA 2001/0008) Waiohuli Ahupua'a, Wailuku District, Island of Maui TMK (2) 3-9-007:037, 038, 039, 040, & 3-9-08:016

Thank you for the opportunity to review this report which our staff received on April 5, 2005 (Fredericksen 2005, *An Archaeological Assessment for a Portion of Land Located in Keokea Ahupua'a, Wailuku District, Island of Maui [TMK 3-9-07:37, 38, 39, and 40, and TMK 3-9-08:16]...Xamanek Researches ms*). We have previously provided comments on the above actions (Log 29783/Doc 0204CD51) and recommended an archaeological inventory survey to determine the likelihood of historic properties present in the project area.

The background section acceptably establishes the ahupua'a settlement pattern and predicts the likely site pattern in the project area. The historical information provided summarizes the history of the post-contact period land uses. The summary of previous archaeological work in the area provides a baseline for the current work. One comment on page 11, Kula Kai Fishponds, paragraph 1: the second line should read "northwest" not southwest.

The survey has adequately covered the project area documenting no historic properties. Subsurface testing (eleven backhoe trenches) were also negative for evidence of cultural deposits. The trenches all yielded evidence of extensive fill overlaying a sand deposit. The probable depositional sequence included recent historic efforts to fill in wetlands subject to periodic flooding. The project area is very close to (inland of) an unnamed fishpond in Keokea, and in addition to the wetland deposits, the area was likely an area of habitation. An extensive habitation deposit is located on the south side of a wetland area along Halama Street (SIHP 50-50-10-5003).

Erik Fredericksen
Page 2

We agree with the recommendation that monitoring is an appropriate mitigation against potential impacts to historic properties during any development on the subject parcel. We will anticipate receipt of a monitoring plan for review and acceptance.

We find this report to be acceptable. As always, if you disagree with our comments or have questions, please contact Dr. Melissa Kirkendall (Maui/Lana'i SHPD 243-5169) as soon as possible to resolve these concerns.

Aloha,



MELANIE A. CHINEN, Administrator
State Historic Preservation Division

MK: kf

c: Bert Ratte, DPWEM, County of Maui
Michael Foley, Director, Dept of Planning, 250 S. High Street, Wailuku, HI 96793
Maui Cultural Resources Commission, Dept. of Plng, 250 S. High St, Wailuku, HI 96793

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**An Archaeological Assessment for a portion of land
Located in Keokea *Ahupua`a*, Wailuku District,
Island of Maui
(TMK: 3-9-07: 37, 38, 39 and 40, and
TMK: 3-9-08: 16)**

Prepared On behalf of:

**Mr. Jim Stinson
WAISCO, Inc.
Wailuku, Maui**

Prepared by:

**Xamanek Researches, LLC
Pukalani, Maui
Erik Fredericksen**

31 March 2005

ABSTRACT

Xamanek Researches, LLC conducted an archaeological inventory/assessment survey on a c. 2-acre portion of land in Waiohuli *ahupua`a*, Wailuku District, Island of Maui ((TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16). This inventory/assessment survey was carried out near the end of 2004 on behalf of the Stinson Trust. The study area is located in a mixed residential and business community of Kihei, Maui. The archaeological survey was conducted on behalf of Mr. Jim Stinson, WAISCO, Inc., Wailuku, Maui. Fieldwork for this archaeological survey was carried out in December 2004 and January 2005.

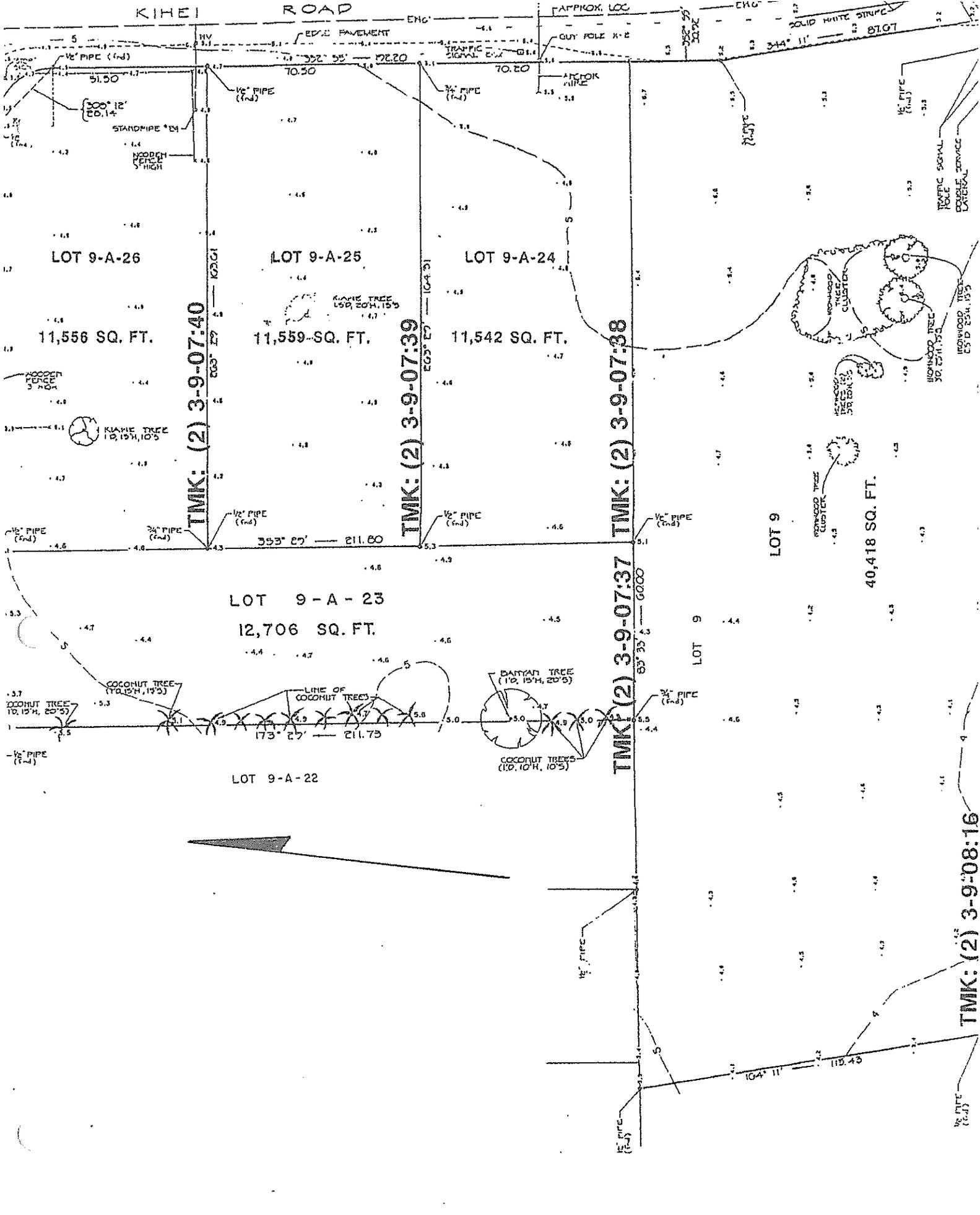
There was no evidence of significant material culture remains encountered during subsurface testing on the level project area. However, intact marine sand deposits were located in all 11 test instances on the study area. Test results indicate that the project area has been impacted by previous earth moving activities associated with the placement of fill. The fill was a maximum of 70 cm in depth in tested locations on the project area.

Given the presence of marine sand deposits on the 5 parcels, archaeological monitoring is the recommended mitigation when this study area is developed. This mitigation step is considered to be appropriate, because Native Hawaiian burials have been encountered in sand deposits in Kihei as well as in other locations of Maui.

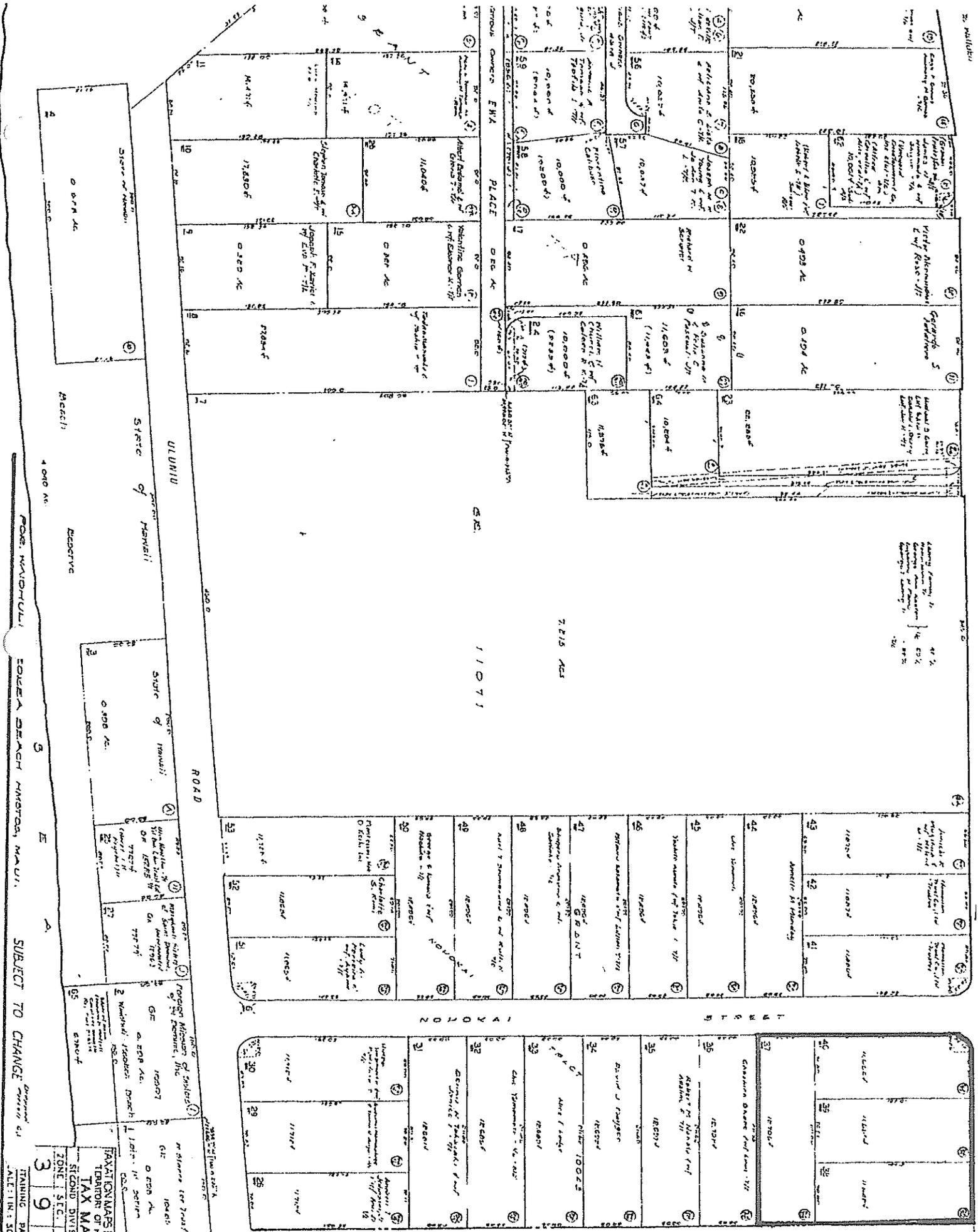
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KIHEI ROAD

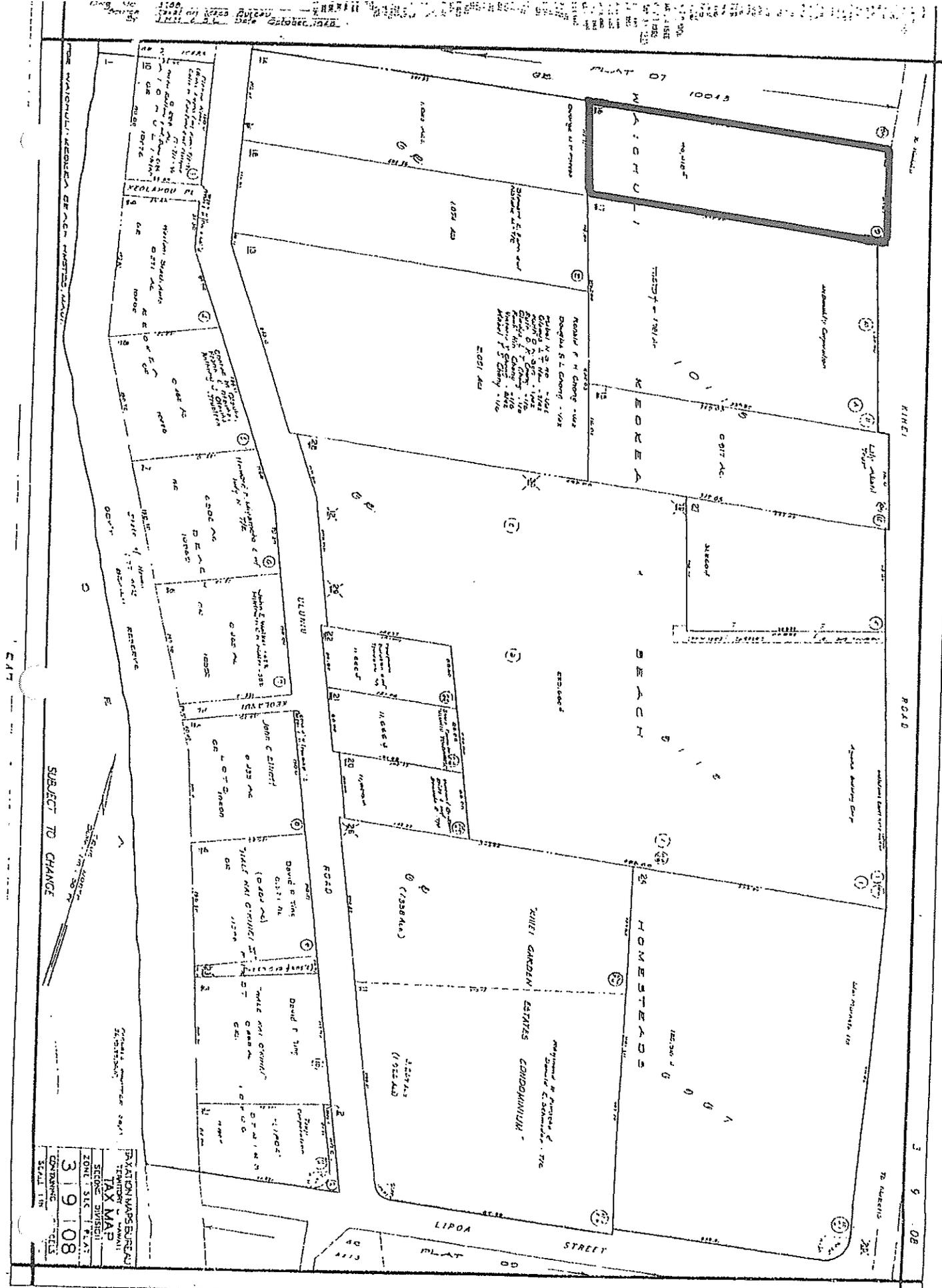


Map 1—Topographic map of the project area.

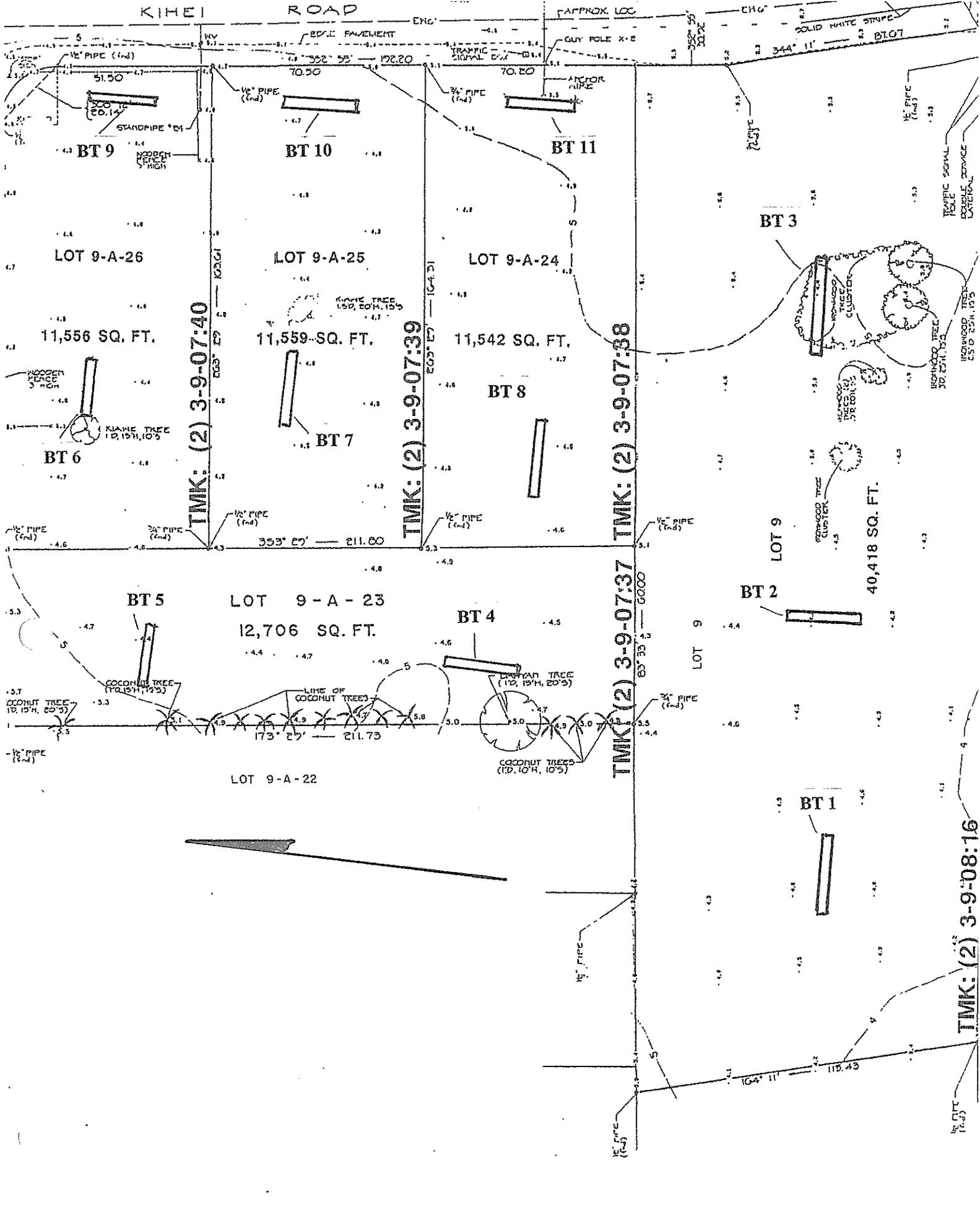


Map 2a—State Tax Map of TMK (2) 3-9-07: 37, 38, 39 and 40.

HAWAIIAN LANDS BUREAU
 TERRITORY OF HAWAII
 TAX MAP
 SECOND DIVISION
 ZONE 3
 SIC 9
 PLAT 07
 DRAWING PARCELS
 SCALE: 1 IN. = 30 FT.



Map 2b—State Tax Map of TMK (2) 3-9-08: 16.



Map 3: Topographic map of the project area with locations of BTs 1-11.

INTRODUCTION

Mr. Jim Stinson of Wailuku, Maui contacted Xamanek Researches¹ in late 2004 about an archaeological inventory/assessment survey project in Kihei, Maui. The project area was located *makai* of South Kihei Road and consisted of five contiguous parcels (TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16). Dr. Melissa Kirkendall of the State Historic Preservation Division (SHPD) had earlier recommended that Mr. Stinson carry out an inventory/assessment survey on his properties, because they contain sand deposits. Mr. Stinson requested that we conduct the survey on his behalf.

We were given the notice to proceed in the late fall of 2004 and fieldwork was carried out in late December of 2004 and in early 2005. The following report presents the results of this survey, which under the new SHPD guidelines is an archaeological assessment.

STUDY AREA

The project area consists of five separate parcels that are located Keokea *ahupua`a*, Wailuku District, Maui (TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16). The study area lies adjacent to and *makai* (west) of South Kihei Road (Maps, Photographs 1 and 2). Nohokai Street borders the northern portion of the study area, while private residences bound the western side and the McDonald's development lies to the south. The study area was vacant at the time of our assessment survey, and visibility was generally good. Grading activities associated with the construction of the surrounding residential area appears to have impacted the margins of the project area, while some fill from unknown sources appeared to have been imported at some time in the past. Portions of the project area had been partially cleared of vegetation sometime in the past, and various landscaping waste also were present. A few *kiawe* (*Prosopis pallida*) trees were scattered across the Stinson parcels, while a stand of ironwood (*Casuarina equisetifolia*) trees were located on the southern part of the study area. In

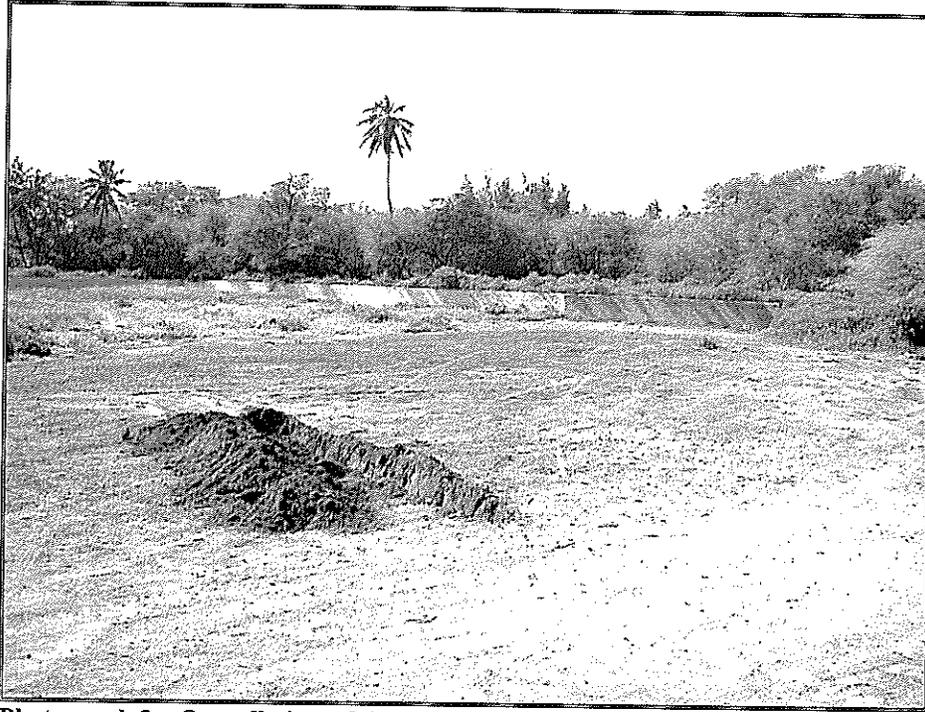
¹ Xamanek Researches became Xamanek Researches, LLC, a Hawaii-based Limited Liability Company in 2005.

addition, several stands of Pluchea indica shrubs were scattered around the perimeter of the study area, while pickle weed (Batis maritima) formed the dominant ground cover on portions of the property. The parcel lies about ¼ km inland from the coast.

This portion of Maui is typical of the Kihei near coastal region, with soil components primarily composed of aeolian sands, silty clay, and weathered parent material and shallow bedrock. Estimate elevations of the study parcel range from c. 4-6 ft AMSL. This semi-arid region receives an average annual rainfall of c. 10 to 15 inches. The area has also been identified as the “coastal beach zone” by previous researchers (Cox, 1976 and Cordy, 1977).



Photograph 1– Overall view of the project area to the southwest across South Kihei Road.



Photograph 2 – Overall view of the southwestern project area.

BACKGROUND RESEARCH

The Kula District was a relatively minor political territory under the jurisdiction of West Maui chiefs. It is an arid region with no perennial streams, located on the western slope of Haleakala Crater. The primary resources of the upland area of Kula district were dry forest products, and dryland agricultural products, e.g. sweet potatoes (Kolb, July 1997, p. 25). Within this larger traditional land division (*moku*) there are several long, narrow *ahupua`a* that stretch to the ocean shore. These are shown on Figure 1.

The *ahupua`a* of Keokea became part of the Hawaii Government Lands² during the Mahele of 1848. Perusal of the Land Commission Awards information reveals that no *kuleana* were awarded in the coastal area of this *ahupua`a*. A total of 52 claims are recorded, all of them being in the Kula district (Waihona `Aina data base, and the Index of Land Commission Awards). Of those 52 claims recorded, more than half (28) were

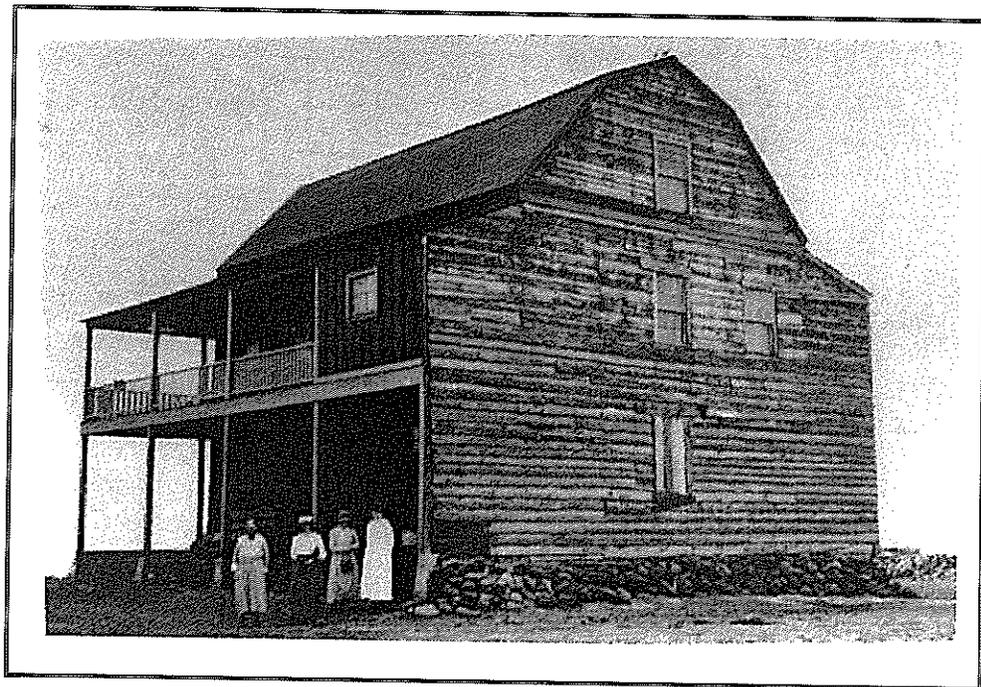
² The Hawaii Privy Council awards of 1848, in which Hawaiian lands owned and inherited by descendants of the Royal family, stated that the majority of lands in Kama`ole were “reserved for the government cattle range”.

not awarded. Those claims that were awarded were forouselots, and/or garden plots or *kula* lands. Eleven of the claimants lived in Waikapu, where they had primary claims, their claims in Kama'ole being subsidiary claims on small farm plots. These awarded plots are located above the 700-foot contour line, on both sides of the old government road that follows the general route of the *alanui apuni* (Figure 2) [Kolb et al., 1997, pp. 50-60]. The pattern of distribution of LCAs in Keokea is similar to that found in Waiohuli *ahupua`a* to the north and Kama'ole *ahupua`a* to the south.

Kula land is described by Handy and Handy (1972, pg. 510) as:

"...open country, or plain, as distinct from valley or stream bottom, and has long been used as a term to distinguish between dry, or "kula land" and "wet-taro land". This is an essential characteristic of Kula, the central plain of Maui which is practically devoid of streams. ...Kula was widely famous for its sweet-potato plantations. `Uala was the staple of life here."

By the 1840s, the increased number of whaling ships anchoring off Maui shores created a substantial market for produce such as sweet and Irish potatoes, which grew well in the Kula region. Irish potatoes were coveted more highly, however, and became of greater importance in the produce trade. They were transported from the Kula fields to the shore, where they were often sold directly to ships that called at Kalepolepo. From there they were shipped to Lahaina, where the bulk of the whaling fleet moored.



Photograph 3 – Halstead's "Koa House" in 1920. It stood until 1946, when it was purposely burned because of its unsafe condition (Bartholomew and Bailey, p. 43).

After the California Gold Rush began in 1848, a potato boom commenced on Maui in the fall of 1849. Captain John Halstead established a trading post³ in 1849 in the village of Kalepolepo, in order to take advantage of this commercial activity. He built a large Pennsylvania Dutch-style, 3-story residence next to the south wall of Kalepolepo Fishpond. His trading station was located on the first floor of this structure. It was known locally as the *Koa House* (Photo 1). Halstead's large prominent house stood as a landmark for nearly one hundred years⁴—and was visited by Kamehamehas III, IV and V between 1850 and 1870.

Kuykendall (1938, p. 313) refers to an article in the Polynesian in November of 1849:

"The call for [potatoes] is loud and pressing, as some vessels bound for California have taken as many as 1,000 barrels each. The price is high, and the probability is that the market cannot be supplied this autumn. Kula, however, is full of people...preparing the ground for planting, so that if the demand from California shall be urgent next spring as it is now the people will reap a rich harvest."

The coastal portion of Kama'ole *ahupua'a* appears to have been relatively unaffected by the upland "potato boom", which lasted only a few years. For the most part, the coastal area was fairly sparsely occupied by people who primarily concentrated on the exploitation of marine resources.

Despite the relatively few souls in the overall Kihei, the trading village of Kalepolepo represented a concentration of people, and it was felt that they were in need of spiritual guidance. To this effect, construction of a small stone church was begun in 1843 at Kalepolepo near the trading post, under the direction of David Malo.

This gentleman was the son of a soldier in the army of Kamehameha I, and was born in 1793 on the Big Island. He later moved to Lahaina in the 1820s, where he came under the influence of Reverend William Richards and was converted to Christianity. With the establishment of Lahainaluna high school in 1831, David Malo enthusiastically enrolled as one of its first students. In 1843 he was licensed to the Christian ministry, and assigned to a congregation in Kalepolepo. He began construction of Kilolani Church, which continued until 1852. It was completed shortly before the death of David Malo on October 21, 1853. Following his death, his Kilolani congregation dispersed, and never met again at Kalepolepo. A fire is said to have damaged the structure, and a flood in the 1880s, also added to the destruction of the little stone church. The ruins of this church are listed on the National Register of Historic Places (Site 50-50-09-1587). Religious services were once again conducted at the ruins of this church in 1976. It is locally known today as "Trinity-Church-By-The-Sea".

³ Captain Halstead arrived in Lahaina from New York in 1838, and married the chiefess Kauwikikilani Davis, granddaughter of Isaac Davis, Kamehameha I's advisor.

⁴ In 1946 it was abandoned and was leased by the Kihei Yacht Club, the members of which tried to burn it down because it was so unsafe. Several attempts failed, but eventually the Maui Fire Department was called in and succeeded in reducing it to ashes in August of 1946 (Kolb, 1997, p. 70).

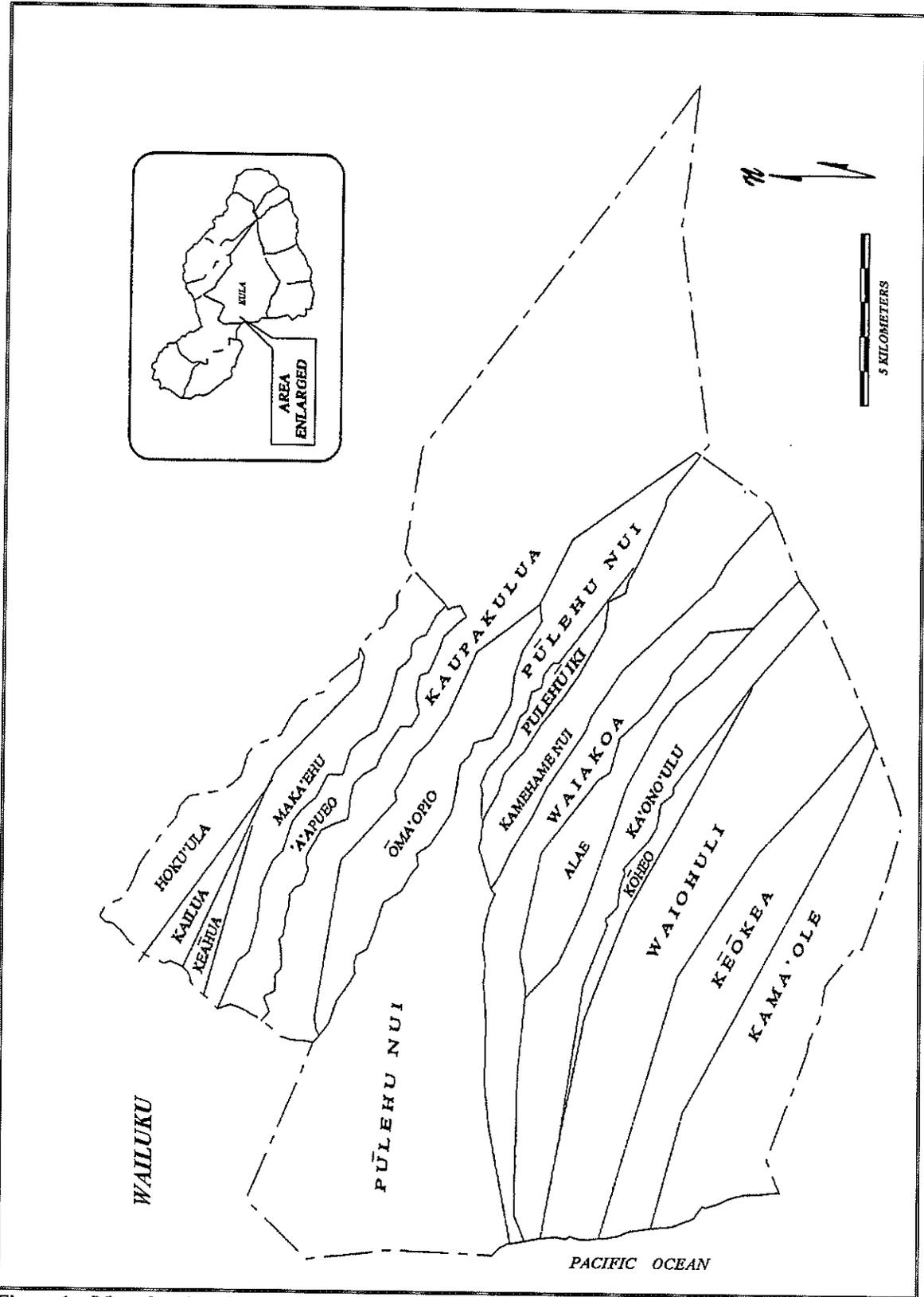


Figure 1 – Map showing the Kula lands (Kolb et al., 1997, p. 24).

Baldwin Family. It still maintains several thousand cattle on its 32,000 acres. Ka'ono'ula Ranch lands were originally part of an LCA to H. Hewahewa (LCA 8452 made up of 5715 acres), and LCAs 8452: 19 and 20 to A. Keohokaole. In the 1860s, ranch lands were obtained by a young Chinese immigrant, Young Hee, who was forced to return to China in the 1890s to settle family problems. At that time, the lands were acquired by William H. Cornwell, and they became the Cornwell Ranch. Harold W. Rice purchased the property in 1916, and Ka'ono'ula Ranch is currently operated by his grandson, Henry Rice, and consists of nearly 9000 acres in its entirety.

Another smaller ranch is located in the general vicinity of the project area—Kama'ole Ranch. An article in *The Maui News* (December 19, 1908) states that Antone F. Tavares of Makawao “purchased S. Ahmi's Kamaole Ranch property for \$8500.00. The ranch, located in droughty Kula district was a fine piece of property.” It goes on to say the Mr. Ahmi refused a former offer for \$9500.00 when he was asking \$15000.00 for it.⁵

The *Maui News* (March 7, 1928) noted:

“Senator A.F. Tavares has sold Kamaole Ranch to Haleakala Ranch for approximately \$110,000. For himself he retains the title to the cottage on the place and about 5.95 acres surrounding it... At present there are about 500 head of cattle running over the ranch and the purchasers have an option on this live stock at \$40 per head. Kamaole ranch has an area of approximately 1500 acres. It adjoins the Ulupalakua ranch which is owned by Frank F. Baldwin. Alexander and Baldwin, Ltd., is agent for Haleakala ranch and the purchase of Kamaole brings together two properties which occupy many thousands of acres of cattle land on the slopes of Haleakala. Kamaole is to be continued by the purchasers as a cattle ranch.”

During the early 20th century, there was little to attract people to South Maui, except good fishing and fine beaches. Only about 350 people made Kihei their home at this time. Finally, in 1932, the government offered 11 beach lots for sale—the Waiohuli-Keokea Homesteads—with the hope of spurring development of a desirable residential district. These homestead lands lie to the northwest of the present study area.

An article in *The Maui News* dated November 11, 1931 reports that the coveted Kihei Beach lands “will be opened for Public Sale in the near future for home building”. Those in favor of the sale, say that it would promote development of the Kihei area into a better-class residential district. The chief of the opposition for the sale was Senator Harold W. Rice, who maintained that the area should be preserved as government property and should be turned over to homesteaders.

⁵ Mr. Ahmi was also known as Sun Mei, a notable personage in Kula in the early part of the century. In 1901 he was arrested for stealing cattle, and he sued for false imprisonment a few weeks later. In 1903 he was indicted in a police bribery case, but was later acquitted. He was also involved in civil suits, and tax cases, as well as being outspoken in political matters during 1904 and 1905. By 1906 his property was listed in a sheriff's sale, and sold in 1908 (Bartholomew, 1985).

As it turned out there was little interest in Kihei lands, and only 6 of the parcels were sold. By 1950, farmland could be gotten for about \$225 per acre and residential lots sold for 5 to 10 cents a square foot (Bartholomew and Bailey, p. 142). Kihei was not thought of as a desirable living area, for the most part, due to the general dry, dusty and hot conditions.

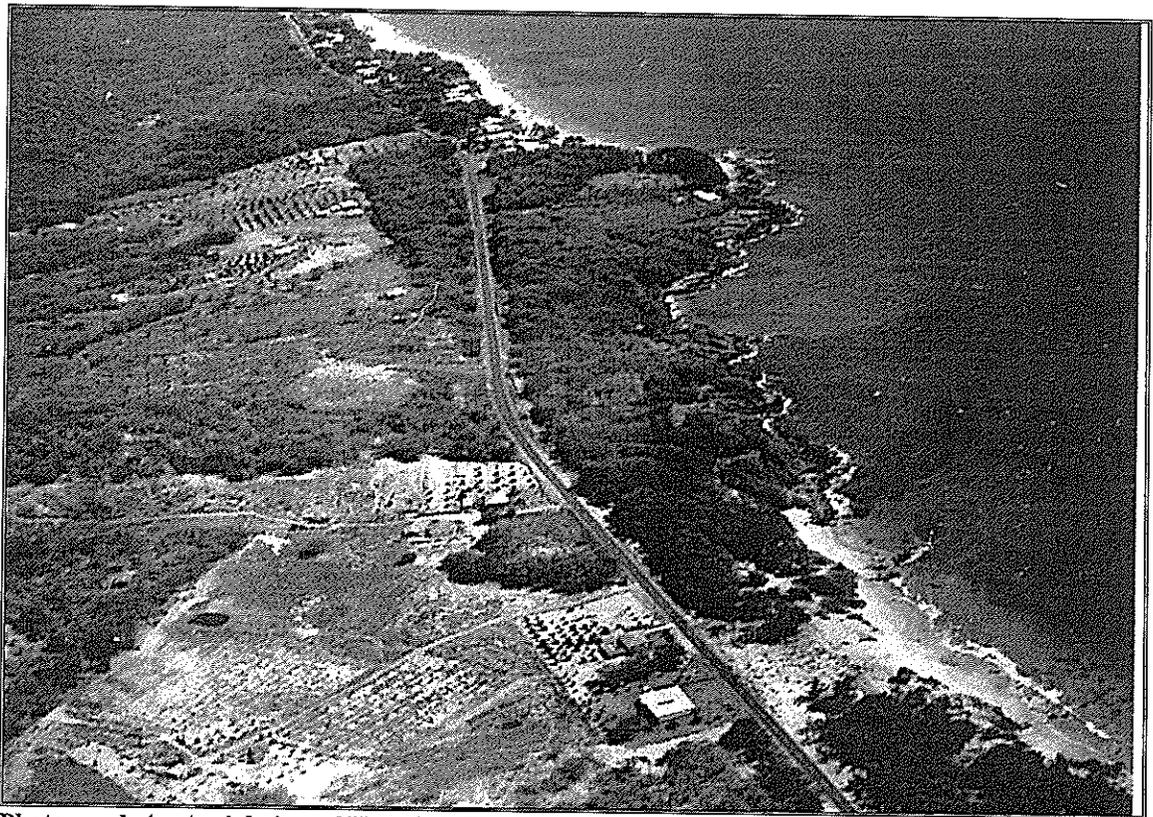
A few years after the partition of these homestead lots, World War II erupted, and this part of South Maui was soon dominated by the military. An article on the front page of The Maui News dated June 9, 1945, gave information about the placing off-limits of land located in Kihei-Makena. It reads:

“Beginning at the north at the southern boundary of the property of William Harvey, tax map key 390257, which is approximately 3.3 miles south of the pier located across Makena road from the Kihei Store and ending at the south of the southern end of the Naval Air Station, Puunene, recreation beach five miles south of the pier across from the Kihei Store, and extending from the western boundary of Makena road to an imaginary extension of the shore line of Maalaea bay extending at all point 2000 yards seaward of the actual shoreline thereof.

The northern and southern boundaries of the area described herein have been identified by placing of out-of-bounds signs thereon.”

The prohibition applied to military as well as civilian personnel, with the exception of those attached to the Naval Combat Demolition Training and Experimental Base, the Kama'ole Amphibious Training Base, and the Pu'unene Naval Air Station. They were allowed to use the facilities of the Naval Air Station recreation beach situated within the area. Kalama Park was accessible, but persons had to remain within the park boundaries, and could not swim, wade, or fish in the waters adjacent to the park under any circumstances. Civilians living within the restricted area were allowed access to their homes, however.

Only in fairly recent times—from the 1960s on—has Kihei taken on importance as a place of residence and commerce. At present it is one of Maui's busiest tourist areas, with condominium/hotel development, and associated commercial activities. At the same time, with the increase of population, it has become a major residential area.



Photograph 4 – Aerial view of Kama'ole Beach in Kihei during the 1940s, showing military installations (probably the Kama'ole Amphibious Training Base). [Bartholomew and Bailey, p. 142]

Previous Archaeological Work in the Kihei Area

Prior to the relatively recent commercial development in Kihei, the only archaeological work was that carried out by Winslow Walker in his cataloging of *heiau* on Maui (1931). Five *heiau* are listed as being within Kama'ole *ahupua`a*. They are Wailuku (Site 205); Kolea (Site 206); Keahialoa (Site 208); and Papakea (Site 209). The fifth is a small, unnamed structure (Site 207).

- Site 205 is located at Kawililipoa on a hill above A.F. Tavares home and not more than 100 feet from the old Kalepolepo road. It is a large platform without walls, measuring 105 x 94 feet, 5 feet high, constructed of large blocks of *a`a*. Coral was seen, but not pebbles. There is a central high platform 67 x 80 feet, raised 18 inches above the main pavement. It is thought to be a sacrificial *heiau* (Ibid., p. 271).

- Site 206 is located at Kawililipoa, northwest of the county road and below it about ½ mile. It is a large L-shaped *heiau* 88 feet x 95 feet—walled on the north and east sides and double-terraced as well. Said to be for sacrifice (Ibid., p. 272).
- Site 207—an unnamed *heiau*, located near Wailuku below the main road at Kawililipoa. It is a small platform 22 x 30 feet—perhaps a *ko`a* (Ibid., p. 273)
- Site 208 is located on the hill 50 yards back of the Kula Sanatorium. It is a small rough platform 22 by 25 feet. This structure may be a rain *ko`a* (Ibid., p. 274).
- Site 209 is located ¼ mile below Kula Sanitarium in an open flat. It is an open platform of a`a construction, measuring 45 x 88 feet. The front is double-terraced to a height of 4 feet (Ibid., 275).

Kula Kai Fishponds

Kalepolepo Fishpond (Ko`ie`ie Fishpond and Ka`ono`ulu Kai Fishpond—Site 1288 lies about ½ km to the southwest of the project area, in Ka`ono`ulu *ahupua`a*. The following information is adapted from the National Register of Historic Places Registration Form, prepared by Theresa Donham in April 1996. This fishpond is situated on a fringing coral reef, with the main portion of the wall following along the outer perimeter of the reef. This is a *loko kuapa* (walled pond). The presence of fringing reefs along the shoreline of Kihei was idea for the construction of such ponds. There are 3 other ponds extending along the coast. South of Kalepolepo is Waiohuli Kai Pond (Site 1704) and to the south of that is Keokea Kai Pond (Site 1738). Another unnamed fishpond is located in Keokea *ahupua`a*, closer to the border with Kama`ole. The presence of these fishponds would have significantly increased the economic potential for the coastal Kula area. Climate is not favorable for agriculture, but quantities of the fish species *`ama`ama* (mullet) and *awa* (milkfish) could have been raised. While the original date of construction is not known, traditional *mo`olelo* suggest continued use beginning in the middle of the 1500s and continuing through the late 19th century.⁶

Other Archaeological Studies

Ross Cordy (1977) identified the occurrence of three ecological “zones” in the Kihei area in a reconnaissance survey report prepared for the U.S. Army Corps of Engineers. These are the coastal zone of habitation, the intermediate, or barren zone, and the inland habitation zone. The “coastal zone” was one of habitation and marine resource exploitation (i.e., the fishponds). The “intermediate, or barren zone” was generally considered to be an inhospitable area, in which little human activity was to be expected, with the exception of intermittent and/or transitory habitation along *makai-mauka* trails inland. The “inland habitation zone” was an area above c. 1500 feet of elevation, where conditions were ideal for growing sweet potatoes and other subsistence crops.

⁶ The above temporal range corresponds to radiocarbon dates obtained in Kihei. Archaeological monitoring at Kalama Park in Kama`ole *ahupua`a*, yielded several dates—falling in the range from AD 1280 to c. 1800 (Burgett, McGerty, Dunn and Spear, 1996, pp. 68-70). Additional dates were recovered from two temporary habitation rock shelters in Waiohuli *ahupua`a*, located about c. 0.5 km. inland. Site 3139 yielded a calendric range of AD 1560-1800 (Fredericksen et al., 1993). Dates from 2 fire hearths at Site 3529 indicate a period of use between AD 1400 to 1700 (Fredericksen et al., 1995, 1996). These archaeological dates are consistent with the available oral history information pertaining to an intensification of activities in the coastal area, beginning in the late 15th and early 16th centuries.

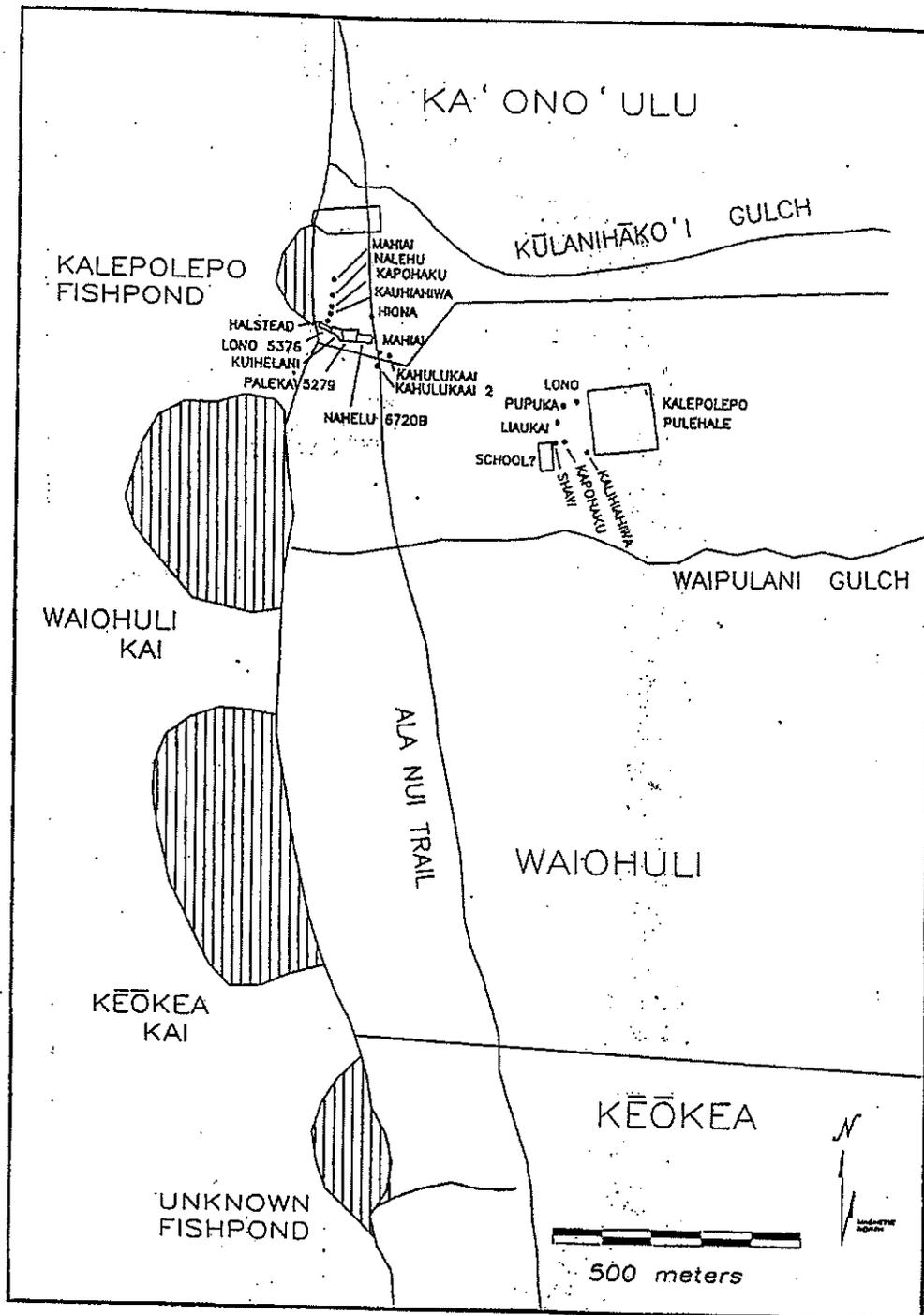


Figure 3 - Map showing distribution of fishponds to the west of the project area (Donham, 1996).

The most intensive project in the “coastal zone” was done during the monitoring and subsequent data recovery work for the Kihei Public Library, near the northern boundary of Kalama Park in Kama`ole *ahupua`a*. Five sites were identified—Sites 3998 and 4499 were interpreted as habitation sites; Site 3942 was interpreted as a precontact habitation site and shrine (*ko`a*); Site 3944 was interpreted as a precontact habitation site

with a probable burial; and Site 4500 consisted of a scatter of human remains (Burgett et al., p. i). Additionally, several radiocarbon dates indicated that habitation in this zone was as early as the 13th century, and probably extended into historic times.

Xamanek Researches conducted an inventory survey of 2 parcels of coastal land on Waiohuli and Halama Streets, in late 2000 (Fredericksen and Fredericksen, January 20, 2001). A probable precontact habitation site remnant was located on the *makai* side of the study area (Site 5003), and a human humerus was located in a previously excavated sewer tie-in line to the property. Groundwater on much of the study area was within a meter of the surface.

Donham's findings in Waiohuli *ahupua`a*, of what were interpreted as agricultural terraces c. 0.5 km. from the shoreline, prompted her to suggest that another zone—the coastal perimeter zone—was also present (*mauka* of the coastal zone). Here, seasonal intermittent agricultural activity took place during periods of rainfall (Donham, 1989, 1990).

With the rapid development that has taken place in the Kihei area in the last two decades, came a number of archaeological studies in the 1980s and 1990s (Donham, 1989, 1990; Kennedy, 1986; plus many more). The majority of these studies have been situated *mauka* of South Kihei Road and several did not locate significant historical findings (in the so-called “barren zone”). However, several instances of habitation sites associated with trails and trail markers have been recorded (Fredericksen et al., 1993; June 1994; July 1994; November 1994; April 1995; May 2000). Three of these sites (Sites 3193, 3541, and 3529) consist of rock overhang shelters, with hearths containing shellfish midden and fish bone. In these temporary habitation shelters, volcanic glass, fishhook blanks, and coral files suggest that fishhook manufacture was an activity engaged in while making the trip to the inland habitation zone. These all date from the 17th century—the period of expanded population and the utilization of more marginal areas of South Maui.

Hammatt and Shideler conducted an inventory survey over a 54-acre area between South Kihei Road and Pi`ilani Highway. The original study was in 1989, and a follow-up one in 1992 identified a number of sites *makai* (south) of the present project area. The most significant were Sites 2633 and 2637, small fishing shrines (*ko`a*). The other site, Site 2636, was interpreted to be a traditional Hawaiian site that was reworked during construction of a foundation for a 3-meter diameter water tank. The research potential was considered to be low, and no testing was undertaken (1992, p. 31).

As development of the new Kihei Elementary School progressed, Xamanek Researches was contracted to further investigate an overhang shelter habitation site (Site 2636) that is located c. 3 km *mauka* (southeast) of the present study area. A subsurface cultural deposit at this site returned a radiometric date of AD 1295 to 1495.⁷ This site, located in the Kama`ole drainage system, appeared to be associated with an inland trail

⁷ This date is contemporary with a date from Site 3942 in the “coastal zone”, obtained from subsurface materials (Burgett et al.).

that followed that geological feature. The 2 small fishing shrines (*ko`a*) [Sites 2637 and 2633] were also probably associated with this trail, and have been preserved (Fredericksen et al., November 1994).

Another open, temporary habitation site was documented during a recent data recovery program (Fredericksen et al., May 2000).⁸ Here, a rough rock enclosure, situated along an inland trail in Kama`ole *ahupua`a*, was also used as an activity site for manufacture of coral abraders and files. This site lies c. 5 km *mauka* (southeast) of the project area.

A large boulder with a human figure on it (Site 3746), found at about 100 feet elevation, *mauka* of Pi`ilani Highway in Ka`ono`ulu *ahupua`a*, is also interpreted as a trail marker (Fredericksen et al., July 1994).

The “inland zone” is principally defined by archaeological work done for the Department of Hawaiian Home Lands (DHHL) over the last 2 decades. The Waiohuli and Keokea Hawaiian Homes Subdivision has been studied by the Bishop Museum (Riford, 1987), PHRI (Brown and Haun, 1989); and the State Historic Preservation Division (Kolb, Conte and Cordy, 1997).

The traditional Kula region of Maui is divided into 3 or possibly 4 occupation zones, based on archaeological work done in the last 30 years. These are the “coastal zone”, the “barren or intermediate zone” and the “inland zone” (Cordy, 1977). In addition, later findings by Donham (1989, 1990) suggest that a “coastal perimeter zone” may also be identifiable, as an area of intermittent, seasonal agriculture.

Settlement Patterns and Predicted Findings

The study area lies in the “coastal zone”—an area of habitation, using the model developed by Cordy (1977). The predicted findings, based on background research, would be evidence of habitation and/or possibly associated human burials. There were no *kuleana* claims on the near coastal zone study area in Keokea *ahupua`a*, suggesting that possible habitation sites, if present, might have been temporary in these arid land divisions.

The “intermediate zone” has proven to be less barren than originally thought, as more studies have identified sites used for intermittent habitation scattered along inland trail routes. The “inland zone” has also been more intensively studied, principally with the research done for Department of Hawaiian Home Lands, in Waiohuli and Keokea Subdivisions (Brown and Haun, 1989; Riford, 1987; Kolb, Conte and Cordy, 1997). All of the *kuleana* claims and awards in Waiohuli, Keokea and Kama`ole are in this habitation zone, as well.

⁸ Site 4727 is located c. 1 km. *mauka* (northeast) of Site 2636.

The overall pattern of this part of the island is fairly well understood, with relatively intensive activity on the coast, and inland. These two areas are connected by *makai-mauka* trails, along which economic goods were transported for exchange. The existence of such a trail in Kama'ole has been suggested by several archaeological studies.

Post-contact land usage consisted primarily of pasture for cattle grazing on lands *mauka* of the coastal zone. During World War II, the near coastal area was impacted by military activity, which no doubt altered the topography to some degree. Refer to Photo 2 for an aerial photograph of Kama'ole Beach, which lies c. 3/4 km to the southwest of the study area. This photograph was taken during WWII, and shows the extent of clearing and construction carried out by the military in this portion of Kihei.

While remains unknown if military activities impacted the project area, more recent earthmoving activities associated with the development of the surrounding residential community clearly have altered the sloping parcel. However, it can still be expected to find subsurface evidence of precontact habitation, with possible associated human burials present in the project area.

TABLE 1
Selected Archaeological Projects in the Kihei Area

Authors	Nature of work	Findings
Burgett, McGerty Dunn and Spear June 1996	TMK: 3-9-12: 13. Monitoring at Kihei Public Library, Kama'ole <i>ahupua'a</i> .	Five sites w/20 features—2 habitation sites, 1 habitation and shrine (<i>ko'a</i>), 1 habitation and probable burial, and 1 scatter of human remains. Date ranges AD 1280 to c. 1800.
Donham, 1989	Inventory survey of Pi'ilani Residential Community, Phase I—TMK 2-2-02: por. 42. Waiohuli <i>ahupua'a</i>	5 Surface sites, including agricultural terrace (Site 2475). Suggests "coastal perimeter zone" be added to Cordy's model.
1990	Phase II-Keokea <i>ahupua'a</i>	Similar, but fewer features
Fredericksen, W. & D., 1990	TMK: 3-9-20: 7. Inventory survey.	No significant findings.
July 1990a	Monitoring for Azeka Place.	Wetlands-no significant archaeological findings.
July 1990b	Monitoring for Longs Drugs.	Findings as above.
1991	TMK: 3-9-17: 26. Inventory survey.	No significant findings.
1992	TMK: 3-9-04: 79. Additional inventory work.	Scattered surface human remains in large sand dune area.

Table 1 cont.

Fredericksen, D., E., W. September 1993	TMK: 2-2-02: 21. Inventory survey and data recovery.	Rock shelter (Site 3193) with hearths and volcanic glass debitage, shellfish midden. Dated AD 1560-1800 (270 +/- 120 RCYBP).
August 1994	TMK: 3-9-30: 21. Inventory survey.	No significant findings.
Fredericksen, E., D., W. June 1994	TMK: 3-9-18: 1. Inventory survey.	11 sites including rock shelter (Site 3541) dated AD 1520 to c. 1800 (220 +/- 60 RCYBP).
July 1994	TMK: 3-9-01: 16 and 2-22-02: por. 15. Inventory survey.	21 surface sites, including walls, military cairns, modified rock piles, and 1 petroglyph (Site 3746).
February 1994	TMK: 3-9-02: 91-94, 133-135. Inventory survey.	Wetlands—no significant archaeological findings.
November 1994	TMK: 3-9-18: 17 and 3-9-20: 27. Subsurface testing Site 2636	Open area site, indigenous artifacts, and hearth—radiocarbon date: AD 1295 to 1495 (530 +/- 80 BP).
Fredericksen, E. & D. April 1995	TMK: 2-2-02: por 66, 67; 3-9-02: 109. Inventory survey.	Wetlands near South Kihei Road. Rock overhang shelter (Site 3529). Volcanic glass debitage, indigenous artifacts, shellfish midden.
Fredericksen, E. & D. September 1996	Data recovery on Site 3529.	Additional indigenous artifacts. 3 radiocarbon dates: AD 1470-c.1800 (260 +/- 70 BP; 240 +/- 60 BP; 230 +/- 60 BP).
Fredericksen, D. & E. 2000	TMK: 2-2-02: por. 69. Data recovery on Site 4727	Rock enclosure, temporary habitation, and activity area of coral tool manufacture.
2001	TMK: 3-9-10: 75 and 78	Habitation site remnant (Site 5003) with possible associated human burial.
2002	TMK: 3-9-20: 34	Coastal habitation site remnant (Site 5170). Radiocarbon date of 220 +/- 50 BP.
Hammatt and Shideler 1989 and 1992	Inventory survey, Kama'ole <i>ahupua'a</i>	Historic house platform, 2 <i>ko'a</i> (Sites 2633 and 2637).
Kennedy 1986	Archaeological reconnaissance of Silversword golf course.	No significant findings in 125-acre area.
Neller, Earl 1982	TMK: 3-9-12: 3. Reconnaissance survey of Kalama Park	Investigated finds of human remains.
Pantaleo et al., 1991	Inventory Survey of Kihei school lots. Kama'ole lands.	Historic sites, food midden scatter.
Rotunno-Hazuka and Pantaleo 1991	TMK: 3-9-18: 1—Diamond Resort parcel.	No significant findings.

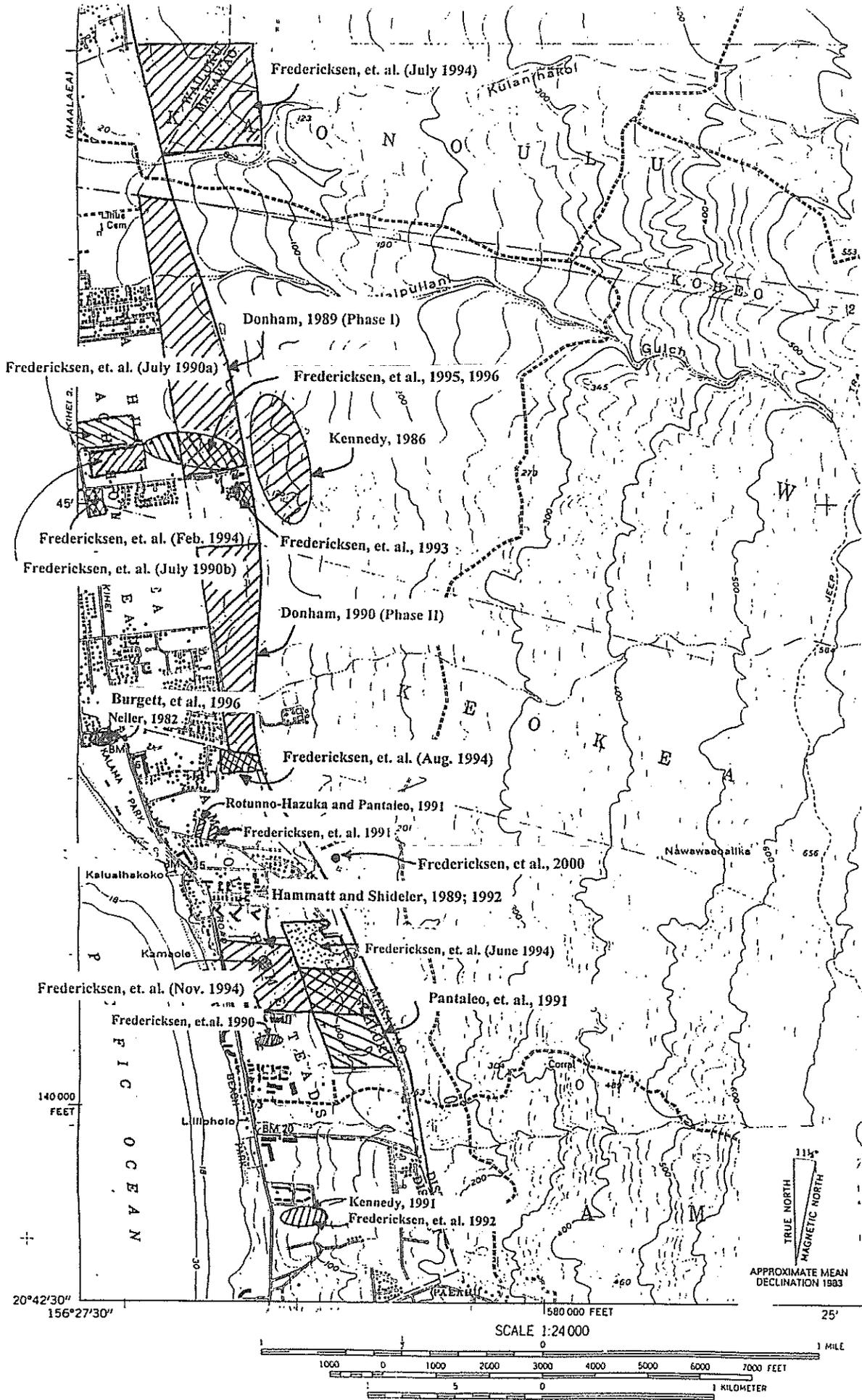


Figure 4 – Map showing locations of archaeological studies in the general vicinity of the present assessment survey.

ARCHAEOLOGICAL FIELD METHODS

Fieldwork was conducted in two phases. An initial inspection of the subject parcel was first carried out. This preliminary work was undertaken in order to obtain a general understanding of the project area. This inspection revealed that portions of the parcel have been actively used as a dumping area for landscaping debris. In addition, some previous grubbing appeared to have taken place. The surface pedestrian inspection utilized sweeps spaced c. 5 meters apart that were roughly oriented N-S.

Inventory level fieldwork was subsequently undertaken during late December of 2004, with some follow up work in early 2005. Archaeological project members consisted of Hugh Coflin and Andrea Livezey. Erik Fredericksen was the project director, and conducted the walk-over. Walter Fredericksen was the senior project advisor.

The evaluation phase of this inventory survey included 11 backhoe trenches. The trenches were typically 5-6 meters in length by 80 cm wide by up to 140 cm deep. Backdirt all soil was spot checked through 1/8th inch mesh hardware cloth. Standard laboratory procedures were followed and no material culture remains were transported off island.

Standard recordation methods were followed in the field and all mapping was done with metric survey tapes and hand held compasses. Photographs were taken in a digital format.

ARCHAEOLOGICAL FINDINGS

As previously noted, 11 backhoe trenches were used to sample the subject parcel. Subsurface results are discussed below. Refer to Table 2 for backhoe trench test results for this project.

Backhoe Trenches 1-11 (see Appendix B)

As previously mentioned, a total of eleven backhoe trenches were utilized to assess subsurface conditions on the project area. In general, common stratigraphy was encountered in all trenches. Layer I was composed of sandy fill and/or sandy fill with gravel. Layer II was made up of previously disturbed sand with clay inclusions. Layer III consisted of silty clay fill that was saturated. Modern materials were noted in this compact fill in at least four instances (i.e. Backhoe Trenches 2, 5, 7 and 10). The groundwater table was encountered during our testing between 60 and 80 cmbs in all 11 trenches. Intact marine sand deposits (Layer IV) were encountered at or near the groundwater table. Each trench is briefly discussed below.

Backhoe Trenches 1-3 (Figures 5-7, Photographs 5-7)

These three trenches were excavated on the TMK: 3-9-08: 16. These trenches were a maximum of 140 cm in depth. A total of four common strata were encountered before excavation was halted in the groundwater table.

Layer I was up to 40 cm thick and consisted of grayish brown (10 YR 5/2) fine-grained silty sand. Scattered modern materials were present in this loose soil, which is interpreted as fill.

Layer II was up to 25 cm thick and was composed of brown (10 YR 4/4) sand with clay and/or silty clay inclusions. This material is most likely fill.

Layer III was a maximum of 15 cm thick and was made up of brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay with moderate amounts of organic materials. This sticky stratum was very moist, and modern materials were noted in BT 2.

Layer IV (c. 60-140+ cmbs) contained waterworn shellfish remains and is interpreted as marine sand. This loose stratum was essentially saturated. The water table was encountered between 75 and 85 cmbs.

Backhoe Trenches 4 and 5 (Figures 8 and 9, Photographs 8 and 9)

These two trenches were used to sample TMK: 3-9-07: 37. These trenches were a maximum of 140 cm in depth. The four common strata present in BTs 1-3 were located before excavation was halted in the groundwater table in these trenches.

Layer I (0-15 cmbs) consisted of grayish brown (10 YR 5/2) fine-grained silty sand. Scattered modern materials were present in this loose soil, which is interpreted as imported fill.

Layer II was up to 20 cm thick and was made up of brown (10 YR 4/4) sand with clay and/or silty clay inclusions. It appears likely that this material is most likely fill.

Layer III was a maximum of 30 cm thick and was composed of brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay with moderate amounts of organic materials. This sticky stratum was very moist, and modern materials were noted in BT 5.

Layer IV (c. 60-120+ cmbs) contained waterworn shellfish remains and is interpreted as an intact deposit of marine sand. This loose stratum was essentially saturated. The water table was encountered between 60 and 75 cmbs.

Backhoe Trenches 6 and 9 (Figures 10 and 13, Photographs 10 and 13)

These two trenches were used to sample TMK: 3-9-07: 40. These trenches were a maximum of 140 cm in depth. The four common strata present in the previously discussed trenches were located before excavation was halted in the groundwater table.

Layer I (0-10 cmbs) consisted of grayish brown (10 YR 5/2) fine-grained silty sand. Scattered modern materials were again present in this loose soil, which is imported fill.

Layer II was up to 30 cm thick and was composed of brown (10 YR 4/4) sand with clay and/or silty clay inclusions. While there were no material remains noted in this loose layer, it appears probable that it is fill.

Layer III was a maximum of 20 cm thick and was made up of brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay with moderate amounts of organic materials. This sticky stratum was very moist.

Layer IV (c. 50-140+ cmbs) contained waterworn shellfish remains and is interpreted as an intact deposit of marine sand. This loose stratum was essentially saturated. The water table was encountered between 65 and 75 cmbs.

Backhoe Trenches 7 and 10 (Figures 11 and 14, Photographs 11 and 14)

These two backhoe trenches were utilized to sample TMK: 3-9-07: 39. Both trenches were a maximum of 120 cm in depth. The four common strata present in the previously discussed trenches were also located before excavation was halted in the water table.

Layer I (0-10 cmbs) consisted of grayish brown (10 YR 5/2) fine-grained silty sand. Scattered modern materials were again present in this loose soil, which is interpreted as imported fill.

Layer II was up to 30 cm thick and was made up of brown (10 YR 4/4) sand with clay and/or silty clay inclusions. While there were no material remains noted in this loose layer in these trenches, it appears probable that it is fill.

Layer III was a maximum of 15 cm thick and was composed of brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay with moderate amounts of organic materials. This sticky stratum was very moist, and modern materials were noted in BT 10.

Layer IV (c. 45-140+ cmbs) contained waterworn shellfish remains and is interpreted as an intact deposit of marine sand. This loose stratum was essentially saturated by the water table, which was encountered between 70 and 80 cmbs.

Backhoe Trenches 8 and 11 (Figures 12 and 15, Photographs 12 and 15)

These two backhoe trenches were utilized to sample TMK: 3-9-07: 38. Both trenches were a maximum of 130 cm in depth. The four common strata present in the other trenches were also encountered before excavation was halted in the water table.

Layer I (0-10 cmbs) was composed of grayish brown (10 YR 5/2) fine-grained silty sand. Scattered modern materials were noted in this loose soil, which is interpreted as imported fill.

Layer II was up to 30 cm thick and was made up of brown (10 YR 4/4) sand with clay and/or silty clay inclusions. While there were no material remains noted in this loose layer in these trenches, it appears probable that it is fill.

Layer III was a maximum of 15 cm thick and consisted of brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay with moderate amounts of organic materials. This sticky stratum was very moist.

Layer IV (c. 45-140+ cmbs) contained waterworn shellfish remains and is interpreted as an intact deposit of marine sand. This loose stratum was essentially saturated by the groundwater table, which was encountered @ 75 cmbs.

TABLE 2
SUMMARY OF BACKHOE TEST RESULTS

BT	Length ⁹	Stratigraphy	cmbs ¹⁰	Remarks
1	6	Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand Layer II: brown (10 YR 4/4) sand w/ clay inclusions Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material. Layer IV: gray (10 YR 6/1) marine sand (water table [WT] @ 75 cmbs)	0-40 40-50 50-60 60-140+	Layer I: modern materials, fill Layer II: sterile Layer III: soil very moist Layer IV: saturated
2	5.5	Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand Layer II: brown (10 YR 4/4) sand w/ silt clay inclusions Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material. Layer IV: gray (10 YR 6/1) marine sand (WT @ 85 cmbs)	0-25 25-50 50-65 65-130+	L I: gravel, fill L II: sterile L III: modern materials noted LIV: saturated
3	6	Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand with imported gravel Layer II: brown (10 YR 4/4) sand w/ clay inclusions Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material. Layer IV: gray (10 YR 6/1) marine sand (WT @ 75 cmbs)	0-25 40-50 50-60 60-140+	L I: modern materials, fill L II: sterile L III: soil very moist L IV: saturated
4	5.5	Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand Layer II: brown (10 YR 4/4) sand w/ clay inclusions Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material. Layer IV: gray (10 YR 6/1) marine sand (WT @ 60 cmbs)	0-15 15-30 30-40 60-80+	L I: modern charcoal, fill L II: sterile L III: soil very moist L IV: saturated
5	5.5	Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand Layer II: brown (10 YR 4/4) sand w/ silty clay inclusions Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material (10 YR 2/2). Layer IV: gray (10 YR 6/1) marine sand (WT @ 75)	0-15 15-35 30-60 60-120+	L I: modern materials, fill L II: sterile L III: modern materials noted L IV: saturated
6	5.5	Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand with imported gravel Layer II: brown (10 YR 4/4) sand w/ clay inclusions Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material. Layer IV: gray (10 YR 6/1) marine sand (water table [WT] @ 65 cmbs)	0-10 10-25 25-50 50-140+	L I: modern materials, fill LII: sterile LIII: very moist, oily L IV: saturated

⁹ Lengths are in meters; all trenches were 80 cm in width.

¹⁰ cmbs = centimeters below surface

Table 2 cont.

7	6	<p>Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand</p> <p>Layer II: brown (10 YR 4/4) sand w/ clay inclusions</p> <p>Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material.</p> <p>Layer IV: gray (10 YR 6/1) marine sand (water table [WT] @ 70 cmbs)</p>	<p>0-10</p> <p>10-40</p> <p>40-65</p> <p>60-120+</p>	<p>Layer I: modern materials, fill</p> <p>Layer II: sterile</p> <p>L III: modern materials noted</p> <p>Layer IV: saturated</p>
8	5.5	<p>Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand</p> <p>Layer II: brown (10 YR 4/4) sand w/ clay inclusions</p> <p>Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material.</p> <p>Layer IV: gray (10 YR 6/1) marine sand (water table [WT] @ 75 cmbs)</p>	<p>0-10</p> <p>10-45</p> <p>45-65</p> <p>65-130+</p>	<p>Layer I: modern materials, fill</p> <p>Layer II: sterile</p> <p>Layer III: soil very moist</p> <p>Layer IV: saturated</p>
9	5	<p>Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand</p> <p>Layer II: brown (10 YR 4/4) sand w/ clay inclusions</p> <p>Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material.</p> <p>Layer IV: gray (10 YR 6/1) marine sand (water table [WT] @ 75 cmbs)</p>	<p>0-10</p> <p>10-30</p> <p>30-45</p> <p>45-130+</p>	<p>L I: modern materials, fill</p> <p>L II: sterile</p> <p>L III: soil very moist</p> <p>L IV: saturated</p>
10	5	<p>Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand</p> <p>Layer II: brown (10 YR 4/4) sand w/ clay inclusions</p> <p>Layer III: brown (10 YR 4/3) to dark brown (10 YR 3/3) silty clay w/organic material.</p> <p>Layer IV: gray (10 YR 6/1) marine sand (water table [WT] @ 80 cmbs)</p>	<p>0-10</p> <p>10-30</p> <p>30-45</p> <p>45-120+</p>	<p>L I: modern materials, fill</p> <p>L II: sterile</p> <p>L III: modern materials noted</p> <p>L IV: saturated</p>
11	5	<p>Layer I: grayish brown (10 YR 5/2), loose, fine-grained silty sand</p> <p>Layer II: brown (10 YR 4/4) sand w/ clay inclusions</p> <p>Layer III: brown (10 YR 4/3) to dark brown (10 YR 33/3) silty clay w/organic material.</p> <p>Layer IV: gray (10 YR 6/1) marine sand (water table [WT] @ 75 cmbs)</p>	<p>0-10</p> <p>10-30</p> <p>30-70</p> <p>70-125+</p>	<p>L I: modern materials, fill</p> <p>L II: sterile</p> <p>L III: soil very moist</p> <p>L IV: saturated</p>

Discussion of Subsurface Results

There was no evidence of an intact cultural layer found during subsurface investigation on any portion of the study area. It appears that essentially all of the project area has been covered by imported fill. The fill zone in sampled areas ranged from 45 to 70 cm in thickness. All excavated trenches revealed intact marine sand deposits that were near the groundwater table, which was as shallow as 65 cm below the existing surface of the study area.

SUMMARY AND CONCLUSIONS

As previously discussed, a total of 11 backhoe trenches were used to sample subsurface conditions on the project area. Test results indicate that the project area has been impacted by previous earth moving activities associated with the placement of fill. There was no evidence of an intact cultural layer found during subsurface investigation on any portion of the study area. It appears that essentially all of the project area has been covered by imported fill. The fill zone in sampled areas ranged from 45 to 70 cm in thickness. Intact marine sand deposits that were located near the groundwater table in all backhoe trenches. This stratum was no more than 70 cm below the existing surface.

Site Significance Evaluations

The following significance evaluations are based on the Rules Governing Procedures for Historic Preservation Review (DLNR 1996; Chapter 275). According to these rules, a site must possess integrity of location, design, setting, materials, workmanship, feeling and association and shall meet one or more of the following criteria:

Criterion "a"—Be associated with events that have made an important contribution to the broad patterns of our history;

Criterion "b"—Be associated with the lives of persons important in our past;

Criterion "c"—Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

Criterion "d"—Have yielded, or is likely to yield, important information for research on prehistory or history;

Criterion "e"—Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts.

As mentioned earlier in this report, we did not locate a cultural deposit during subsurface testing on the study area. Consequently, there can be no site significance assessments made at this time.

Site Mitigation Recommendations

Given the presence of intact marine sand deposits on the project area, archaeological monitoring is the recommended mitigation when this parcel is developed. This mitigation measure is considered to be appropriate, because Native Hawaiian burials have been encountered in sand areas in the Kihei area as well as in other locations of Maui.

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APPENDIX A – Photographs 5-15



Photograph 5 – View to the west of BT 1.



Photograph 6 – View to the north of BT 2.



Photograph 7 – View to the east of BT 3.



Photograph 8 – View to the west of BT 4.



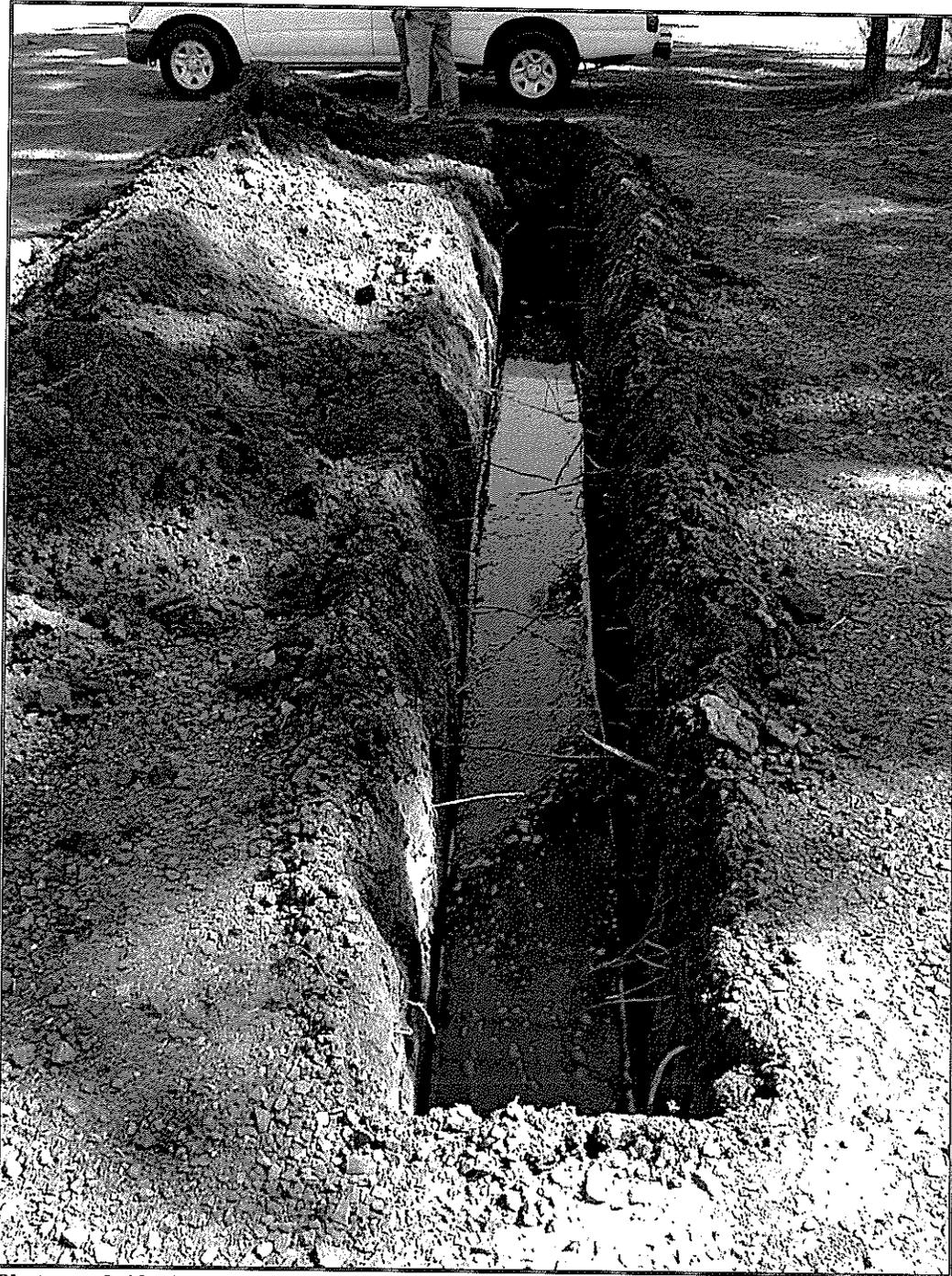
Photograph 9 – View to the south of BT 5.



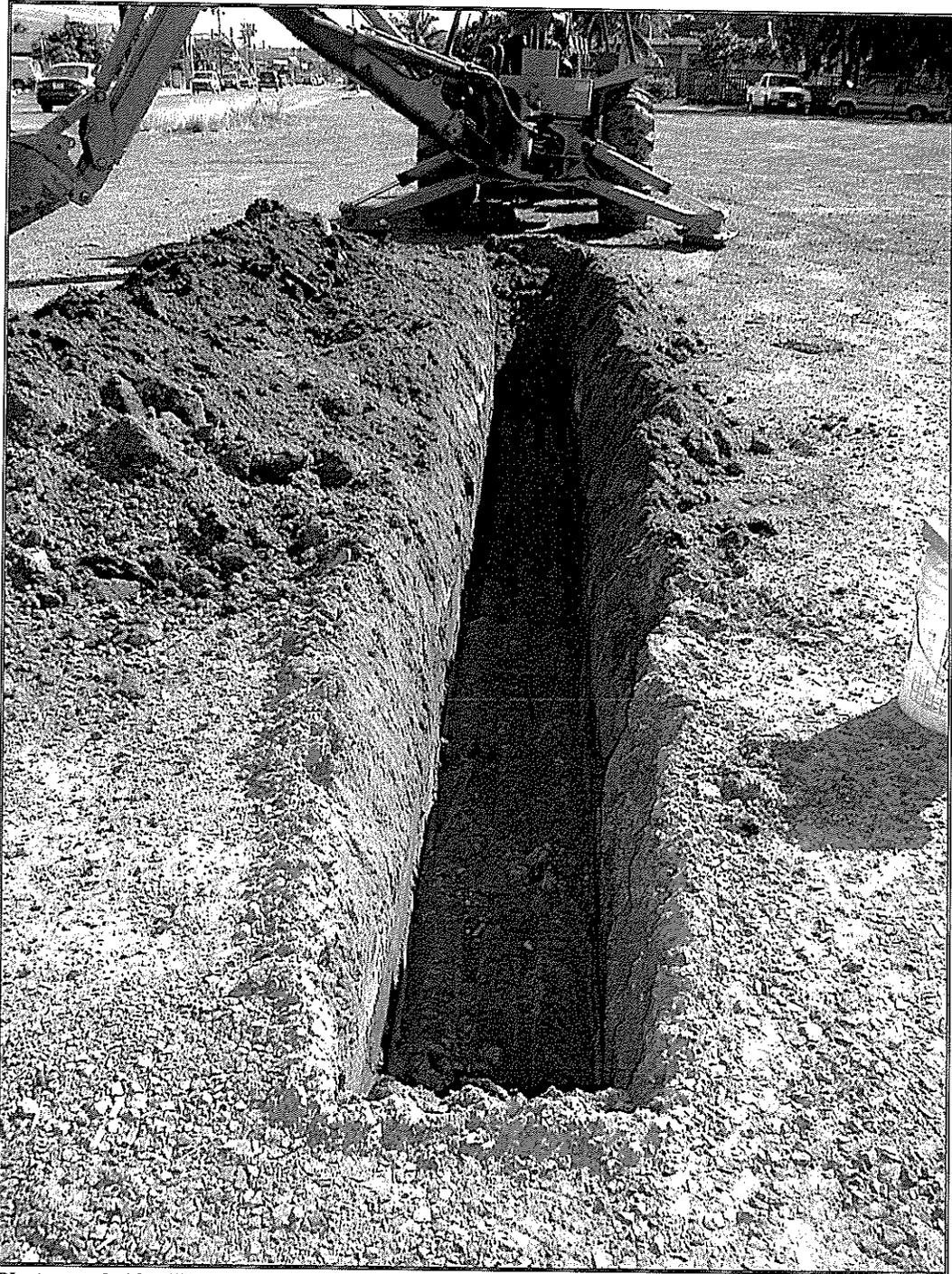
Photograph 10 – View to the east of BT 6.



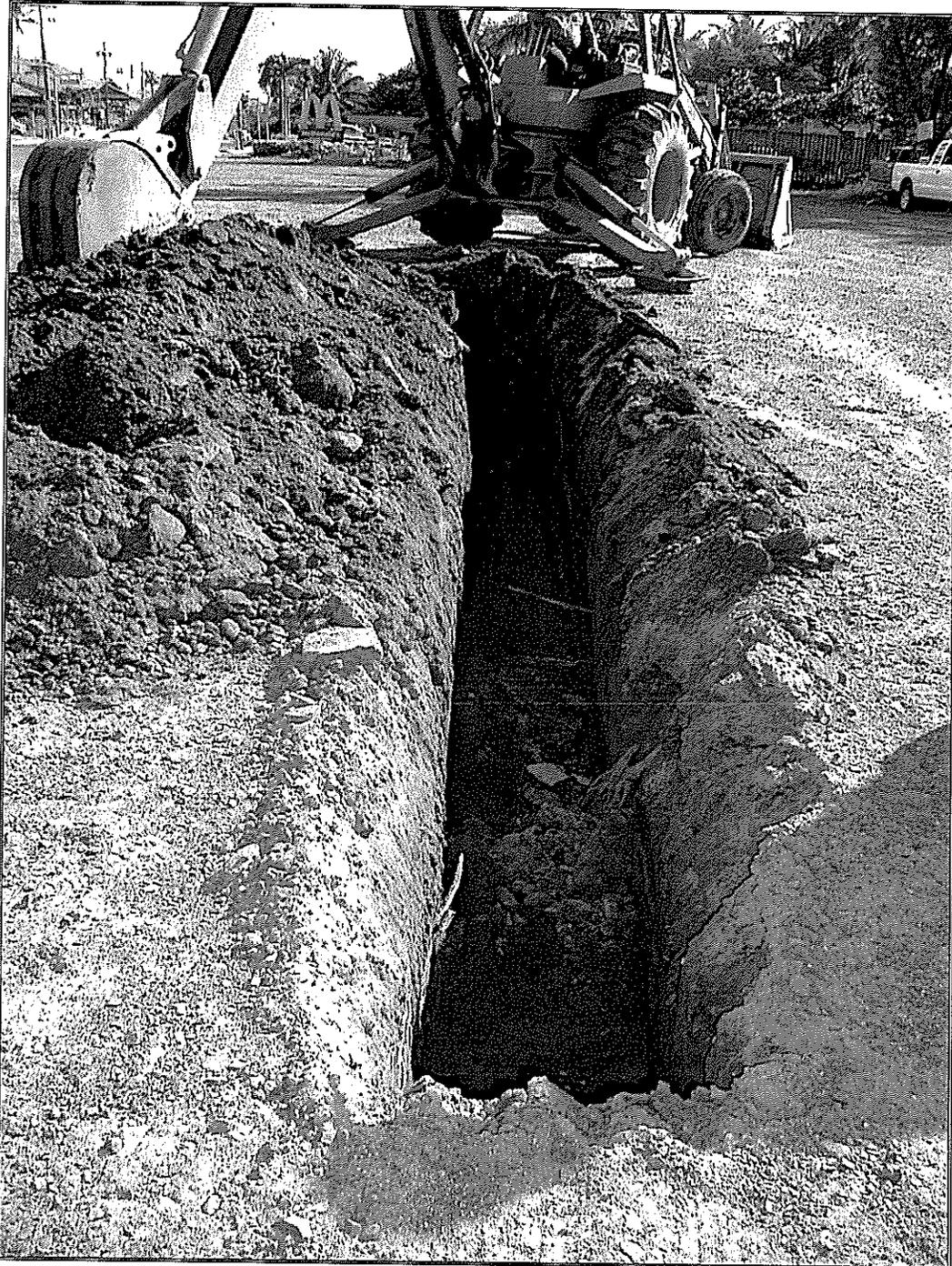
Photograph 11 – View to the east of BT 7.



Photograph 12 – View to the east of BT 8.



Photograph 13 – View to the south of BT 9, South Kihei Road at left.



Photograph 14 – View to the south of BT 10, South Kihei Road at left.



Photograph 15 – View to the north of BT 11, South Kihei Road in right background.

APPENDIX B – Figures 5-15

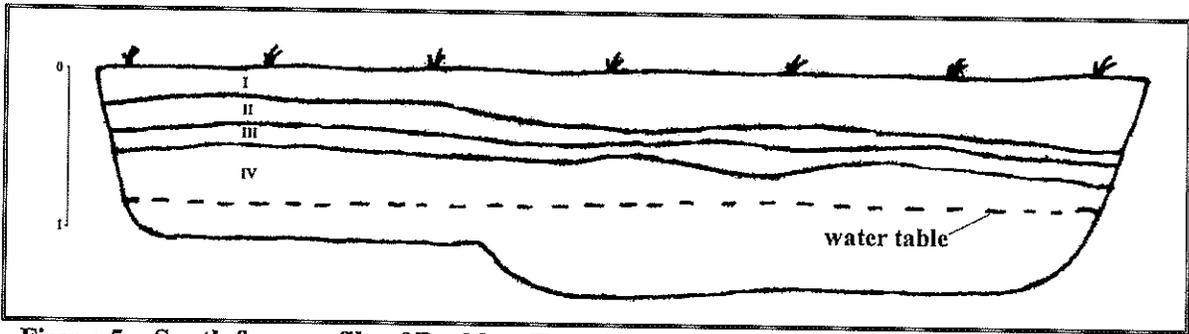


Figure 5 – South face profile of Backhoe Trench 1.

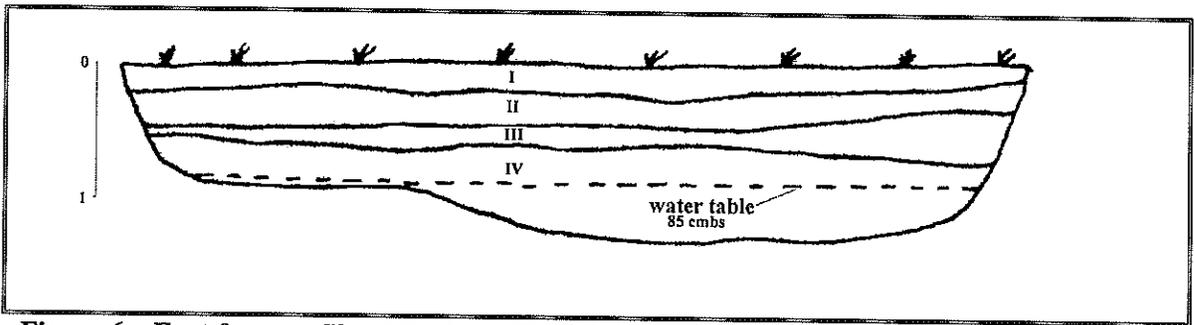


Figure 6 – East face profile of Backhoe Trench 2.

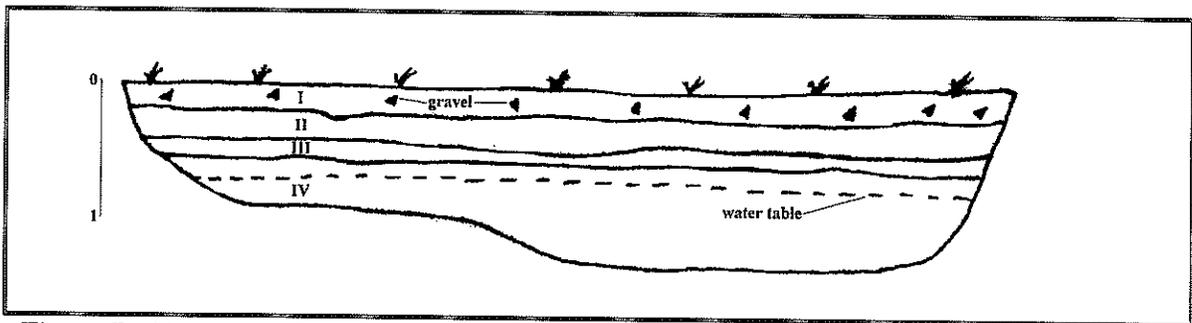


Figure 7 – North face profile of Backhoe Trench 3.

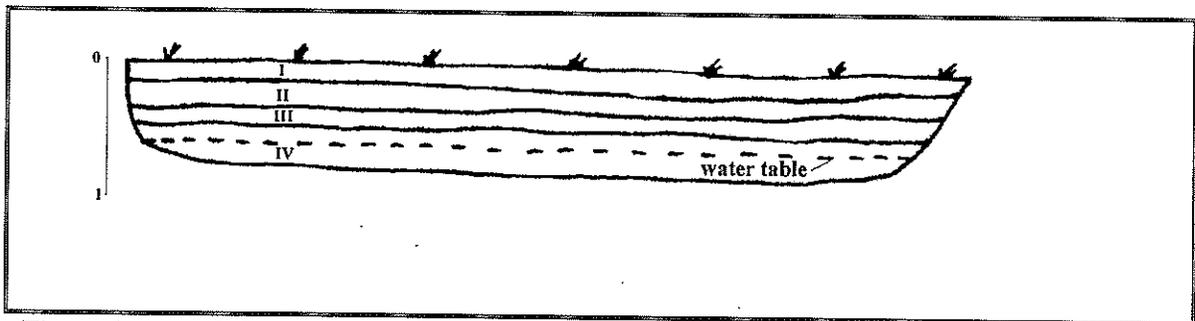


Figure 8 – North face profile of Backhoe Trench 4.

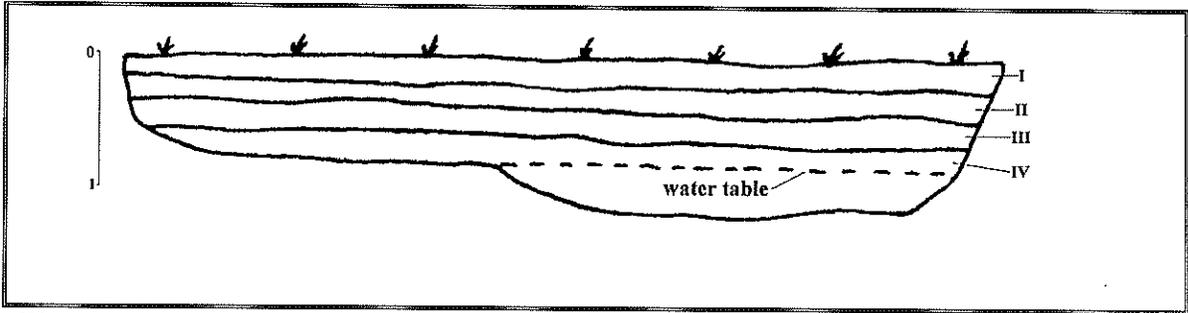


Figure 9 – North face profile of Backhoe Trench 5.

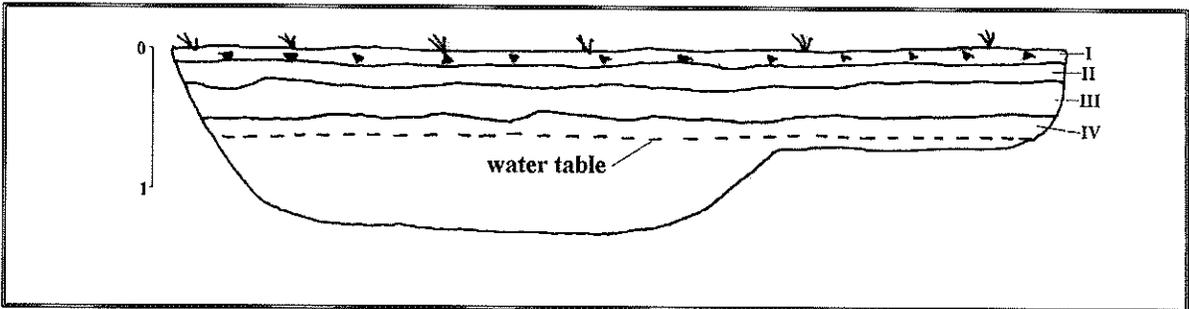


Figure 10 – West face profile of Backhoe 6.

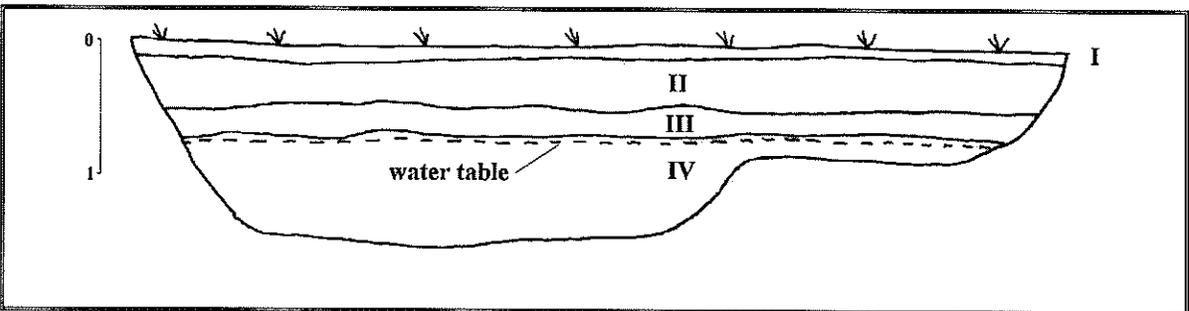


Figure 11 – West face profile of Backhoe Trench 7.

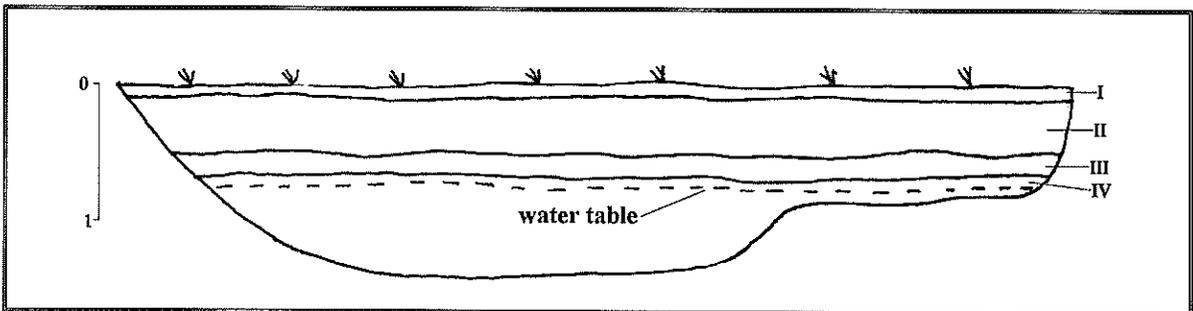


Figure 12 – West face profile of Backhoe Trench 8.

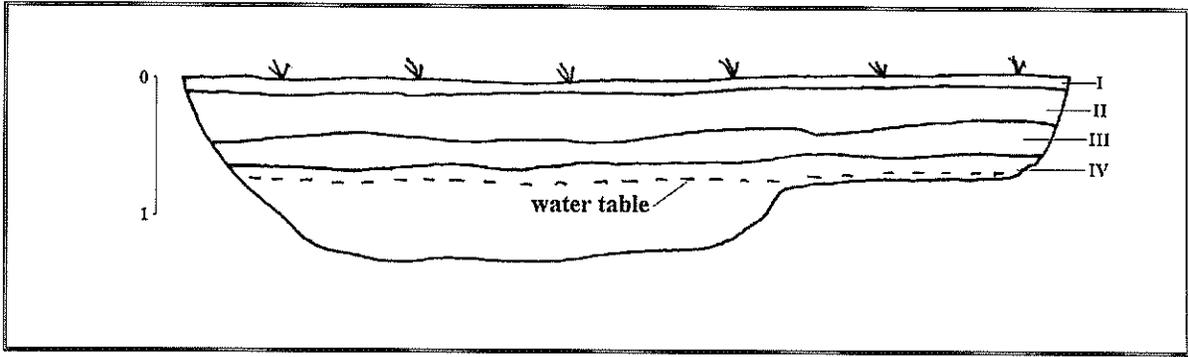


Figure 13 – East face profile of Backhoe Trench 9.

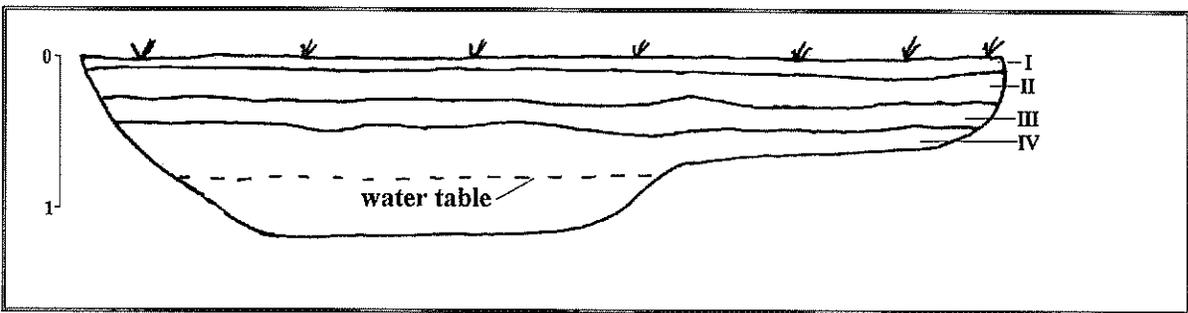


Figure 14 – East face profile of Backhoe Trench 10.

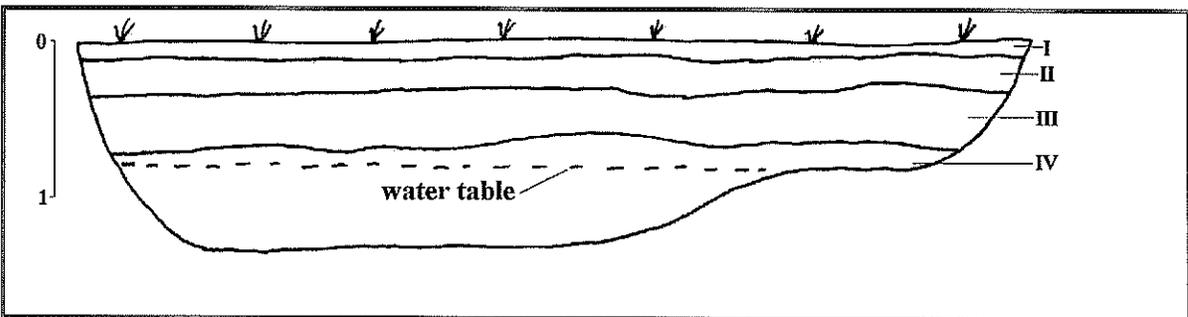


Figure 15 – West face profile of Backhoe Trench 11.

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STATE PARKS

April 3, 2006

Mr. Erik Fredericksen
Xamanek Researches
P.O. Box 880131
Pukalani, Hawai'i 96788

LOG NO: 2006.0483
DOC NO: 0603MK11
Archaeology

Dear Mr. Fredericksen:

**SUBJECT: Chapter 6E-42 Historic Preservation Review -
Archaeological Monitoring Plan for Future On and Off-Site
Construction Activities on Behalf of Mr. Jim Stinson
Waiohuli Ahupua'a, Wailuku District, Island of Maui
TMK: (2) 3-9-007:037, 038, 039, and 040, and 3-9-008: 016**

Thank you for the opportunity to review this plan which was received by our staff on December 8, 2005 (Fredericksen 2005, *An Archaeological Monitoring Plan for a Portion of land Located in Waiohuli Ahupua'a, Wailuku District, Island of Maui [TMK 3-9-07: 37, 38, 39, and 40, and TMK 3-9-08:16]...Xamanek Researches, LLC, ms).*

We have previously provided comments pertaining to the subject parcel. May 2, 2002 we recommended that an archaeological inventory survey be conducted (LOG NO: 29783, DOC NO: 0204CD51), in response to a Draft Environmental Assessment and Applications for Amendment of Conditional Zoning, Change in Zoning, and Special Management Area Permit for the Proposed Stinson & R.C. Ching Families' Kihei Business Complex (Subject ID: CIZ 2001/0014, SM1 2001/0018, EA 2001/0008).

We subsequently reviewed and accepted an archaeological assessment (Fredericksen 2005, *An Archaeological Assessment for a Portion of Land Located in Waiohuli Ahupua'a, Wailuku District, Island of Maui [TMK 3-9-07: 37, 38, 39, and 40 and TMK 3-9-08:16]*) (LOG NO: 2005.1001, DOC NO: 0505MK20). We concurred with the recommendation provided in the report that, although no historic properties were identified during subsurface testing, archaeological monitoring during all construction activities was warranted given the sensitive nature of the area, the proximity of the subject parcel to both named and unnamed fishponds along the coast, and wetland deposits.

The plan conforms to Hawaii Administrative Rules Chapter 13-279 which govern standards for monitoring; the subject plan includes the following provisions. An archaeologist will be on site on a full-time basis and will have the authority to halt excavation in the event that cultural materials are identified. Consultation with Maui SHPD will occur in this event, to determine acceptable course of action. If human burials are identified, work will cease, Maui SHPD, O'ahu SHPD and the Maui/Lana'i Islands Burial Council will be notified, and compliance with procedures outlined in HRS 6E-43 will be followed.

Mr. Erik Fredericksen
Page 2

Coordination meetings with the construction crew will be held prior to project initiation. The plan further indicates that an acceptable report will be submitted to this office within 180 days of project completion.

Please notify our Maui and O'ahu offices, via facsimile, at onset and completion of the project and monitoring program.

The plan is acceptable. We believe there will be "no historic properties affected" with the implementation of this monitoring plan. If you have any questions, please contact Dr. Melissa Kirkendall of the State Historic Preservation Division, Maui Section, at (808) 243-5169.

Aloha,



Melanie Chinen, Administrator
State Historic Preservation Division

MK:kf:dlb

cc: Bert Ratte, DPWEM, County of Maui, FAX 270-7972
Michael Foley, Director, Dept. of Planning, FAX 270-7634
Maui Cultural Resources Commission, Dept. of Planning, 250 S. High Street, Wailuku, HI 96793

FROM : ERIK FREDERICKSEN

FAX NO. : 8085726118

Jun. 01 2005 09:51AM P2

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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

May 23, 2005

Mr. Erik Fredericksen
Xamanek Researches
P.O. Box 880131
Pukalani, Hawai'i 96788

LOG NO: 2005.1001
DOC NO: 0505MK20

Dear Mr. Fredericksen:

**SUBJECT: Historic Preservation Review - 6E-42 - Archaeological Assessment Survey Draft Environmental Assessment and Applications for Amendment of Conditional Zoning, change in Zoning, and Special Management Area Permit for the Proposed Stinson & R.C. Ching Families' Kihei Business Complex (Subject I.D.: CIZ 2001/0014, SM1 2001/0018, EA 2001/0008) Waiohuli Ahupua'a, Wailuku District, Island of Maui
TMK (2) 3-9-007:037, 038, 039, 040, & 3-9-08:016**

Thank you for the opportunity to review this report which our staff received on April 5, 2005 (Fredericksen 2005, *An Archaeological Assessment for a Portion of Land Located in Keokea Ahupua'a, Wailuku District, Island of Maui [TMK 3-9-07:37, 38, 39, and 40, and TMK 3-9-08:16]...Xamanek Researches ms*). We have previously provided comments on the above actions (Log 29783/Doc 0204CD51) and recommended an archaeological inventory survey to determine the likelihood of historic properties present in the project area.

The background section acceptably establishes the ahupua'a settlement pattern and predicts the likely site pattern in the project area. The historical information provided summarizes the history of the post-contact period land uses. The summary of previous archaeological work in the area provides a baseline for the current work. One comment on page 11, Kula Kai Fishponds, paragraph 1: the second line should read "northwest" not southwest.

The survey has adequately covered the project area documenting no historic properties. Subsurface testing (eleven backhoe trenches) were also negative for evidence of cultural deposits. The trenches all yielded evidence of extensive fill overlaying a sand deposit. The probable depositional sequence included recent historic efforts to fill in wetlands subject to periodic flooding. The project area is very close to (inland of) an unnamed fishpond in Keokea, and in addition to the wetland deposits, the area was likely an area of habitation. An extensive habitation deposit is located on the south side of a wetland area along Halama Street (SIHP 50-50-10-5003).

Erik Fredericksen
Page 2

We agree with the recommendation that monitoring is an appropriate mitigation against potential impacts to historic properties during any development on the subject parcel. We will anticipate receipt of a monitoring plan for review and acceptance.

We find this report to be acceptable. As always, if you disagree with our comments or have questions, please contact Dr. Melissa Kirkendall (Maul/Lana'i SHPD 243-5169) as soon as possible to resolve these concerns.

Aloha,



MELANIE A. CHINEN, Administrator
State Historic Preservation Division

MK: kf

- c: Bert Ratte, DPWEM, County of Maui
Michael Foley, Director, Dept of Planning, 250 S. High Street, Wailuku, HI 96793
Maui Cultural Resources Commission, Dept. of Plng, 250 S. High St, Wailuku, HI 96793

**An Archaeological Monitoring Plan for a portion of land
Located in Waiohuli *Ahupua`a*, Wailuku District,
Island of Maui
(TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16)**

Prepared On behalf of:

**Mr. Jim Stinson,
Stinson Trust
Wailuku, Maui**

Prepared by:

**Xamanek Researches, LLC
Pukalani, Maui
Erik Fredericksen**

30 November 2005

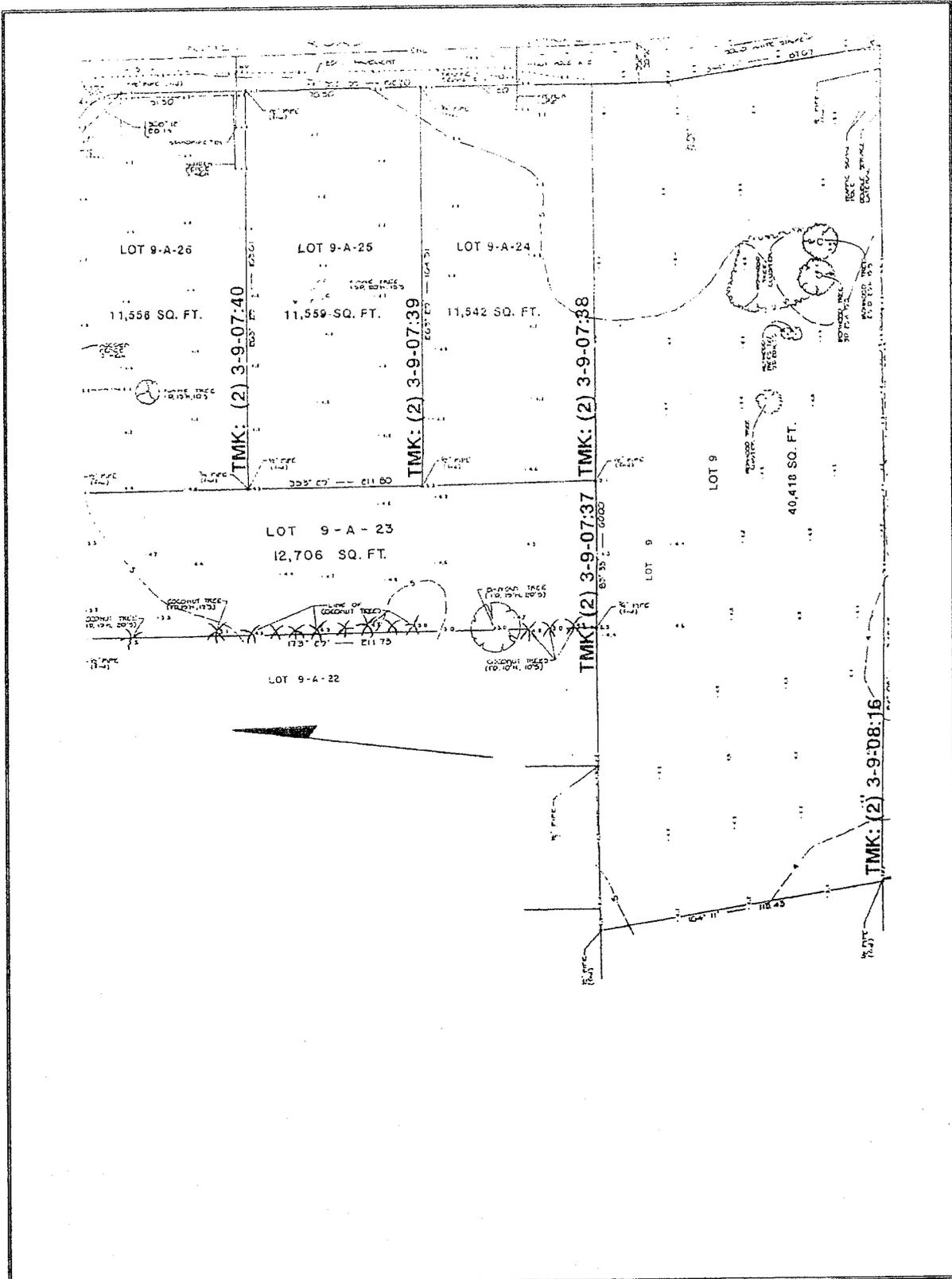


Figure 2: Plan view of the project area.

INTRODUCTION

Xamanek Researches¹ conducted an archaeological inventory/assessment survey on a c. 2-acre portion of land in Waiohuli *ahupua`a*, Wailuku District, Island of Maui (TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16). This inventory/assessment survey was carried out on behalf of the Stinson Trust². The study area is located in a mixed residential and business community of Kihei, Maui. The archaeological survey was conducted on behalf of Mr. Jim Stinson, WAISCO, Inc., Wailuku, Maui. Fieldwork for this survey was carried out in December 2004 and January 2005. The State Historic Preservation Division (SHPD) approved the assessment survey report in a 23 May 2005 review letter (DOC NO: 0505MK20).

There was no evidence of significant material culture remains encountered during subsurface testing on the level project area. However, intact marine sand deposits were located in all 11 test instances on the study area. Test results indicate that the project area has been impacted by previous earth moving activities associated with the placement of fill. The fill was a maximum of 70 cm in depth in tested locations on the project area.

Given the presence of marine sand deposits on the 5 parcels, archaeological monitoring was the recommended mitigation for the project area. This mitigation step is considered to be appropriate, because Native Hawaiian burials have been encountered in sand deposits in Kihei as well as in other locations of Maui. The following monitoring plan has been prepared on behalf of Mr. Jim Stinson and covers all five parcels that comprise the project area. This plan may be used for future on- and off-site improvements for any or all of the five pertinent parcels.

¹ Xamanek Researches became Xamanek Researches, LLC, a Hawaii-based Limited Liability Company in February 2005.

THE STUDY AREA

The project area (TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16) lies in relatively close proximity to the coast, and contains Jaucas Sand and marine sand deposits (TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16). It is estimated that the study area lies 350 meters to the east of the Kihei shoreline (Figures 1 and 2). There are previously identified sites along this general portion of the coast, including Sites 50-50-09-1288 and 1738—Kalepolepo Fishpond and Ko'ie'ie Fishpond, respectively. In addition, habitation area remnants have been identified in the back dune marsh areas directly to the west of South Kihei Road and northwest of the project area (i.e. Sites 5003 and 5060). Given the location of the Stinson Trust parcels, there is a possibility that human burials and/or remnants of subsurface cultural layers may be present in the untested portions of the project area.

The project area lies on the *makai* (west) side of South Kihei Road in Waiohuli *ahupua`a*, Wailuku District, Kihei, Maui. Dune and marine sand deposits underlie much of this road and extend to the east and west. While there were no significant material culture remains located during the assessment survey, the possibility exists that significant cultural materials could be present.

ARCHAEOLOGICAL MONITORING PLAN

Scope of monitoring

The scope of this monitoring plan includes having an archaeological monitor present during all subsurface earthmoving activities scheduled for the Stinson Trust parcel(s). Actual on-site time and specific actions to be followed in the event of inadvertent discoveries will be discussed and agreed upon by the general contractor and the archaeological consultant at a pre-construction meeting/phone conference held for this purpose. Additional meetings may be called, if either the monitoring archaeologist or contractor believes that other relevant information should be disseminated. As previously mentioned, this plan covers this current project as well as any future on-site or off-site

improvements for the subject parcel (TMK: : 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16).

Monitoring methodology

Given the near coastal location of the project area, there is a possibility that significant material culture remains may be inadvertently disturbed during earthmoving activities in this portion of Kihei, Maui. Possible cultural materials could include subsurface habitation deposits, human burials and/or human skeletal remains.

Close cooperation between the monitoring archaeologist and construction personnel is important to a successful monitoring program. The monitoring program will follow the 12 conditions listed below:

- 1) The contractor shall be responsible for ensuring that the archaeological consultant is aware of all pertinent construction schedules and that the monitor is present for all subsurface excavation activities on this coastal parcel.
- 2) Both the archaeological consultant and the contractor are responsible for ensuring that on-site work is halted in an area of significant findings and to protect any such find from any further damage (i.e., construction fencing, protective covering, etc.). The State Historic Preservation Division will recommend appropriate mitigation actions. The SHPD Burial Sites Program, the SHPD Maui office, and the Maui/Lana`i Islands Burial Council (MLIBC) will be consulted in the event that human remains are found. (Change work order)
- 3) In the event of the discovery of human remains, work shall cease in the immediate find area. The monitoring archaeologist will be responsible for notifying the SHPD Maui office and the Historic Preservation Division Burials Program (HPDBP), which, in consultation with the Maui/Lana`i Islands Burial Council, will determine the appropriate mitigation measures. This notification will include accurate information regarding the context and composition of the find. (Change work order)
- 4) Xamanek Researches, LLC will work in compliance with Hawai`i Revised Statutes Chapter 6E (procedures Relating to Inadvertent Discoveries).
- 5) The monitoring archaeologist will have the authority to closedown construction activities in areas where potentially significant discoveries have been made until they have been properly evaluated. Normally, construction activities may continue in unaffected portions of the project area. (Change work order)

- 6) Field procedures to be followed for documentation of discovered cultural features or human skeletal remains: a) standard field methods including recordation of profiles showing stratigraphy, cultural layers, etc.; b) mapping and photographing of finds other than human remains; c) and excavation of cultural materials and/or exposed features.
- 7) The SHPD Maui archaeologist shall be notified and consulted with regarding treatment of identified features such as cultural layers, artifact or midden concentrations, structural remains, etc., considered to be of significance under S13-279-2 (definitions).
- 8) The contractor should take into account the necessity for machine excavation at a speed slow enough to allow for reasonable visual inspection of the work. The monitoring archaeologist must make a “best effort” to search for significant material culture remains (i.e. artifacts, features, midden, skeletal remains, etc.). Machine excavation speed will need to be slowed in an area where significant material culture remains have been identified. (Change work order)
- 9) Significant archaeological discoveries, if they occur, shall be protected and identified by construction “caution” tape, fencing, or other reasonable means, until the SHPD Maui office and the archaeological consultant decide appropriate mitigation actions. All recovered material culture remains—with the possible exception of charcoal samples for radiometric analysis—will remain on Maui. Standard laboratory methods shall be utilized by Xamanek Researches, LLC in the event that cultural materials are recovered during monitoring and/or mitigation work. Cultural materials will be curated by archaeological consultant (change work order)
- 10) One monitor in most instances will carry out the necessary fieldwork. Tasks will include observation of grubbing and earth-moving activities. However, the SHPD and the MLIBC require that one archaeological monitor be assigned to each piece of major earth-moving equipment in sand dune areas or other culturally sensitive locations. (Change work order if more than one piece of machinery is to be utilized)
- 11) In the event of night work, the general contractor shall supply adequate lighting for the onsite monitor.
- 12) Chapter 6E-11 (a) specifies the following “It shall be unlawful for any person or corporate, to take, appropriate, excavate, injure, destroy, or alter any historic property or aviation artifact located on the private lands of any owner thereof without the owner’s written permission being first obtained. It shall be unlawful for any person, natural or corporate, to take, appropriate, excavate, injure, destroy, or alter any historic property located upon lands

owned or controlled by the State or any of its political subdivisions, except as permitted by the department.”

Field methods utilized shall include photographic recordation (where appropriate), artifact excavation (recovery and recordation), profile documentation of cultural layers and stratigraphy, excavation and recordation of exposed features, and mapping of all pertinent features on an appropriate site map. A daily log (field notes) of activities and findings will also be kept. Gathered information shall be utilized in the preparation of the monitoring report to be submitted to the SHPD.

In the event human skeletal remains are inadvertently disturbed, the SHPD Maui office, the HPDBP and the Maui/Lana`i Islands Burial Council shall be notified, and appropriate mitigation actions determined (photographs of human skeletal remains will not be taken).

A supervisory archaeologist may periodically visit the monitoring site as often as is necessitated by the nature of the construction activities and archaeological findings. If significant discoveries are made, appropriate mitigation measures will be discussed with the SHPD Maui office.

Xamanek Researches, LLC shall curate all cultural materials recovered from this monitoring project on Maui, with the exception of human remains. When analysis is completed, recovered material culture remains will be turned over to the appropriate parties. Long-term curation arrangements of significant material culture remains will be approved by the SHPD and the landowner.

A draft monitoring report detailing the results of this monitoring program will be prepared. This draft report shall be submitted to the State Historic Preservation Division within 180 days of the completion of fieldwork, for comment and approval. Any recommended changes and/or corrections will be incorporated in the final monitoring report for this single-family residential construction project. Any future on-site or off-site improvements for the Stinson Trust parcels (TMK: 3-9-07: 37, 38, 39 and 40, and TMK: 3-9-08: 16) will be covered by this monitoring plan, but may require separate monitoring reports.

APPENDIX **D**

Cultural Impact Assessment

CULTURAL IMPACT ASSESSMENT

For the

PROPOSED

Kihei Walgreens

December 2014



Hana Pono, LLC - PO Box 2039 Wailuku, HI 96793 – hanapono@gmail.com

CULTURAL IMPACT ASSESSMENT

For the

PROPOSED

Kihei Walgreens

TMK: (2)3-9-007:037-040; (2)3-9-008:016

Prepared by:

Hana Pono, LLC

PO Box 2039

Wailuku, Maui, Hawai'i 96793

December 2014

Management Summary

Report	Cultural Impact Assessment for the proposed Kihei Walgreens project
Date	December 2014
Project Location	County of Maui; Kula Moku; Waiohuli Ahupua‘a, TMK(s): (2)3-9-007:037; (2)3-9-007:038; (2)3-9-007:039; (2)3-9-007:040; (2)3-9-008:016
Acreage	Approximately 2 acres
Ownership	Stinson Associates
Developer/Applicant	Walgreen of Maui, Inc.
Project Description	The proposed project will include a Walgreen’s retail store and parking lot.
Region of Influence	Waiohuli ahupua‘a, Kula Moku
Agencies Involved	SHPD/DLNR, Maui County
Environmental Regulatory Context	The undertaking is subject to both State and County zoning regulations, and other environmental regulations
Results of Consultation	No significant impacts to cultural practices, resources, or beliefs. Lands in question have long been disturbed by development of modern Kihei.
Recommendations	<ul style="list-style-type: none"> • Adherence to all applicable rules governing earth-disturbance activities • Adherence to accepted SHPD-MLIBC archaeological monitoring plans

Cultural Summary

Walgreen of Maui, Inc. is proposing the construction of a Walgreens retail store on the corner of South Kihei Road and Nohokai Street in Kihei on property identified by Tax Map Key (TMK) numbers (2)3-9-007:037; (2)3-9-007:038; (2)3-9-007:039; (2)3-9-007:040; (2)3-9-008:016 (the Property). A portion of the Property is currently utilized as an open air souvenir market and the remainder is vacant. The Property sits in the moku of Kula and the ahupua'a of Waiohuli. The beach lot homesteads underneath the modern (1911) lots are called Waiohuli - Keokea, as are the mauka homesteads, because the two ahupua'a were always so closely associated. In the Alexander Map (Alexander) the boundary between Waiohuli and Keokea clearly intersects the shore at La'ie. If one uses this early and probably accurate reference, the Property north of Lipoa is well inside Waiohuli. The Property is adjacent to the McDonald's restaurant and other previously disturbed lands. Whatever cultural practices or resources were practiced there in ancient times have long been abandoned and paved over in the construction of modern-day Kihei.

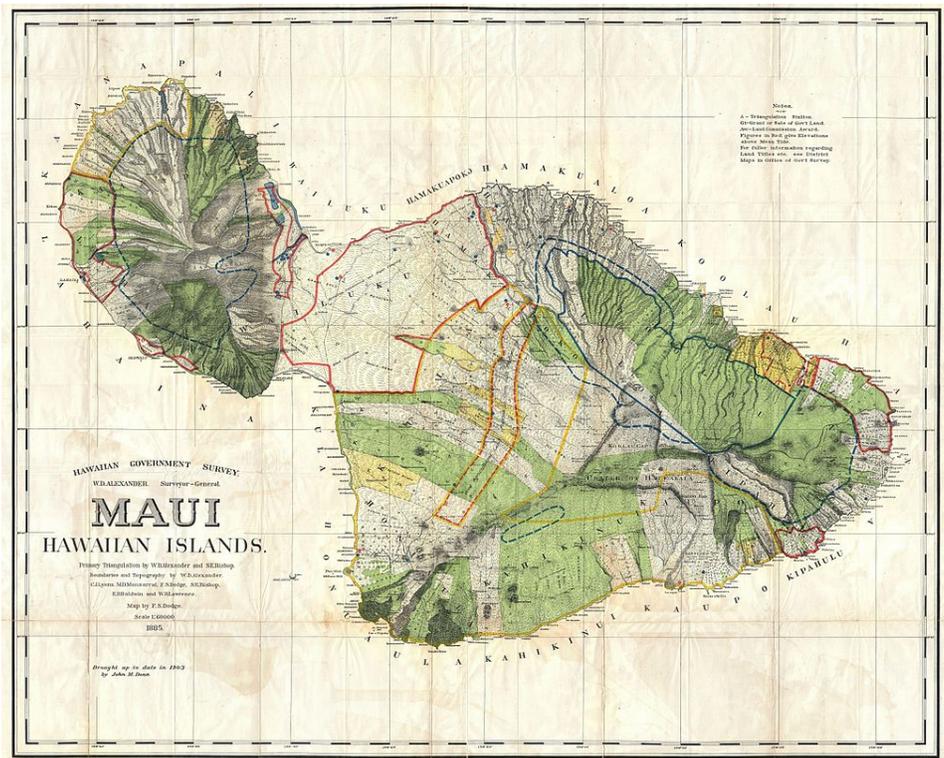


Figure 1: Alexander Map 1885

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Introduction

Hana Pono LLC completed a report for the Cultural Impact Assessment of the proposed Kihei Walgreens project at TMK(s): (2)3-9-007:037; (2)3-9-007:038; (2)3-9-007:039; (2)3-9-007:040 and (2)3-9-008:016 (the Property). This study was completed in accordance with State of Hawaii Chapter 343, Hawaii Revised Statutes (HRS), and the State of Hawaii Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts (1997).

Guiding Legislation for Cultural Impact Assessments

It is the policy of the State of Hawaii under Chapter 343, HRS, to alert decision makers about significant environmental effects that may occur due to actions such as development, re-development, or other actions taken on lands. Articles IX and XII of the State Constitution, other state laws, and the courts of the state require the promotion and preservation of cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups.

The Guidelines for Assessing Cultural Impacts, as adopted by the Environmental Council, State of Hawaii 1997 and administered by the Office of Environmental Quality Control, including HAR Title 11 Chapter 200-4(a), provides guidance for any assessment of a project that may significantly affect cultural resources. Act 50, Session Laws of Hawaii 2000, amended the definition of “significant effect” under Chapter 343, HRS to include adverse effects on cultural practices.

Goal and Purpose

The goal of this study is to identify any and all Native Hawaiian, traditional, historical, or otherwise noteworthy practices, resources, sites, and beliefs attached to the Property in order to analyze the impact of the proposed development on these practices and features. Consultations with lineal descendants or kupuna (Hawaiian elders) with knowledge of the area in gleaning further information are a central part of this study.

Scope

The scope of this report compiles various historical, cultural, and topographical accounts and facts of the Property and vicinity.

The geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment. An ahupua'a is usually the appropriate geographical unit to begin an assessment of cultural impacts of a proposed action, particularly if it includes all of the types of cultural practices associated with the project area. In some cases, cultural practices are likely to extend beyond the ahupua'a and the geographical extent of the study area should take into account those cultural practices. (OEQC, Guidelines for Assessing Cultural Impacts, Nov 9, 1997)

Data will be compiled beginning with the first migrations of Polynesians to the area, progressing through the pre-contact period of Hawaiian settlement, containing data on the post-contact period, through to the current day and any cultural practices or beliefs still occurring on the Property and in the vicinity. Hawaiian kupuna with ties to the area will be interviewed on their knowledge of the area and its associated beliefs, practices, and resources. Additionally, any

other individuals or organizations with expertise concerning the types of cultural resources, practices and beliefs found within the geographical area in question will be consulted.

The Property

The Property is located in the State of Hawaii, County of Maui, at TMK(s): (2)3-9-007:037 (2)3-9-007:038; (2)3-9-007:039; (2)3-9-007:040 and (2)3-9-008:016 (the Property). The Property is in the moku of Kula, the ahupua‘a of Waiohuli, and is located at the intersection of South Kihei Road and Nohokai Street.

Approach & Method

The approach taken in this study was two-fold. Foremost, historical, involving as appropriate, a review of: mahele (land division of 1848), land court, census and tax records, previously published or recorded ethnographic interviews and oral histories; community studies, old maps and photographs and other archival documents. Secondly, oral interviews with living persons with ties, either lineal or cultural, to the Property and the surrounding region.

Objectives

The objectives of the Cultural Impact Assessment are as follows:

- to compile and identify historical and current cultural uses of the Property and in the vicinity,
- to identify historical and current cultural beliefs & practices associated with Property and in the vicinity,
- to assess the impact of the proposed action on the cultural resources, practices, and beliefs.

Tasks

Data gathered combined oral interviews of knowledgeable kupuna and families/individuals with long-standing ties to the area with all available written and recorded background information.

Archival Research

All sources of historical written data, old maps, and literature were culled for information.

Oral Interviews

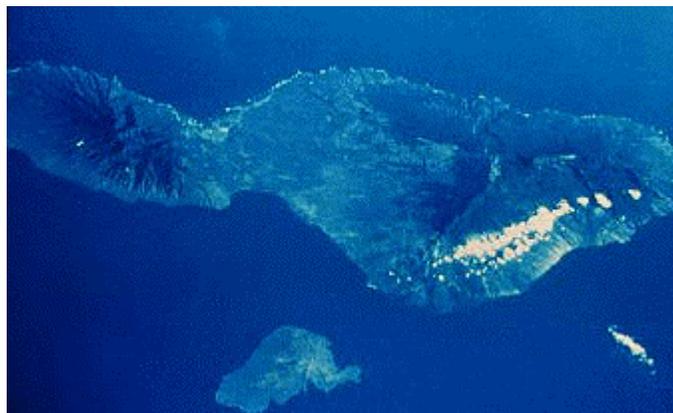
Tasks completed for oral interviews included: identification of appropriate individuals to be interviewed, interview recorded in writing, compilation of pertinent data.

Historical & Current Cultural Resources & Practices

The island of Maui is comprised of twelve (12) traditional land districts, called moku. Each moku is made up of numerous ahupua‘a, smaller land divisions wherein a self-inclusive community could find all the things needed for a satisfactory life. Usually these ahupua‘a ran from the heights of the mountain peak to the edge of the outer reef like a giant pie slice, although many ahupua‘a did not fit this template. As previously mentioned, the Property resides in the moku of Kula and the ahupua‘a of Waiohuli. Handy relates that, “Kula was always an arid region, throughout its long, low seashore, vast stony kula [open country] lands and broad

uplands. Both on the coast, where fishing was good, and on the lower westward slopes of Haleakalā a considerable population existed” (ESC Handy, 114). The moku of Kula is so called for its kula lands, meaning broad open expanses, likened to pasture land by the ranchers of the last century.

Although Kihei is one of the more dry areas of Maui in present time, it once was home to many fresh and brackish wetlands. Such as the wisdom of the ahupua‘a system, the events mauka (upland) effected the land below. The mauka portion of Kula underwent major deforestation for farming and ranching and therefore, rainwater was less able to filter into the ground and recharge the ponds near the coast. The Honolulu Star-Bulletin and Advertiser reported in 1962, “a secondary result of the clearing of the Kula forests, he said, was the destruction of extensive fresh water ponds in Kihei, on the Mā‘alaea Bay coast below Kula. When the forest was cleared, water was free to rush down the mountain, carrying soil from Kula to the coast and filling with mud the ponds for which Kihei was once famous” (Sterling, 245). This destruction started with the large-scale deforestation of the native Sandalwood in the 1800’s and although short-lived was a major source of commerce for this area in those times.



The Property has been severely disturbed from its original and unaltered state for many decades, by the effects of building the modern-day Kihei. Any resources or practices occurring traditionally in the area are now non-existent and would have been obliterated.

First migrations

Traditional stories start with the creation chant called “Kumulipo.” The Kumulipo brings darkness into light. Embedded in this all-encompassing chant includes the tale of the coming of the Hawaiian Islands through the mythical stories of Pele and another demigod named Maui who, with his brothers, pulls up all the islands from the bottom of the sea. The latest and last physical appearance of Pele occurred as late as mid-1800s when the Fire Goddess flowed from the top of the southern slopes of Haleakalā, south of the Property, down through Honua‘ula and landing at the surf of Mākena and southward. In the Hawaiian Annual published by Thomas Thrum and James Dana's "Characteristics of Volcanoes", are reported Father Bailey's statements of his oral interviews explaining that the last flow had occurred in 1750 (Sterling 1998: 228). Many of the lava flows in the summit depression and in the Ulupalakua to Nu‘u area were dark black and bare ‘a‘ā (rough, jagged type of lava landscape). The two freshest lava flows run near

La Perouse Bay. The upper flow broke out of a fissure near Pu‘u Mahoe and the lower flow broke out at Kalua o Lapa cone. Both flows contain large balls or wrapped masses of typical ‘a‘a found throughout Hawai‘i.

The occupation of the Hawaiian archipelago after its mythical creation came in distinct eras starting around 0 to 600 A.D. This was the time of migrations from Polynesia, particularly the Marquesas. Between 600 and 1100 A.D. the population in the Hawaiian Islands primarily expanded from natural internal growth on all of the islands. Through the course of this period the inhabitants of the Hawaiian Islands grew to share common ancestors and a common heritage. More significantly, they had developed a Hawaiian culture and language uniquely adapted to the islands of Hawai‘i which was distinct from that of other Polynesian peoples (Fornander, 222).

Between 1100 and 1400 A.D., marks the era of the long voyages between Hawai‘i and Tahiti and the introduction of major changes in the social system of the Hawaiian nation. The chants, myths and legends record the voyages of great Polynesian chiefs and priests, such as the high priest Pa‘ao, the ali‘inui (Head Chief) Mō‘ikeha and his sons Kiha and La‘amaikahiki, and high chief Hawai‘iloa. Traditional chants and myths describe how these new Polynesian chiefs and their sons and daughters gradually appropriated the rule over the land from the original inhabitants through intermarriage, battles and ritual sacrifices. The high priest Pa‘ao introduced a new religious system that used human sacrifices, feathered images, and enclosed heiau (temples) to facilitate their sacred religious practices. The migration coincided also with a period of rapid internal population growth. Remnant structures and artifacts dating to this time suggest that previously uninhabited leeward areas were settled during this period.

Settling of Kula Moku & Ahupua‘a

In ancient times the surrounding areas makai from the Property were known for their fresh (brackish) water ponds that would fill up in times of rain and become dry during the summer months. Previously, there were many of these types of ponds that have now been filled in for development. There were no perennial streams here and the water supplied by these ponds and freshets of water that filled the gulches were an important lifeline for these peoples.

With its gentle and open white sand beaches, the coastal areas of Kula were surely a favorite location for fisherman and their families. Accounts tell of a large population on the coast with much bounty from the ocean, not only by fishing the open sea, but also by the construction of fishponds, gathering limu (seaweed), and diving for octopus, lobster, and other marine life. The fishing grounds were accessed from upcountry lands by mauka-makai trails.

Inhabitants of this region relied on vegetable foods from other areas of the island. They possibly obtained kalo (taro) from across the Mā‘alaea plain in Waikapū and uala (sweet potato) from the mauka slopes of Haleakalā. The Property looks up to two small hills on the flank of Haleakalā: Pu‘u o Lono (hill of Lono or Hill of News) on the northern boundary of Waiohuli and Kaono‘ulu ahupua‘a, and Pu‘u o Kali (Hill of Waiting), on the southern boundary with Kēōkeke Ahupua‘a. Now mauka lands are dry grazing land, but before 1850, uphill lands from Kalepolepo to Kama‘ole were heavily farmed. From the time of leeward expansion in 1350, sweet potatoes were farmed in the Kula Moku. Handy and Handy elaborate on the lands of the moku, “there were some patches of upland taro, not irrigated; but this was a notable area for sweet potato, which,

combined with the fishing, must have supported a sizable population although it cannot be counted as one of the chief centers” (272).

Fishponds

Three of Maui’s four leeward fishponds famous for their mullet are in Waiohuli: Kalepolepo (Ka’ie’ie), Waiohuli Kai, Kēōkea Kai, all located in Waiohuli Ahupua’a (Kolb Report on Kalepolepo 1995:63). Kalepolepo fishpond has been restored by Ka ‘Ao’ao o Nā Loko I’a o Maui and the traditional name Ko’ie’ie Loko I’a redeemed. Remains of a small pond whose name has been lost, exist in Kēōkea Ahupua’a, land that was retained as Crown land in the Mahele. The beach area adjacent to the project site rests between the two largest fishponds: south of Waiohuli Kai fishpond, and north of Kēōkea Kai fishpond. Obviously Waiohuli’s most valuable resource was protein food produced by traditional methods of aquaculture.

Kihei Wetlands

Wetlands were a habitat for seabirds, shellfish, and native plants. Early reports and maps of Kīhei (show lowland areas adjacent to the beach that look like wetlands (W.D. Alexander & S.E. Bisho triangulations Map by F.S. Dodge, 1885, updated in 1903 by John M. Donn.) Deforestation in the late 1850s changed the climate and groundwater for this area (*Sites of Maui* p. 245.) and the only surviving wetland is at La’ie, 300 yards south of the project site. A Department of Commerce and Labor 1912 map of Maui West Coast from Keawakapu to Kalepolepo surveyed by J.C. Gauger shows La’ie pond as the only inland pond on this coast.

By the early 1900s and perhaps 50 years earlier, clearing forests in upland Kula for farming and cattle ranching resulted in changed rainfall patterns and less ground water, because up to 65% of groundwater is created from forest condensation drip. Before deforestation, forest drip not collected by catchment ran down gulches and through lava tube springs to Waiohuli-Kēōkea lowlands, allowing wetlands to exist, despite a lack of perennial running streams.

Without forests, the Kula moku experienced less rainfall, lost ground water and downhill Kihei became much drier. A 1911 letter in Ke Aloha ‘Aina Hawaiian Newspaper describes a letter from Charles and Eleanor Wilcox to the Governor expressing the anger, “Nui Ka Huhū o Nā Po’e Lawe ‘Aina o Kula Maui” concerning devastation of Waiohuli-Kēōkea mauka trees and resulting hardships on land holders. They urged the Governor to pass a law requiring those who cut down the trees to replant shade trees. (Ke Aloha ‘Aina).

A 1949 University of Hawaii Soest aerial map of Kawililipoa area includes the current Property, part of a dry, sandy flat. Today, ground water in Kīhei coastal area is near the surface, and wells in lands adjacent to the Property are just 6-8 feet deep. A Territory of Hawaii 1911 survey of Waiohuli-Kēōkea homesteads indicates a windmill was located on property just north, across Nohokai Street from the Property. The windmill was likely the site of a well.

Fishing

Fishing practice in early Hawaii consisted of traditional gathering shellfish, growing seaweed

eating fish in salt ponds, trapping fresh water shrimp and fish, netting school fish and hooking large predator fish. Turtles were also caught and eaten, as evidenced by deposits of turtle bones discovered in nearby Waiohuli lands (Kittinger et al).

Subsistence fishing and seasonal fishing kapu kept fish populations stable and abundant. Throw net fishing was a late method that increased the amount of fish a single fisher could collect each day (Handy & Pukui, 511).

Intermittant Habitation

It is probable that the Waiohuli area had habitation sites where fishpond stewards stayed to carry out their kuleana. Uplanders would have visited beach areas to fish, trade, travel by sea to other communities or islands, or enjoy the sport of surfing on boards or in outrigger canoes.

Waiohuli Ahupua'a Crown Land

At the Mahele, Waiohuli and eight other ahupua'a on other islands were never recorded by King Kamehameha III. Forty years later in 1890, King David Kalākaua and The Kingdom of Hawai'i Legislature formally assigned these nine previously unaccounted ahupua'a to the Crown by "An Act to declare certain lands to be part of the Crown Lands and Royal Domain." (Laws of His Majesty Kalakaua, 158). Historical researchers presume no claims were made for these lands because they were sparsely populated.

It is true that there was no population center in Waiohuli until homestead lots were created in the beach area and mauka lands above 2,000 feet elevation in the early 1900s (Campbell). However, all nine "overlooked" ahupua'a referred to in this act had one thing in common: water resources such as springs, streams and fisheries, traditionally held by Ali'inui or Kings. Kalākaua's act simply formalized a generational kuleana of high chiefs for these prized lands.

Crown Lands converted to Homesteads

Later, in the early 1900s Waiohuli grants and homesteads were issued to individuals Ten Kui Chong and David M. Thompson for portions of the Property (Registered HI Survey Map 2516.) Land Grant 10115 to Ten Kui Chong accounts for TMK 3-9-008:016 portion of the Property, and Land Grant 10043 to David M. Thompson underlies TMKs 3-9-007: 38, 39 and 40, referenced in Maui County zoning ordinances 2313 (Bill 22)

WWII Military Land Use

During World War II after the battle of Kwajalein in 1944, the Department of the Navy established a top-secret Naval Combat Demolition Training Center at Waiohuli Beach and Experimental Base on the Beach at Kama'ole. (Fane) This Underwater Demolition Training Unit would later become the Navy Seals. The entire leeward coast from Mā'alaea to Makena was used to train troops in amphibious landings (NOAA).

Place Names Associated With This Area

The Hawaiian culture places a particular importance on place-names. Throughout Polynesia, cultures are for the most part ocean-based, surviving and building their cultures around the bounty of the sea. While Hawaiians share common history with all Pacific peoples, because of the unique factors of these high-islands, their culture turned decidedly more land-oriented than many other Pacific cultures. The abundant access to fresh water sources, fertile soil, relative lack of reef and reef fish compared to older south pacific islands all contributed to their formation of a completely unique and distinct culture; a culture that placed a high inherent value on land and landforms, landscapes and their relationship to people's lives. In place-names one can find its purpose, their purpose, and the hidden *kaona* (symbolism) behind the word.

Ka'ono'ulu

The ahupua'a adjacent and to the north of the Property is named for the breadfruit grown on its upper slopes in the cooler mauka region on Haleakala. This breadfruit would have been carried down to the coastline and traded for fish and other products.

Waiakoa

The ahupua'a adjacent and to the north of the Property, it is named for the Koa tree that grew on the upper slopes of that ahupua'a.

Waiohuli

The Property resides in the ahupua'a of Waiohuli. It is named for the clouds that come down the slopes of Haleakala and let loose their rain before retreating again to the mauka regions.

Kalepolepo

The small coastal region north of the Property that houses the fishpond of Ko'ie'ie, so called for the dirty (lepo) waters in the area during times of rain.

Ko'ie'ie

The name of the major ancient fishpond in the Ka'ono'ulu ahupua'a, that along with others supplied a variety of food to the residents. See the following sections for more detailed information on the history of Ko'ie'ie.

Kaipukaiohina

A section of beach named for the bounty of its waters, *Ka ipu kai o Hina* is the Ocean-basket of Hina.

Kihe

The contemporary name for the entire coastal area of Kula, Kihei literally means a cape or shawl as is interpreted as representing the cloak of dust spread over the area by fierce trade winds and/or the cloak of the clouds created by Haleakala that stretch out into the channel sometimes connecting to Kaho'olawe and Lana'i.

Traditional Hawaiian Uses & Practices

The inhabitants of the coastal areas of Waiohuli sustained themselves through the bounty of the ocean. Nearby to them was the fishpond of Kalepolepo, commonly called Ko'ie'ie. Kalepolepo was built by an early Maui chief and by the 16th century King Umi of Hawai'i Island tasked the commoners with rebuilding the walls. Later, during the reign of Kamehameha I he rebuilt Kalepolepo again, tasking all the people of the west side of Maui to work. Ke Alaloa o Maui, the broad highway of Maui constructed by King Pi'ilani crosses through the ahupua'a of Waiohuli on its way to Mākena and not much is mentioned of this area besides Kalepolepo pond and the dryness of the area.

Post-Contact Historical Uses & Practices

It was near Kalepolepo and the shoreline north of the Property that Kamehameha is said to have landed his canoes for his invasion of Maui. Kamehameha had previously been beaten by the forces of Maui because of their furious use of the ma'a (sling) for which Maui's warriors were famous. But Kamehameha this time had the foreign technology of mortars, muskets, and cannons. It was here he uttered the now famous saying, "Imua e nā poki'i. He inu i ka wai 'awa'awa", forward my brothers or drink of the bitter waters. He set fire to his canoes, their only form of retreat and challenged his men to win the battle or drink the bitter water of defeat and certain death. From Kalepolepo the army of Kamehameha pushed the warriors of Maui back to the West Maui Mountains.

With the arrival of the foreigners came the foreign interest of making money and one of the first goods to be mass exported from the islands was the Sandalwood. Ili'ahi in Hawaiian, the sandalwood tree has a fragrance highly prized by the Chinese and entire forests were denuded in the rush to make foreign money. Many of these forests were in the upper part of the Kula moku and the deforestation of these forests was a contributor to the siltation of the brackish ponds and loko i'a (fishponds).

While the rest of the island was undergoing a radical transformation of landscape with the construction of large sugar and pineapple plantations, the Kihei area remained largely unchanged due to the lack of water. No foreign investors wanted to stake a claim to land out there knowing there was no way to water their crops. For a long time, Kihei remained the same, a few hundred Hawaiian families living off the bounty of the ocean.

In 1828 the first Catholic priest to the Hawaiian Islands, Father Bachelot, brought with him from Paris a seed which he grew into a tree and planted in a church in Honolulu. Soon after the seeds of this tree were taken to all the islands and began to dominate the leeward landscape of Maui. Kiawe soon was the most prolific tree in South Maui, so much so, that the kupuna (elders) of today remember Kihei as being covered in kiawe. There was so much kiawe that they would make slippers out of old car tires, the only thing that would stop the kiawe thorn from puncturing their feet. Oral accounts detailed how they would take the rubber tires off their bikes and replace it with a garden hose, wrapped multiple times and bound with wire, after getting too many flats with a regular tube tire.

Current Uses, Practices, & Resources of the Property

The Property is located within 200 yards inland from the beach in Kihei. In the Hawaiian Kingdom and earlier, Waiohuli and Kēōkea ahupua'a were in the moku of Kula. Records back to the early 1900s connect Waiohuli and the adjacent ahupua'a of Kēōkea, Crown land assigned to Queen Kamāmalu in the Mahele Book. These very similar sections were connected culturally and socially from early times. People of old also connected Waiohuli to Kama'ole ahupua'a, all part of Kula Moku (Ka Nūpepa Kū'oko'a) Wailuku heiau of Kama'ole was probably the regional luakini for this area.

Currently a portion of the Property is used as an open air craft or tourist market. The corner-most portion of the Property is one of the last remaining vacant lots on South Kihei Road. There are no cultural practices or resources on the Property. The closest cultural resource of significance is the Ko'ie'ie fishpond and the other fishponds along the coast which are undergoing a revitalization effort to bring them back to their former glory and provide educational opportunities for the community.

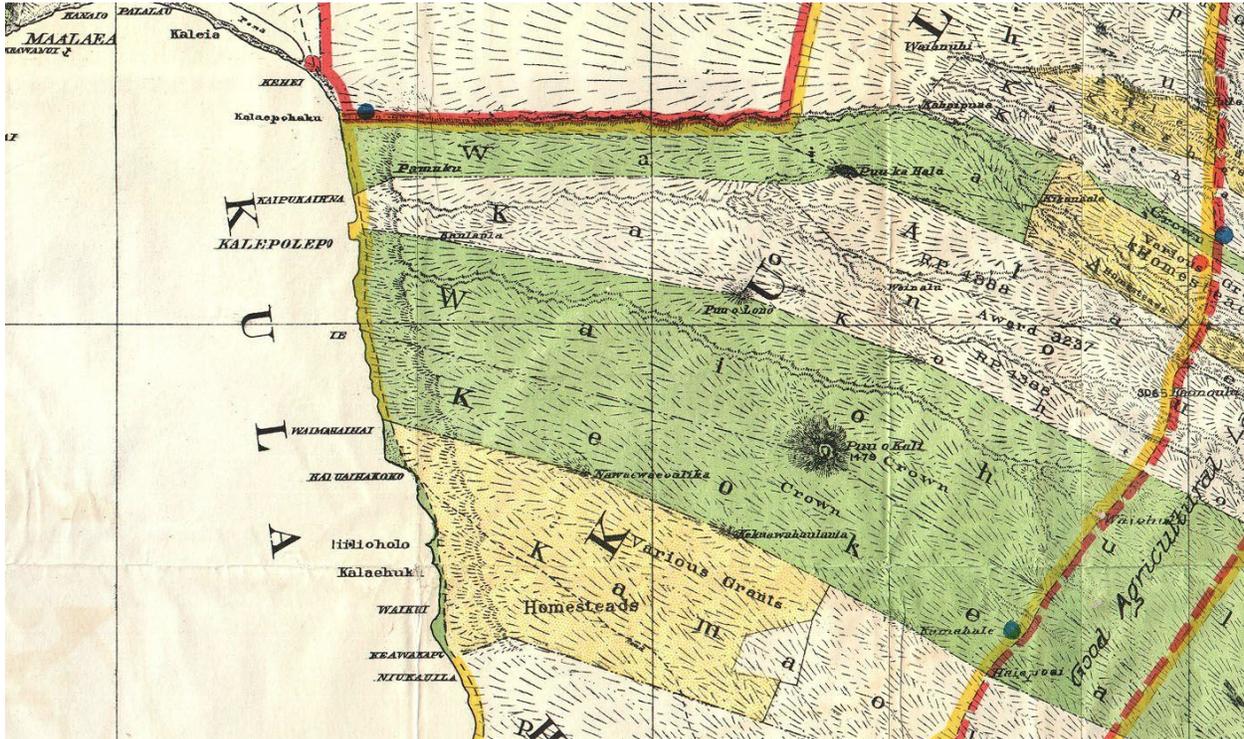


Figure 2: Waiohuli Section of Alexander Map

Summary of Interviews

Paula Kalanikau

Paula was interviewed by phone in early December of 2014. Paula married into the Kalanikau 'ohana, the family who owned the ahupua'a of Kaonoulu. She stated that there were three families involved in the ownership prior to the Great Mahele: the Waiwaiole's and the Kalanikauikealaleo's.

Paula Kalanikau moved to Kihei in the early 1960's. She reminisced that all of the people lived in the flood inundation zone and when the floods came from a Kona storm, people couldn't get in or get out. That was before Pi'ilani Highway. The old Suda Store at the beginning of South Kihei Road was the gateway to Kihei back in the 1960's and 1970's.

In 1972, Paula's husband worked with a group of neighborhood men to start the Kihei Canoe Club on Sugar Beach. All of the Sugar Beach hotels were already there by the time Kihei Canoe Club got that land from the County. The Kalanikau's were all active in the Kihei community.

Mrs. Kalanikau talked about the changes in Kihei and how a lot of the changes are for the worse. Her final comment sums up her feelings about the future of Kihei:

“Oh, I'm definitely interested in them having a High School here. I think the children deserve that; and a hospital. But we need to be also aware of what our ancestors have established in these areas and be mindful to developers what would be our priorities. And that is our priority: to look after our 'aina.”

When asked specifically about the Walgreen's project, she indicated disappointment. She feels there are enough stores in Kihei, especially on South Kihei Road. The development of the area has taken over and there isn't a lot left of the simpler life she remembers.

Paula and Minette Ngalu

Paula and Minette are both long-time residents of Kihei. Although each of them grew up further south of the Property, both recalled there being an abundant mango grove on the Property.

Roy K. Suda

Roy K. Suda moved to the Kihei area with his family when he was a young boy, he is now 72. Roy had two brothers and two sisters. They were among a handful of families who lived on Ke Ala street- behind present day Foodland. Ke Ala street was just a dirt road back then, so there were not many families in the area. He remembers that the Waiteka's (Mildred Akina, a long-time Kihei resident, married into the Waiteka family) and the Nishida's lived on the opposite side from them. Mr. Nishida was a policeman. He also remembers two other families—the Kasahara's and the Maeda's.

Other than those living on Ke Ala street, Kihei residents also included the Akina's and the Azeka's. Other than that, not many long-time Kihei residents remain in the area today. Roy talked about the original Azkea store being located where the Foodland is today. At that time it was called Tomokio's. Mr. Azkea worked for the Tomokio's until he took over the store in the 1960's and moved further north to what is now Azkea Plaza.

There were two stores in Kihei at that time: Azkea's and A&B Suda store. A&B Suda store opened in 1964, a few years after Azkea's moved to their new location. A&B Suda was the place to get gas in Kihei.

Roy spent his childhood riding bikes in the area and remembers going through the Property to access the ocean. They spent a lot of time gathering ogo (seaweed) from that area. He remembers the ogo was very plentiful when he was young. He also remembers people fishing from the shoreline—they would catch kumu, mei pachi (red big-eyed fish) and a lot of squid. People also caught white eel or tohei.

Synthesis of Archival, Literary, & Oral Accountings

The ahupua'a of Waiohuli carried a population in pre-contact times that survived on marine life, sweet potato, and ulu that was carried down from the upper slopes of Haleakala. Post-contact the area nearer the coast continued to support a variety of commerce and recreational activities centered around the fishponds until the siltation of the ocean area and breakdown of the fishpond walls made them unusable. The proposed Property has been unused for the past century with no cultural resources in the vicinity.

Potential Effects of Development & Proposed Recommendations

This report finds that the proposed Walgreens Retail store project located at TMK(s): (2)3-9-007:037; (2)3-9-007:038; (2)3-9-007:039; (2)3-9-007:040; (2)3-9-008:016 has no significant effects to cultural resources, beliefs, or practices. As always, all applicable county, state, and federal laws concerning discovery of burials or other cultural materials should be followed to the letter.

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APPENDIX **E**

Traffic Impact Analysis Report

Phillip Rowell and Associates

47-273 'D' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8206 FAX: (808) 239-4175 Email: prowell@hawaii.rr.com

March 27, 2015

Mr. Jeffrey A. Benner
c/o Tom Schnell
PBR Hawaii
1001 Bishop Street, Suit 600
Honolulu, HI 96813

Re: **Traffic Impact Assessment Report
Kihei Walgreens, Maui, Hawaii**

Dear Jeffrey:

Phillip Rowell and Associates have completed the following Traffic Impact Analysis Report (TIAR) for the proposed Walgreens in Kihei, Maui. The report is presented in the following format:

- A. Project Location and Description
- B. Purpose and Objective of Study
- C. Study Approach
- D. Description of Existing Roadways and Intersections
- E. Existing Peak Hour Traffic Volumes
- F. Public Transportation
- G. Level-of-Service Concept
- H. Existing (2014) Levels-of-Service
- I. Existing Deficiencies
- J. 2020 Background Traffic Projections
- K. Project Trip Generation
- L. Background Plus Project Projections
- M. Traffic Impact Assessment
- O. Mitigation
- P. Summary and Recommendations

A. Project Location and Description

The proposed action is the construction of a 14,550 square foot Walgreens Drug Superstore with a drive-thru window. Approximately 2,500 square feet will be used for ware housing/storage space. A schematic site plan is provided as [Attachment A](#). The site is currently occupied by an open air market type of retail. The market is not open during the morning peak hours.

Access to and egress from the site will be provided by two new driveways. The primary access will be provided by a new driveway along the west side of South Kihei Road, approximately midway between the McDonald's driveway and Nohokai Street. The intersection will be unsignalized and all traffic movements will be allowed.

The second driveway will be along the south side of Nohokai Street at the west end of the project site. All traffic movements will be allowed into this driveway; however, only right turns will be allowed out.

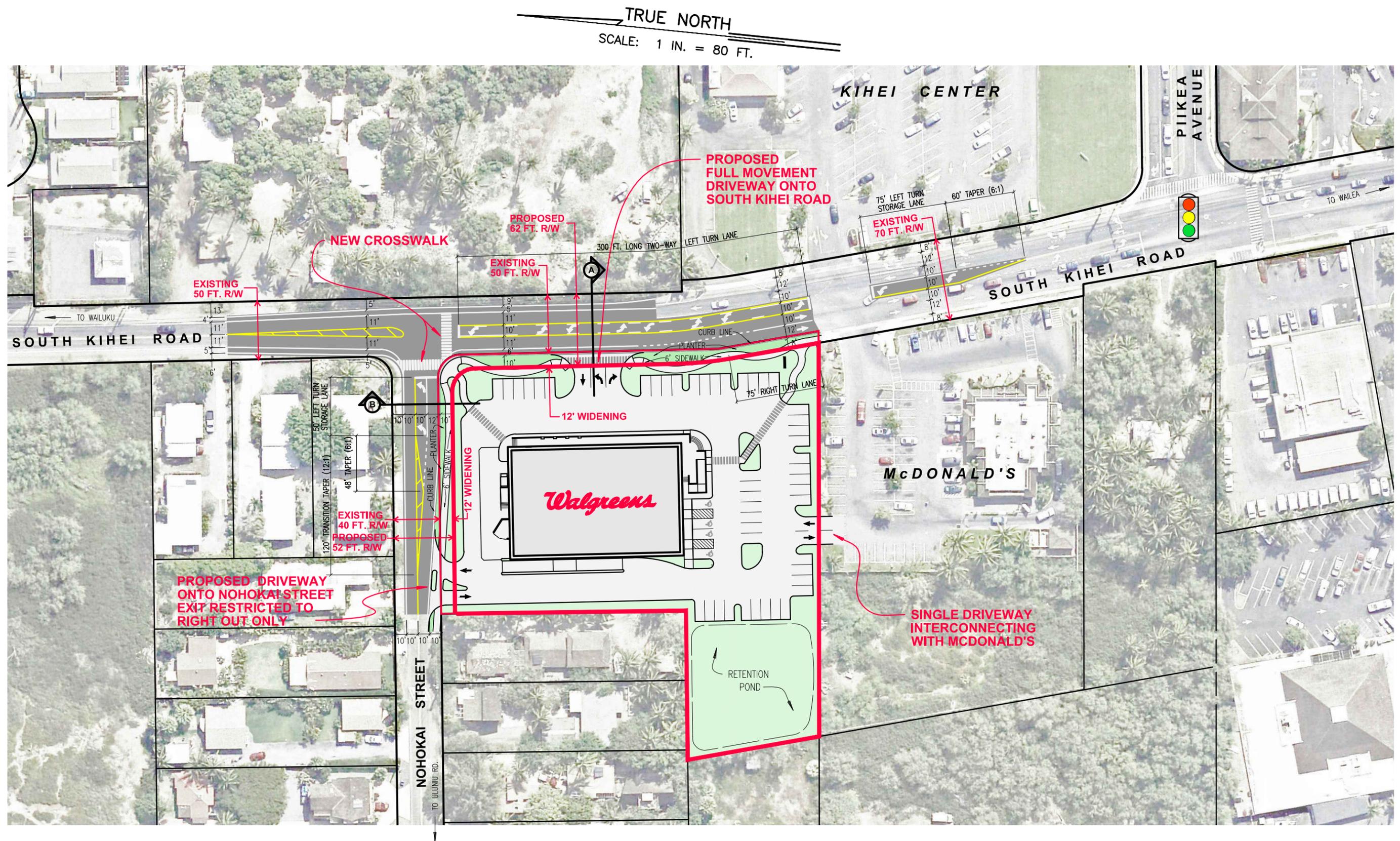
The project will include vehicle capacity and bicycle and pedestrian facility upgrades along South Kihei Road and Nohokai Street in front of the project (See Attachment A) in compliance with both

List of Attachments

- A. Project Site Plan and Roadway Typical Sections
- B. Existing Intersection Lane Configurations and Right-of-Way Controls
- C. Aerial Photographs of Study Intersections
- D. Existing (2014) AM Peak Hour Traffic Volumes
- E. Existing (2014) PM Peak Hour Traffic Volumes
- F. Level-of-Service Worksheets for Existing AM Peak Hour Traffic Volumes
- G. Level-of-Service Worksheets for Existing PM Peak Hour Traffic Volumes
- H. 2020 AM Background Peak Hour Traffic Projections Without Project Generated Traffic
- I. 2020 PM Background Peak Hour Traffic Projections Without Project Generated Traffic
- J. Level-of-Service Worksheets for 2020 AM Background Traffic Projections without Project Generated Traffic
- K. Level-of-Service Worksheets for 2020 PM Background Traffic Projections without Project Generated Traffic
- L. Project Trip Assignments - AM Peak Hour
- M. Project Trip Assignments - PM Peak Hour
- N. 2020 AM Background Plus Project Peak Hour Traffic Projections
- O. 2020 PM Background Plus Project Peak Hour Traffic Projections
- P. 2020 Lane Configurations and Lane Configurations With Project
- Q. Level-of-Service Worksheets for 2020 AM Background Plus Project Traffic Projections
- R. Level-of-Service Worksheets for 2020 PM Background Plus Project Traffic Projections

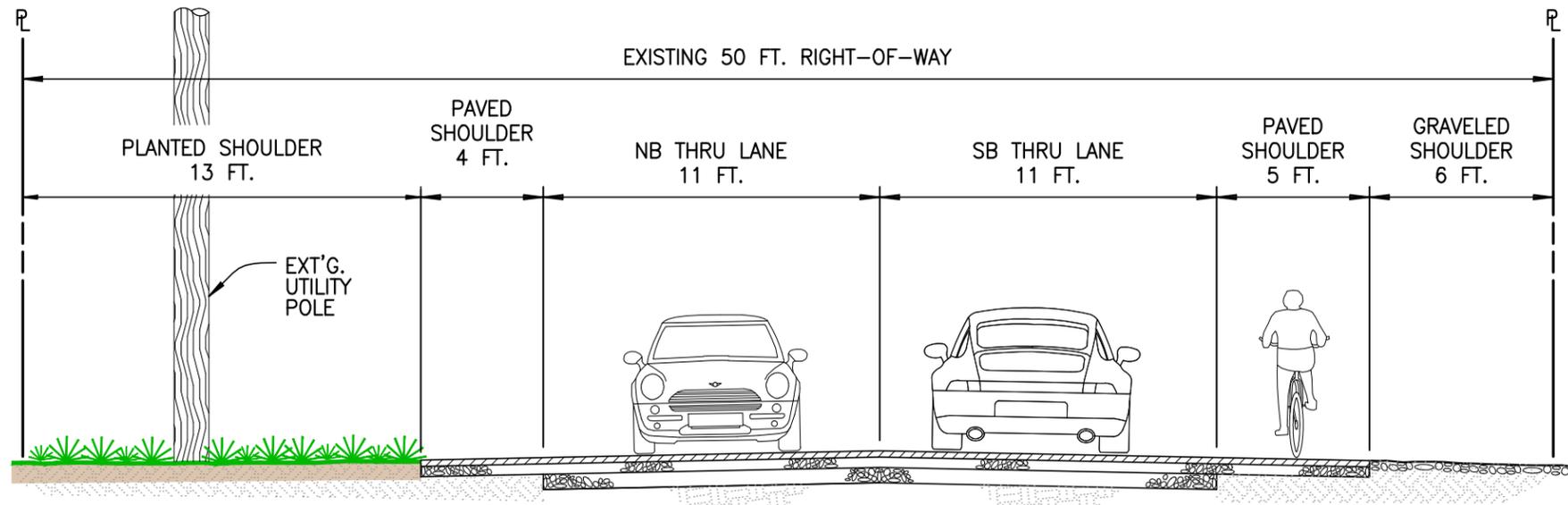
Attachment A
Project Site Plan and Roadway Typical Sections

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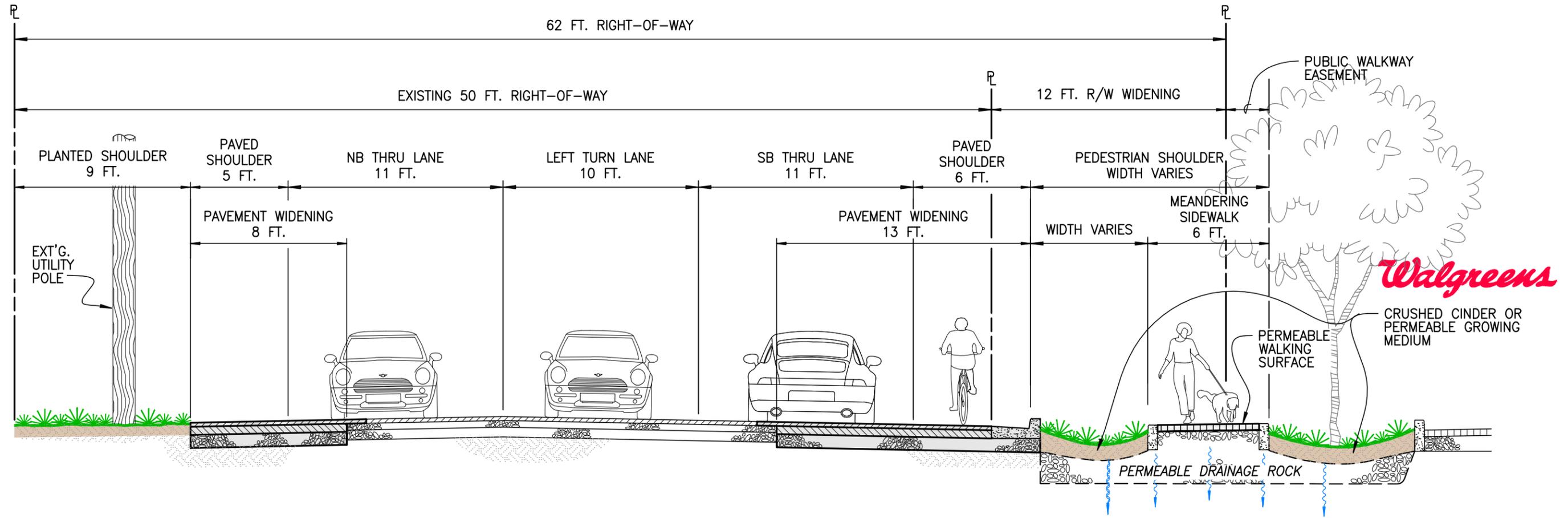


NOTE:
PROPOSED STREET SECTIONS ARE SHOWN
ON FIGURES 2-2a AND 2-2b.

FIGURE 2-1
Right-of-Way Widening and
Street Frontage Improvements



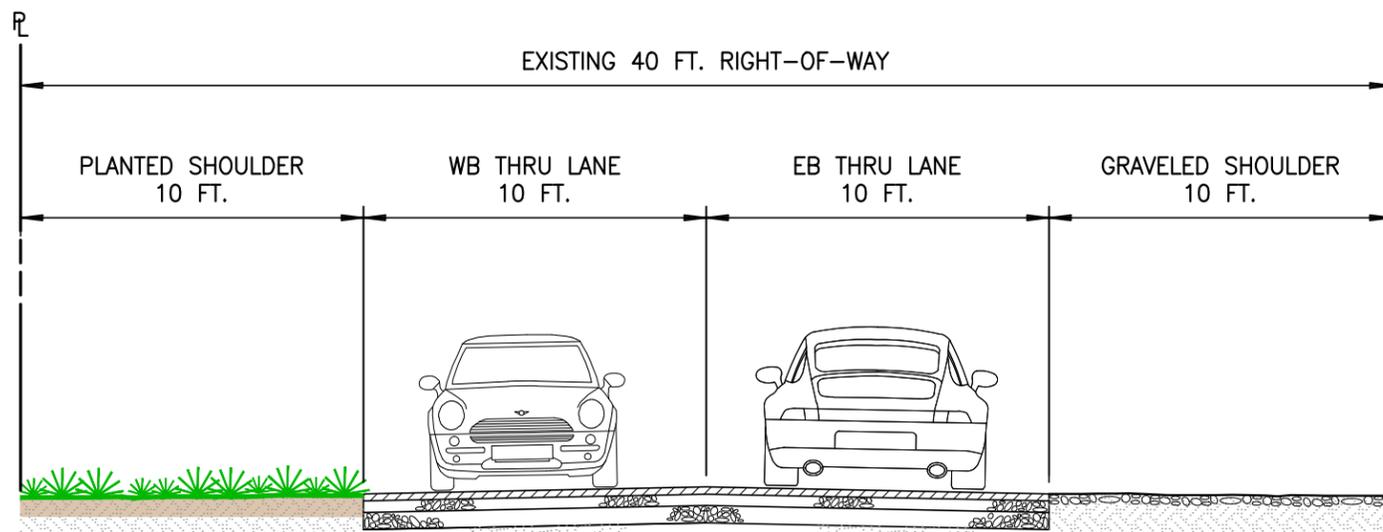
EXISTING SOUTH KIHAI ROAD SECTION



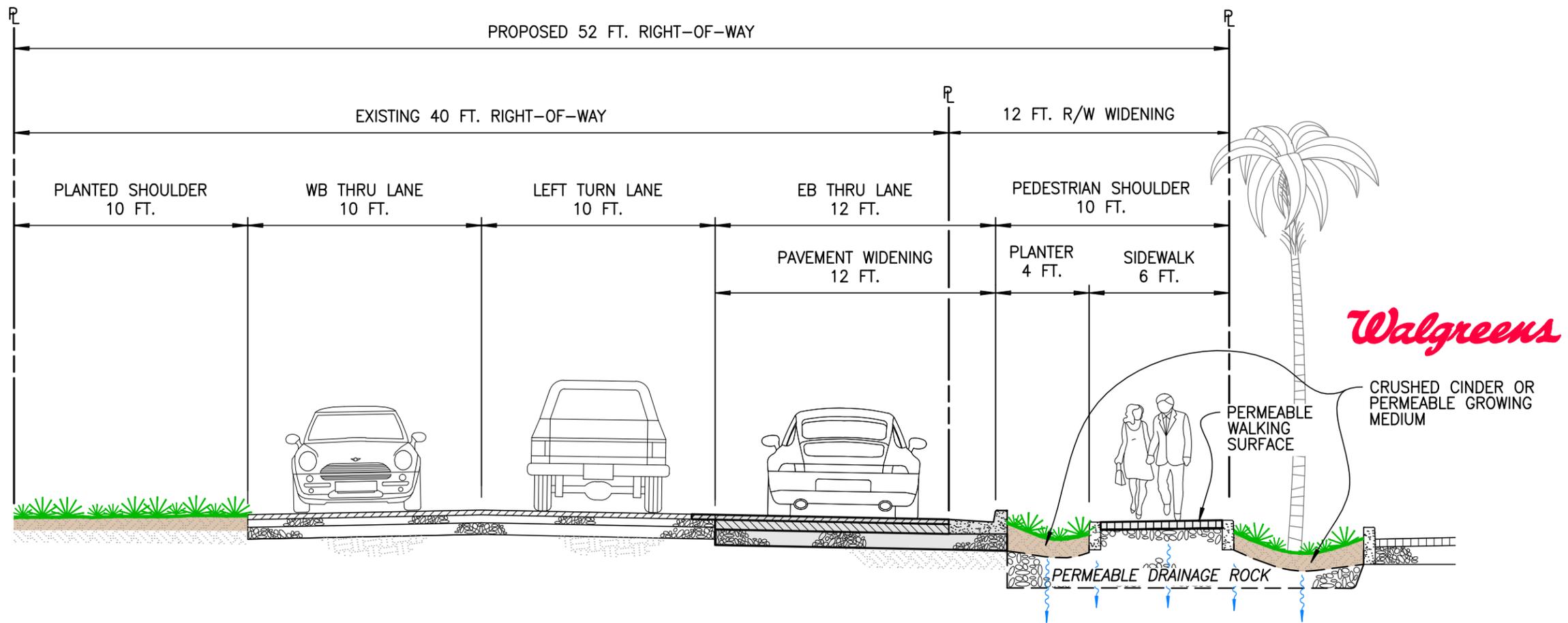
PROPOSED SOUTH KIHAI ROAD SECTION

FIGURE 2-2a
South Kihei Road Cross Sections

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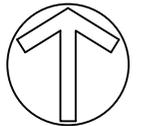


EXISTING NOHOKAI STREET SECTION

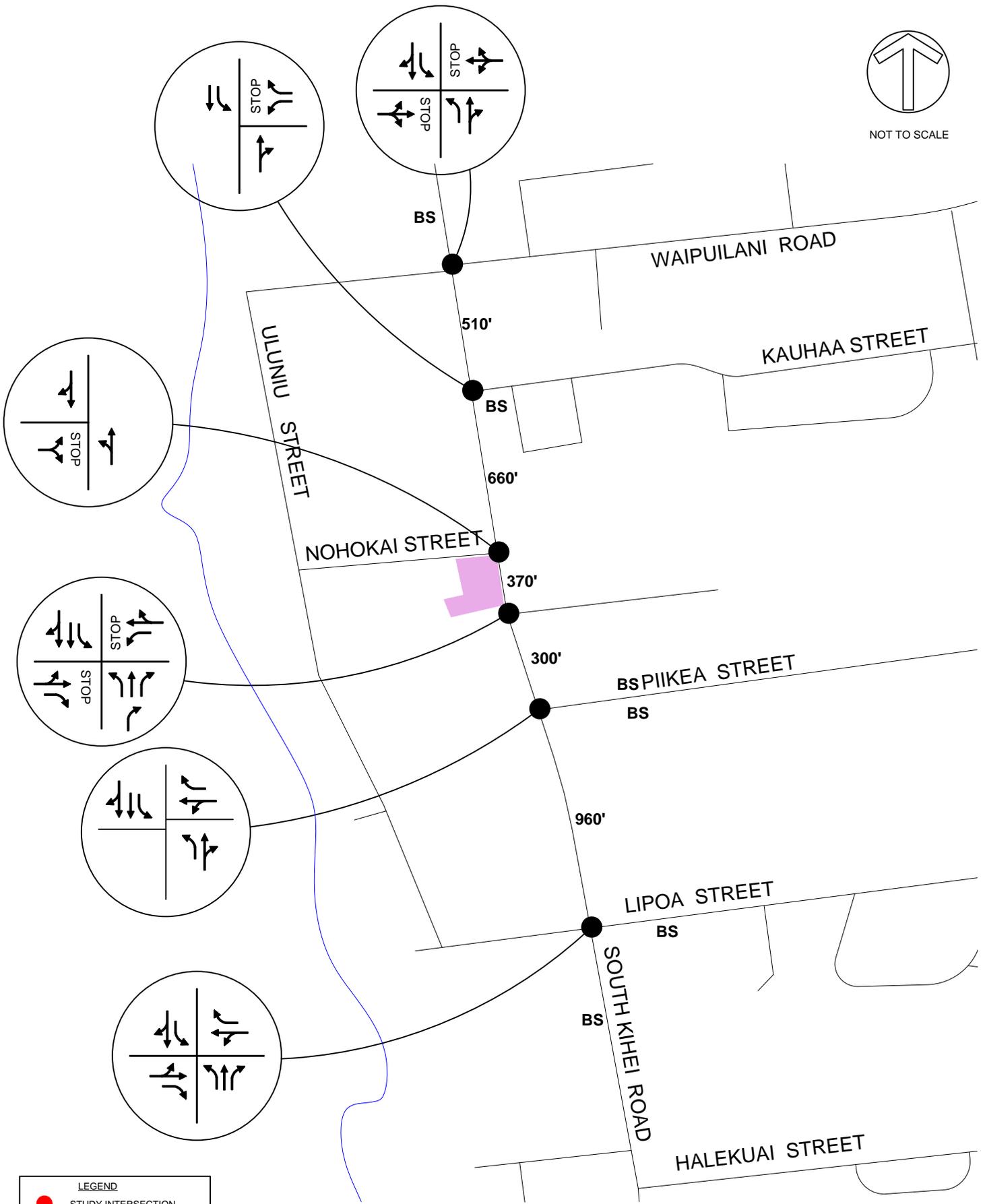


PROPOSED NOHOKAI STREET SECTION

FIGURE 2-2b
Nohokai Street Cross Sections



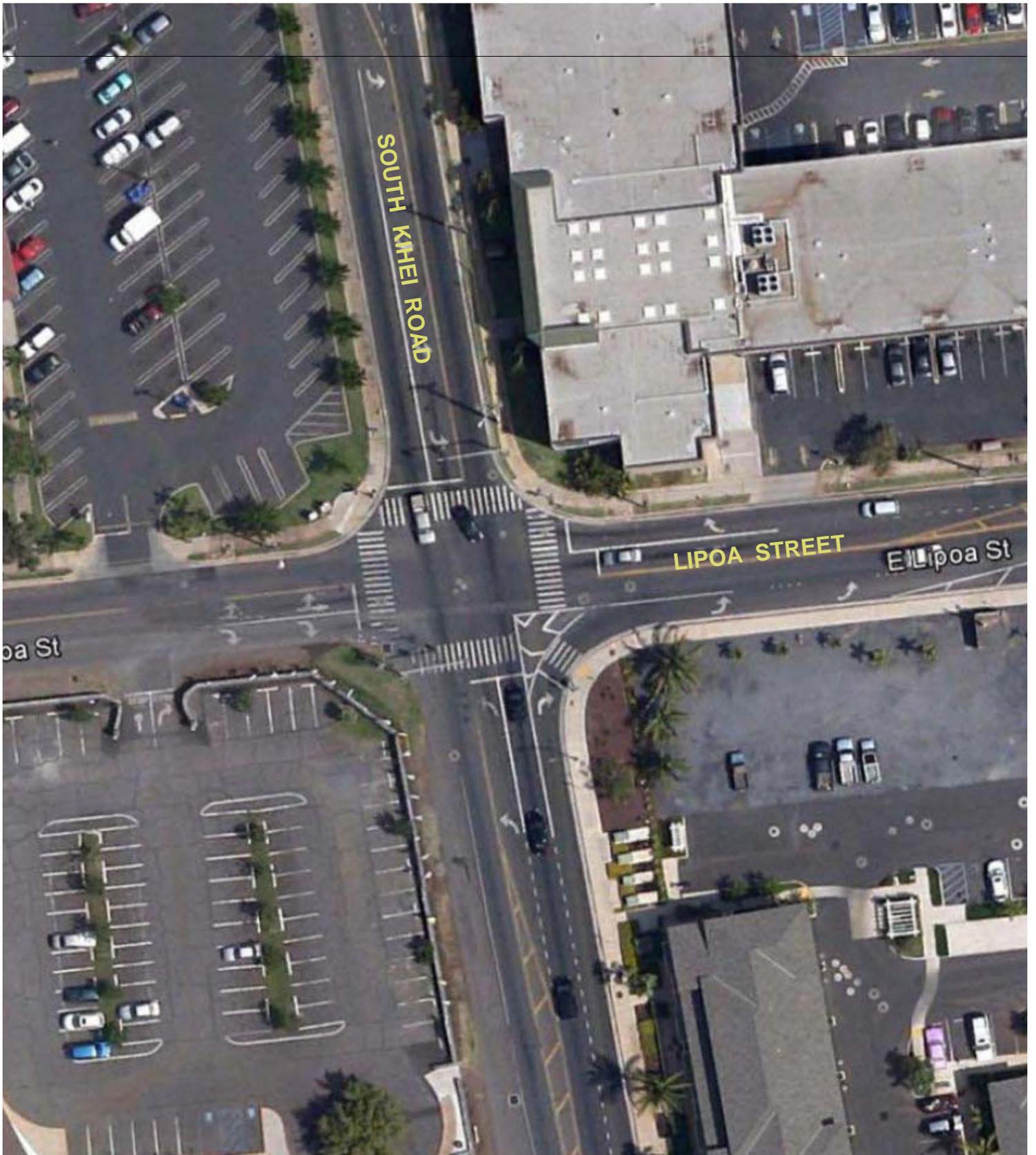
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LEGEND	
	STUDY INTERSECTION
	PROJECT
BS	BUS STOP

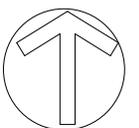
Attachment B
EXISTING (2014) LANE CONFIGURATIONS AND
RIGHT-OF-WAY CONTROLS

Attachment C
Aerial Photographs of Study Intersections



Source: Google Earth

Attachment C1
AERIAL PHOTOGRAPH
INTERSECTION OF SOUTH KIHAI ROAD AT LIPOA STREET

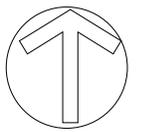


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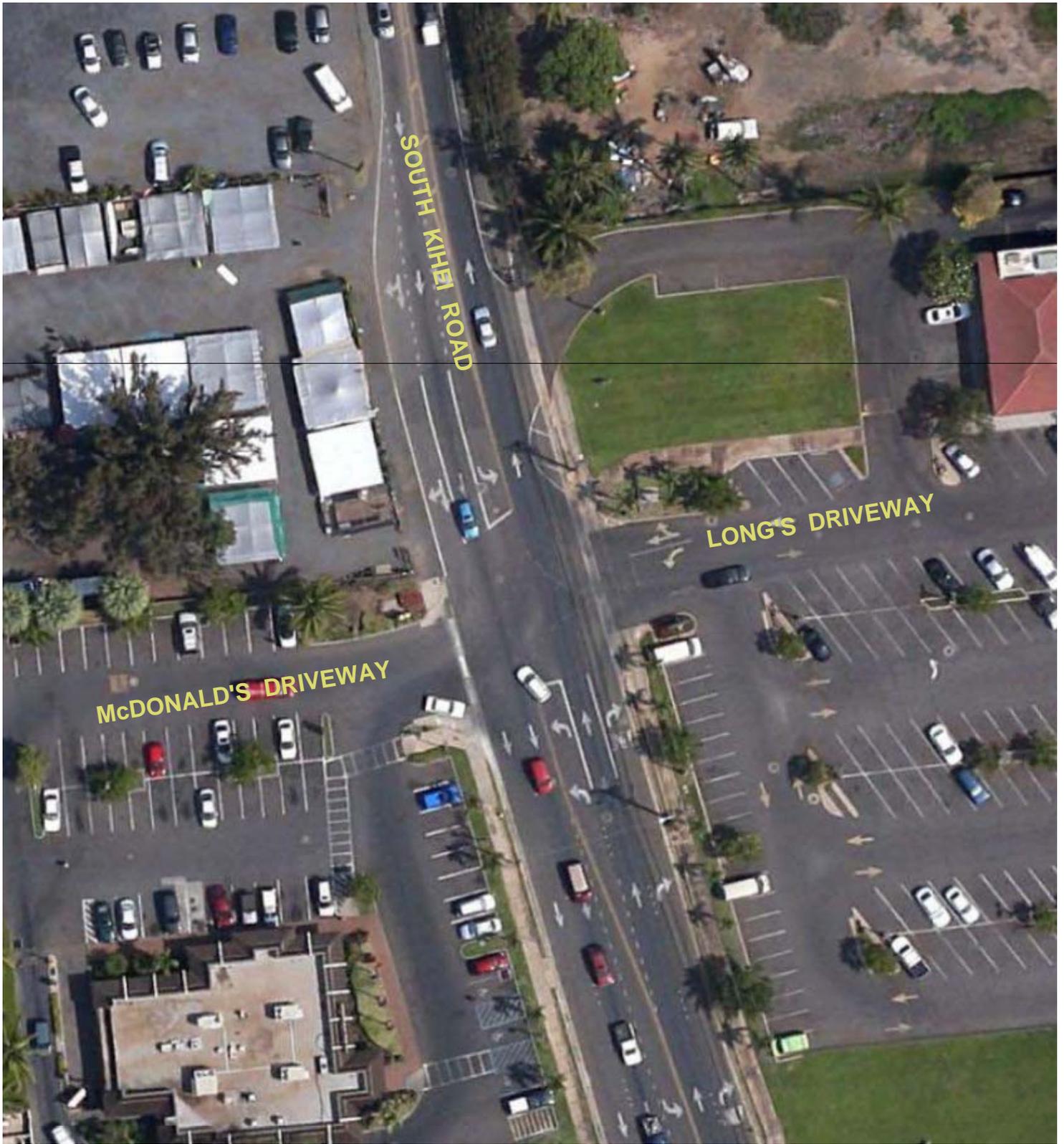


Source: Google Earth

Attachment C2
AERIAL PHOTOGRAPH
INTERSECTION OF SOUTH KIHAI ROAD AT PIIKEA AVENUE

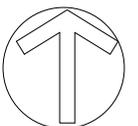


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Source: Google Earth

Attachment C3
AERIAL PHOTOGRAPH
INTERSECTION OF SOUTH KIHAI ROAD AT McDONALD'S/LONGS DRIVEWAY

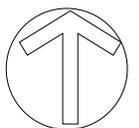


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Source: Google Earth

Attachment C4
AERIAL PHOTOGRAPH
INTERSECTION OF SOUTH KIHAI ROAD AT NOHOKAI STREET

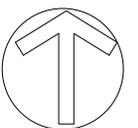


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Source: Google Earth

Attachment C5
AERIAL PHOTOGRAPH
INTERSECTION OF SOUTH KIHAI ROAD AT KAUHAA STREET

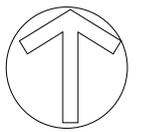


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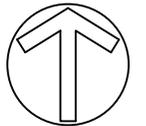


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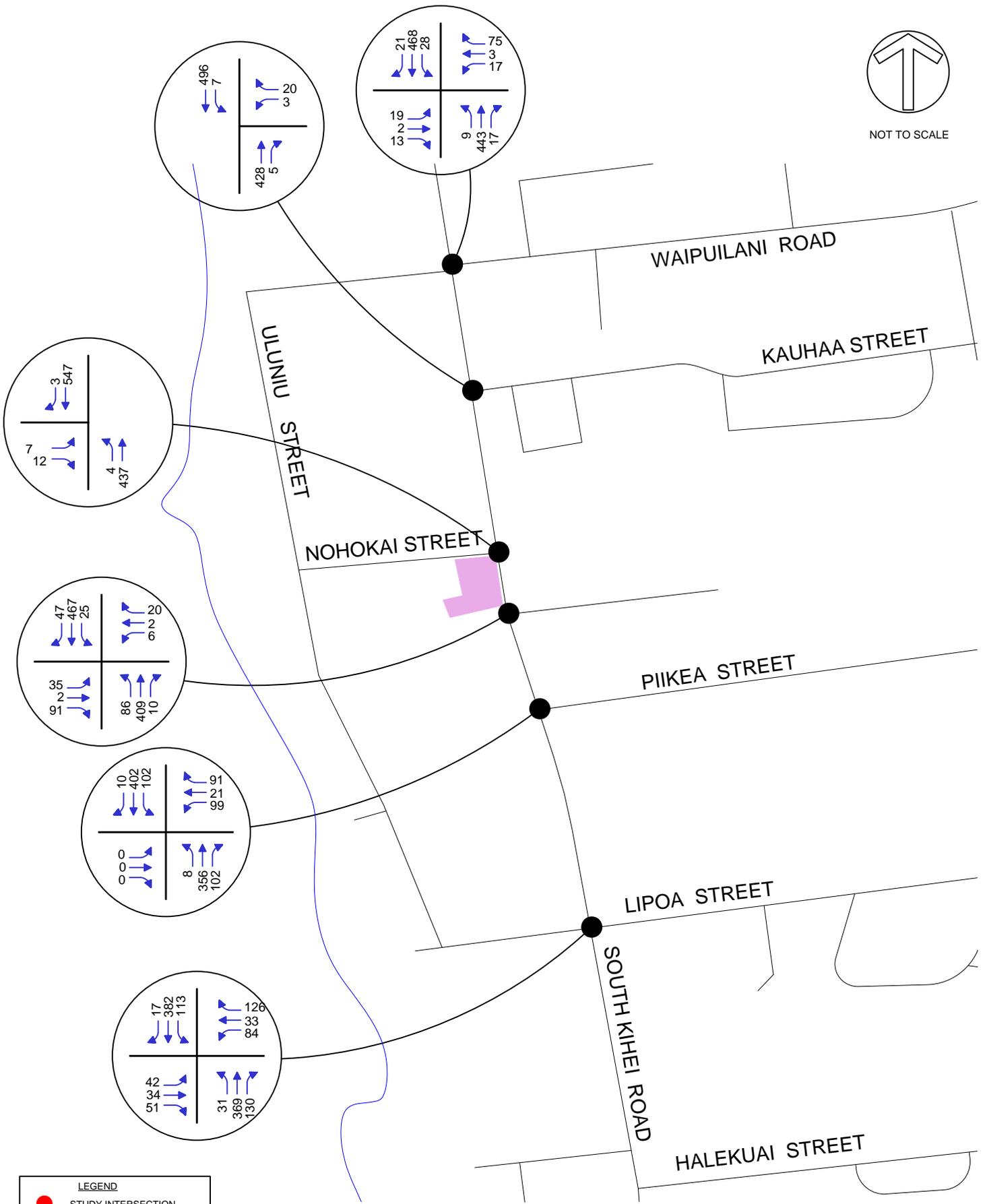
Attachment C6
AERIAL PHOTOGRAPH
INTERSECTION OF SOUTH KIHEI ROAD AT WAIPUILANI ROAD



NOT TO SCALE

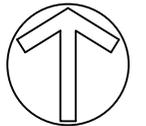


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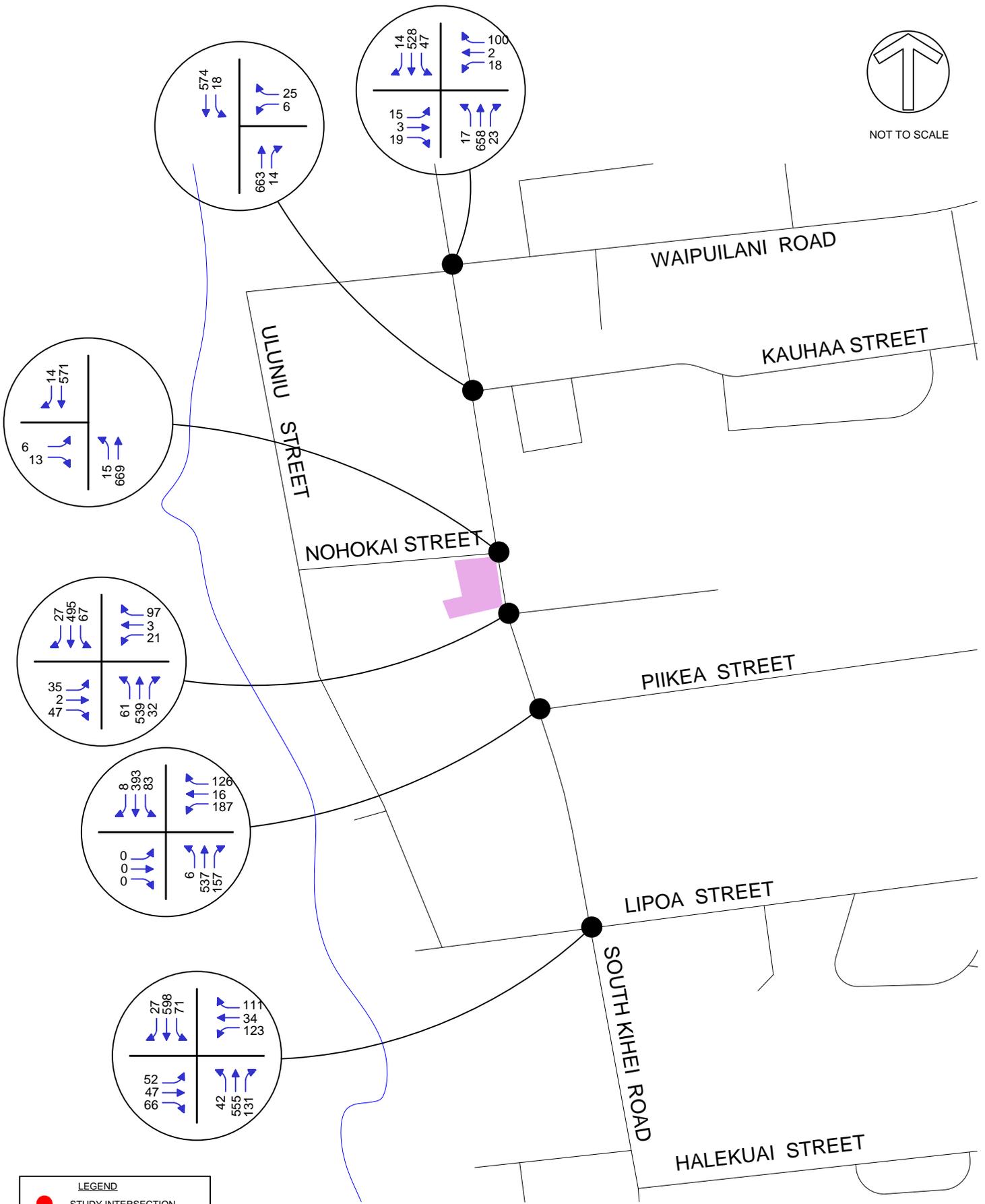


LEGEND	
	STUDY INTERSECTION
	PROJECT

Attachment D
EXISTING (2014) AM PEAK HOUR TRAFFIC VOLUMES



NOT TO SCALE



LEGEND

- STUDY INTERSECTION
- PROJECT

Attachment E
EXISTING (2014) PM PEAK HOUR TRAFFIC VOLUMES

Attachment F
Level-of-Service Worksheets for Existing AM Peak Hour
Conditions

HCM Signalized Intersection Capacity Analysis
 1: LIPOA STREET & S. KIHEI ROAD

12/5/2014

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1813	1583		1798	1583	1770	1863	1583	1770	1851		
Flt Permitted		0.77	1.00		0.74	1.00	0.51	1.00	1.00	0.42	1.00		
Satd. Flow (perm)		1440	1583		1370	1583	951	1863	1583	778	1851		
Volume (vph)	42	34	51	84	33	126	31	369	130	113	382	17	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	46	37	55	91	36	137	34	401	141	123	415	18	
RTOR Reduction (vph)	0	0	46	0	0	115	0	0	64	0	2	0	
Lane Group Flow (vph)	0	83	9	0	127	22	34	401	77	123	431	0	
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt			
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4		4	8		8	2		2	6			
Actuated Green, G (s)		9.5	9.5		9.5	9.5	35.2	33.2	33.2	42.8	37.0		
Effective Green, g (s)		9.5	9.5		9.5	9.5	35.2	33.2	33.2	42.8	37.0		
Actuated g/C Ratio		0.16	0.16		0.16	0.16	0.58	0.55	0.55	0.71	0.61		
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		226	249		215	249	580	1022	869	645	1132		
v/s Ratio Prot							0.00	0.22		c0.02	c0.23		
v/s Ratio Perm		0.06	0.03		c0.09	0.09	0.03		0.09	0.12			
v/c Ratio		0.37	0.03		0.59	0.09	0.06	0.39	0.09	0.19	0.38		
Uniform Delay, d1		22.8	21.6		23.7	21.8	5.4	7.8	6.5	3.3	5.9		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		1.0	0.1		4.3	0.2	0.0	1.1	0.2	0.1	1.0		
Delay (s)		23.8	21.7		28.0	21.9	5.4	9.0	6.7	3.5	6.9		
Level of Service		C	C		C	C	A	A	A	A	A		
Approach Delay (s)		23.0			24.9			8.2			6.2		
Approach LOS		C			C			A			A		
Intersection Summary													
HCM Average Control Delay			11.7		HCM Level of Service					B			
HCM Volume to Capacity ratio			0.42										
Actuated Cycle Length (s)			60.5		Sum of lost time (s)					12.0			
Intersection Capacity Utilization			48.7%		ICU Level of Service					A			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2: PIIKEA STREET & S. KIHEI ROAD

12/5/2014

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor					1.00	1.00	1.00	1.00	1.00	1.00	0.95		
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00		
Flt Protected					0.96	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)					1789	1583	1770	1863	1583	1770	3526		
Flt Permitted					0.96	1.00	0.49	1.00	1.00	0.52	1.00		
Satd. Flow (perm)					1789	1583	918	1863	1583	971	3526		
Volume (vph)	0	0	0	99	21	91	8	356	102	102	402	10	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	108	23	99	9	387	111	111	437	11	
RTOR Reduction (vph)	0	0	0	0	0	83	0	0	33	0	1	0	
Lane Group Flow (vph)	0	0	0	0	131	16	9	387	78	111	447	0	
Turn Type				Split		Perm	Perm		Perm	Perm			
Protected Phases				8	8			2				6	
Permitted Phases						8	2		2	6			
Actuated Green, G (s)					9.9	9.9	42.6	42.6	42.6	42.6	42.6	42.6	
Effective Green, g (s)					9.9	9.9	42.6	42.6	42.6	42.6	42.6	42.6	
Actuated g/C Ratio					0.16	0.16	0.70	0.70	0.70	0.70	0.70	0.70	
Clearance Time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)					293	259	646	1312	1115	684	2483		
v/s Ratio Prot					c0.07			c0.21			0.13		
v/s Ratio Perm						0.06	0.01		0.07	0.11			
v/c Ratio					0.45	0.06	0.01	0.29	0.07	0.16	0.18		
Uniform Delay, d1					22.8	21.4	2.7	3.3	2.8	3.0	3.0		
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2					1.1	0.1	0.0	0.6	0.1	0.5	0.2		
Delay (s)					23.9	21.5	2.7	3.9	2.9	3.5	3.2		
Level of Service					C	C	A	A	A	A	A		
Approach Delay (s)		0.0			22.9			3.7			3.3		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM Average Control Delay			6.9		HCM Level of Service					A			
HCM Volume to Capacity ratio			0.32										
Actuated Cycle Length (s)			60.5		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			41.0%		ICU Level of Service					A			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
 3: LONG'S DRIVEWAY & S. KIHEI ROAD

12/5/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	2	91	6	2	20	86	409	10	25	467	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	2	99	7	2	22	93	445	11	27	508	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								310				
pX, platoon unblocked	0.96	0.96		0.96	0.96	0.96				0.96		
vC, conflicting volume	1242	1230	279	1040	1245	445	559			455		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1252	1240	279	1041	1255	421	559			432		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	64	99	86	95	98	96	91			97		
cM capacity (veh/h)	107	148	718	137	145	557	1008			1078		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	40	99	7	24	93	445	11	27	338	220		
Volume Left	38	0	7	0	93	0	0	27	0	0		
Volume Right	0	99	0	22	0	0	11	0	0	51		
cSH	109	718	137	443	1008	1700	1700	1078	1700	1700		
Volume to Capacity	0.37	0.14	0.05	0.05	0.09	0.26	0.01	0.03	0.20	0.13		
Queue Length 95th (ft)	38	12	4	4	8	0	0	2	0	0		
Control Delay (s)	56.4	10.8	32.5	13.6	8.9	0.0	0.0	8.4	0.0	0.0		
Lane LOS	F	B	D	B	A			A				
Approach Delay (s)	24.0		17.7		1.5			0.4				
Approach LOS	C		C									
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			43.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: NOHOKAI STREET & S. KIHEI ROAD

12/5/2014

Movement	 EBL	 EBR	 NBL	 NBT	 SBT	 SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	12	4	437	547	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	13	4	475	595	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				681		
pX, platoon unblocked						
vC, conflicting volume	1080	596	598			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1080	596	598			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	97	100			
cM capacity (veh/h)	240	503	979			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	21	479	598			
Volume Left	8	4	0			
Volume Right	13	0	3			
cSH	359	979	1700			
Volume to Capacity	0.06	0.00	0.35			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	15.6	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.6	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			39.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: KAUHAA STREET & S. KIHEI ROAD

12/5/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	3	20	428	5	7	496
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	22	465	5	8	539
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1022	468			471	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1022	468			471	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			99	
cM capacity (veh/h)	260	595			1091	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	3	22	471	8	539	
Volume Left	3	0	0	8	0	
Volume Right	0	22	5	0	0	
cSH	260	595	1700	1091	1700	
Volume to Capacity	0.01	0.04	0.28	0.01	0.32	
Queue Length 95th (ft)	1	3	0	1	0	
Control Delay (s)	19.0	11.3	0.0	8.3	0.0	
Lane LOS	C	B		A		
Approach Delay (s)	12.3		0.0	0.1		
Approach LOS	B					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			36.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 6: WAIPUILANI ROAD & S. KIHEI ROAD

12/5/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	19	2	13	17	3	75	9	443	17	28	468	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	2	14	18	3	82	10	482	18	30	509	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1165	1101	520	1095	1103	491	532			500		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1165	1101	520	1095	1103	491	532			500		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	99	97	90	98	86	99			97		
cM capacity (veh/h)	141	204	556	179	203	578	1036			1064		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	37	103	10	500	30	532						
Volume Left	21	18	10	0	30	0						
Volume Right	14	82	0	18	0	23						
cSH	202	397	1036	1700	1064	1700						
Volume to Capacity	0.18	0.26	0.01	0.29	0.03	0.31						
Queue Length 95th (ft)	16	26	1	0	2	0						
Control Delay (s)	26.7	17.2	8.5	0.0	8.5	0.0						
Lane LOS	D	C	A		A							
Approach Delay (s)	26.7	17.2	0.2		0.5							
Approach LOS	D	C										
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			38.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Attachment G
Level-of-Service Worksheets for Existing PM Peak Hour
Conditions

HCM Signalized Intersection Capacity Analysis

1: LIPOA STREET & S. KIHEI ROAD

12/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1815	1583		1793	1583	1770	1863	1583	1770	1851	
Flt Permitted		0.77	1.00		0.70	1.00	0.28	1.00	1.00	0.31	1.00	
Satd. Flow (perm)		1439	1583		1307	1583	514	1863	1583	572	1851	
Volume (vph)	52	47	66	123	34	111	42	555	131	71	598	27
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	51	72	134	37	121	46	603	142	77	650	29
RTOR Reduction (vph)	0	0	57	0	0	96	0	0	63	0	2	0
Lane Group Flow (vph)	0	108	15	0	171	25	46	603	79	77	677	0
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)		12.2	12.2		12.2	12.2	35.2	33.6	33.6	36.8	34.4	
Effective Green, g (s)		12.2	12.2		12.2	12.2	35.2	33.6	33.6	36.8	34.4	
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.58	0.56	0.56	0.61	0.57	
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		292	321		265	321	334	1040	884	397	1058	
v/s Ratio Prot							0.00	0.32		c0.01	c0.37	
v/s Ratio Perm		0.08	0.05		c0.13	0.08	0.08		0.09	0.11		
v/c Ratio		0.37	0.05		0.65	0.08	0.14	0.58	0.09	0.19	0.64	
Uniform Delay, d1		20.7	19.3		22.0	19.4	6.4	8.7	6.2	5.7	8.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8	0.1		5.3	0.1	0.2	2.4	0.2	0.2	3.0	
Delay (s)		21.5	19.4		27.3	19.5	6.6	11.0	6.4	5.9	11.7	
Level of Service		C	B		C	B	A	B	A	A	B	
Approach Delay (s)		20.6			24.1			9.9			11.1	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM Average Control Delay			13.4		HCM Level of Service					B		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			60.2		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			61.7%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2: PIIKEA STREET & S. KIHEI ROAD

12/10/2014

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor					1.00	1.00	1.00	1.00	1.00	1.00	0.95		
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00		
Flt Protected					0.96	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)					1781	1583	1770	1863	1583	1770	3528		
Flt Permitted					0.96	1.00	0.50	1.00	1.00	0.37	1.00		
Satd. Flow (perm)					1781	1583	929	1863	1583	695	3528		
Volume (vph)	0	0	0	187	16	126	6	537	157	83	393	8	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	203	17	137	7	584	171	90	427	9	
RTOR Reduction (vph)	0	0	0	0	0	107	0	0	62	0	2	0	
Lane Group Flow (vph)	0	0	0	0	220	30	7	584	109	90	434	0	
Turn Type				Split		Perm	Perm		Perm	Perm			
Protected Phases				8	8			2				6	
Permitted Phases						8	2		2	6			
Actuated Green, G (s)					12.0	12.0	35.1	35.1	35.1	35.1	35.1	35.1	
Effective Green, g (s)					12.0	12.0	35.1	35.1	35.1	35.1	35.1	35.1	
Actuated g/C Ratio					0.22	0.22	0.64	0.64	0.64	0.64	0.64	0.64	
Clearance Time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)					388	345	592	1187	1008	443	2247		
v/s Ratio Prot					c0.12			c0.31			0.12		
v/s Ratio Perm						0.09	0.01		0.11	0.13			
v/c Ratio					0.57	0.09	0.01	0.49	0.11	0.20	0.19		
Uniform Delay, d1					19.2	17.2	3.7	5.3	3.9	4.2	4.1		
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2					1.9	0.1	0.0	1.5	0.2	1.0	0.2		
Delay (s)					21.1	17.3	3.7	6.7	4.1	5.2	4.3		
Level of Service					C	B	A	A	A	A	A		
Approach Delay (s)		0.0			19.7			6.1			4.5		
Approach LOS		A			B			A			A		
Intersection Summary													
HCM Average Control Delay			8.5		HCM Level of Service					A			
HCM Volume to Capacity ratio			0.51										
Actuated Cycle Length (s)			55.1		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			54.1%		ICU Level of Service					A			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
 3: LONG'S DRIVEWAY & S. KIHEI ROAD

12/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Volume (veh/h)	35	2	47	21	3	97	61	539	32	67	495	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	2	51	23	3	105	66	586	35	73	538	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								310				
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86				0.86		
vC, conflicting volume	1524	1452	284	1185	1432	586	567			621		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1611	1527	284	1216	1503	517	567			558		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	2	97	93	76	96	76	93			92		
cM capacity (veh/h)	39	85	713	95	88	431	1001			865		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	40	51	23	109	66	586	35	73	359	209		
Volume Left	38	0	23	0	66	0	0	73	0	0		
Volume Right	0	51	0	105	0	0	35	0	0	29		
cSH	40	713	95	386	1001	1700	1700	865	1700	1700		
Volume to Capacity	1.00	0.07	0.24	0.28	0.07	0.34	0.02	0.08	0.21	0.12		
Queue Length 95th (ft)	97	6	22	28	5	0	0	7	0	0		
Control Delay (s)	296.2	10.4	54.5	17.9	8.9	0.0	0.0	9.5	0.0	0.0		
Lane LOS	F	B	F	C	A			A				
Approach Delay (s)	136.3		24.3		0.9			1.1				
Approach LOS	F		C									
Intersection Summary												
Average Delay			10.9									
Intersection Capacity Utilization			50.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: NOHOKAI STREET & S. KIHEI ROAD

12/10/2014

Movement	 EBL	 EBR	 NBL	 NBT	 SBT	 SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	13	15	669	571	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	14	16	727	621	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				681		
pX, platoon unblocked	0.92					
vC, conflicting volume	1388	628	636			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1423	628	636			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	98			
cM capacity (veh/h)	135	483	948			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	21	743	636			
Volume Left	7	16	0			
Volume Right	14	0	15			
cSH	266	948	1700			
Volume to Capacity	0.08	0.02	0.37			
Queue Length 95th (ft)	6	1	0			
Control Delay (s)	19.6	0.5	0.0			
Lane LOS	C	A				
Approach Delay (s)	19.6	0.5	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		57.3%		ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: KAUHAA STREET & S. KIHEI ROAD

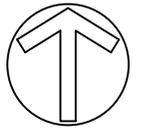
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	6	25	663	14	18	574
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	27	721	15	20	624
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1391	728			736	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1391	728			736	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	94			98	
cM capacity (veh/h)	153	423			870	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	7	27	736	20	624	
Volume Left	7	0	0	20	0	
Volume Right	0	27	15	0	0	
cSH	153	423	1700	870	1700	
Volume to Capacity	0.04	0.06	0.43	0.02	0.37	
Queue Length 95th (ft)	3	5	0	2	0	
Control Delay (s)	29.6	14.1	0.0	9.2	0.0	
Lane LOS	D	B		A		
Approach Delay (s)	17.1		0.0	0.3		
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.7%		ICU Level of Service	A
Analysis Period (min)			15			

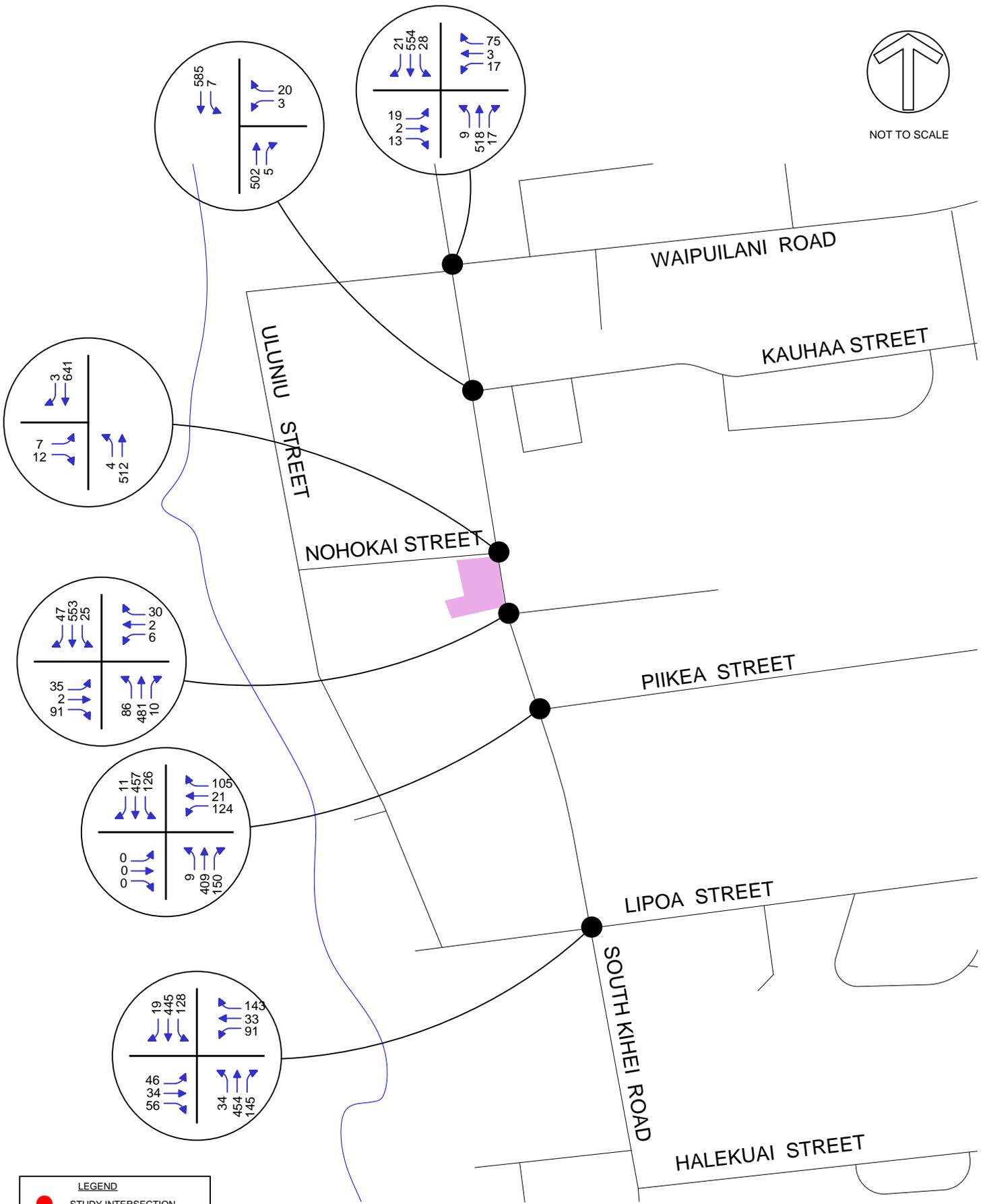
HCM Unsignalized Intersection Capacity Analysis
 6: WAIPUILANI ROAD & S. KIHEI ROAD

12/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	3	19	18	2	100	17	658	17	47	528	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	3	21	20	2	109	18	715	18	51	574	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1546	1454	582	1460	1453	724	589			734		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1546	1454	582	1460	1453	724	589			734		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	97	96	79	98	74	98			94		
cM capacity (veh/h)	65	120	513	95	120	425	986			871		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	40	130	18	734	51	589						
Volume Left	16	20	18	0	51	0						
Volume Right	21	109	0	18	0	15						
cSH	126	272	986	1700	871	1700						
Volume to Capacity	0.32	0.48	0.02	0.43	0.06	0.35						
Queue Length 95th (ft)	32	61	1	0	5	0						
Control Delay (s)	46.6	29.9	8.7	0.0	9.4	0.0						
Lane LOS	E	D	A		A							
Approach Delay (s)	46.6	29.9	0.2		0.7							
Approach LOS	E	D										
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			53.4%		ICU Level of Service					A		
Analysis Period (min)			15									



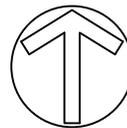
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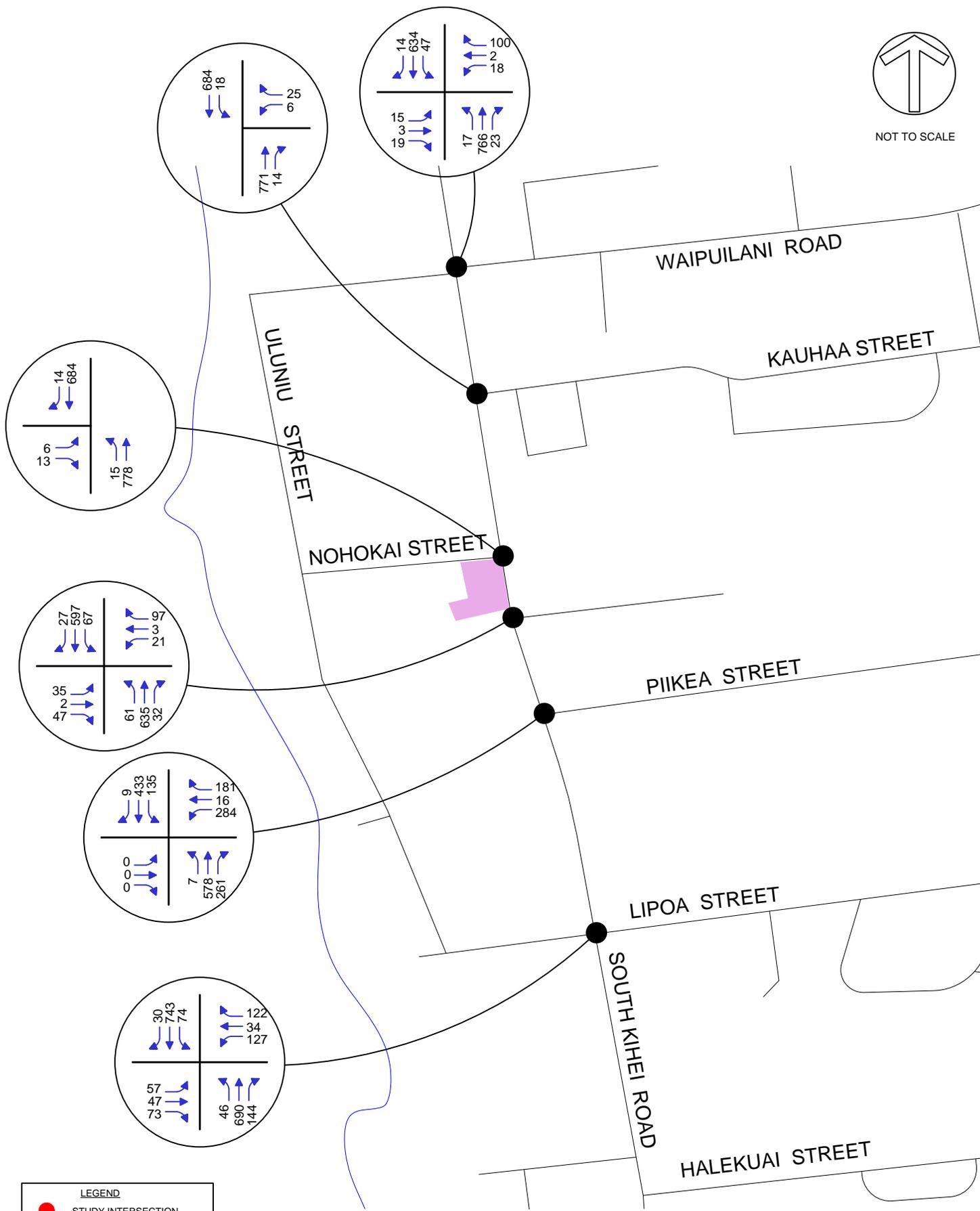
LEGEND

- STUDY INTERSECTION
- PROJECT

Attachment H
2020 AM BACKGROUNDPEAK HOUR TRAFFIC PROJECTIONS



NOT TO SCALE



LEGEND

- STUDY INTERSECTION
- PROJECT

Attachment I
2020 PM BACKGROUND PEAK HOUR TRAFFIC PROJECTIONS

Attachment J
Level-of-Service Worksheets for 2020 AM Background Traffic
Projections Without Project Generated Traffic

HCM Signalized Intersection Capacity Analysis

1: LIPOA STREET & S. KIHEI ROAD

12/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1811	1583		1797	1583	1770	1863	1583	1770	1851	
Flt Permitted		0.77	1.00		0.73	1.00	0.45	1.00	1.00	0.35	1.00	
Satd. Flow (perm)		1438	1583		1356	1583	831	1863	1583	652	1851	
Volume (vph)	46	34	56	91	33	143	34	454	145	128	445	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	37	61	99	36	155	37	493	158	139	484	21
RTOR Reduction (vph)	0	0	50	0	0	127	0	0	73	0	2	0
Lane Group Flow (vph)	0	87	11	0	135	28	37	493	85	139	503	0
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)		10.9	10.9		10.9	10.9	34.2	32.6	32.6	41.0	36.0	
Effective Green, g (s)		10.9	10.9		10.9	10.9	34.2	32.6	32.6	41.0	36.0	
Actuated g/C Ratio		0.18	0.18		0.18	0.18	0.57	0.54	0.54	0.68	0.60	
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		259	285		244	285	495	1004	853	534	1101	
v/s Ratio Prot							0.00	0.26		c0.02	c0.27	
v/s Ratio Perm		0.06	0.04		c0.10	0.10	0.04		0.10	0.15		
v/c Ratio		0.34	0.04		0.55	0.10	0.07	0.49	0.10	0.26	0.46	
Uniform Delay, d1		21.6	20.5		22.6	20.7	5.9	8.7	6.8	4.4	6.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8	0.1		2.7	0.2	0.1	1.7	0.2	0.3	1.4	
Delay (s)		22.4	20.5		25.3	20.8	5.9	10.5	7.0	4.6	8.2	
Level of Service		C	C		C	C	A	B	A	A	A	
Approach Delay (s)		21.6			22.9			9.4			7.4	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM Average Control Delay			11.9				HCM Level of Service				B	
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			60.5				Sum of lost time (s)				12.0	
Intersection Capacity Utilization			54.4%				ICU Level of Service				A	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: PIIKEA STREET & S. KIHEI ROAD

12/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected					0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1786	1583	1770	1863	1583	1770	3527	
Flt Permitted					0.96	1.00	0.46	1.00	1.00	0.48	1.00	
Satd. Flow (perm)					1786	1583	865	1863	1583	898	3527	
Volume (vph)	0	0	0	124	21	105	9	409	150	126	457	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	135	23	114	10	445	163	137	497	12
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	51	0	2	0
Lane Group Flow (vph)	0	0	0	0	158	19	10	445	112	137	507	0
Turn Type				Split		Perm	Perm		Perm	Perm		
Protected Phases				8	8			2				6
Permitted Phases						8	2		2	6		
Actuated Green, G (s)					9.6	9.6	38.8	38.8	38.8	38.8	38.8	
Effective Green, g (s)					9.6	9.6	38.8	38.8	38.8	38.8	38.8	
Actuated g/C Ratio					0.17	0.17	0.69	0.69	0.69	0.69	0.69	
Clearance Time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)					304	269	595	1282	1089	618	2426	
v/s Ratio Prot					c0.09			c0.24			0.14	
v/s Ratio Perm						0.07	0.01		0.10	0.15		
v/c Ratio					0.52	0.07	0.02	0.35	0.10	0.22	0.21	
Uniform Delay, d1					21.3	19.7	2.8	3.6	3.0	3.2	3.2	
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2					1.5	0.1	0.1	0.7	0.2	0.8	0.2	
Delay (s)					22.8	19.8	2.8	4.4	3.1	4.1	3.4	
Level of Service					C	B	A	A	A	A	A	
Approach Delay (s)		0.0			21.5			4.0			3.5	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM Average Control Delay			6.9		HCM Level of Service					A		
HCM Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			56.4		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			46.5%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

1: LIPOA STREET & S. KIHEI ROAD

12/10/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	46	34	56	91	33	143	34	454	145	128	445
Lane Group Flow (vph)	0	87	61	0	135	155	37	493	158	139	505
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt	
Protected Phases		4			8		5	2		1	6
Permitted Phases	4		4	8		8	2		2	6	
Detector Phases	4	4	4	8	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	30.0	30.0	10.0	32.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	13.3%	50.0%	50.0%	16.7%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max						
v/c Ratio		0.31	0.18		0.52	0.37	0.09	0.50	0.17	0.29	0.44
Control Delay		20.0	6.6		22.7	5.5	5.5	12.7	2.6	5.9	9.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.0	6.6		22.7	5.5	5.5	12.7	2.6	5.9	9.2
Queue Length 50th (ft)		24	0		40	0	3	105	0	13	60
Queue Length 95th (ft)		56	23		83	37	14	215	27	38	206
Internal Link Dist (ft)		414			1021			1645			881
Turn Bay Length (ft)											
Base Capacity (vph)		380	449		354	519	434	989	915	477	1149
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.23	0.14		0.38	0.30	0.09	0.50	0.17	0.29	0.44

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 58.1

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Splits and Phases: 1: LIPOA STREET & S. KIHEI ROAD



Queues

2: PIIKEA STREET & S. KIHEI ROAD

12/10/2014

	←	↙	↘	↑	↗	↘	↓
Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↕	↕	↕	↕	↕	↕	↕↕
Volume (vph)	21	105	9	409	150	126	457
Lane Group Flow (vph)	158	114	10	445	163	137	509
Turn Type		Perm	Perm		Perm	Perm	
Protected Phases	8			2			6
Permitted Phases		8	2		2	6	
Detector Phases	8	8	2	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	27.0	27.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	Max	Max	Max	Max
v/c Ratio	0.48	0.30	0.02	0.34	0.14	0.27	0.21
Control Delay	17.3	4.7	4.3	5.4	1.3	6.3	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	4.7	4.3	5.4	1.3	6.3	4.1
Queue Length 50th (ft)	37	0	1	46	0	13	24
Queue Length 95th (ft)	78	29	6	110	17	45	52
Internal Link Dist (ft)	1035			881			230
Turn Bay Length (ft)							
Base Capacity (vph)	610	615	574	1299	1153	516	2459
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.19	0.02	0.34	0.14	0.27	0.21

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 56.3
 Natural Cycle: 40
 Control Type: Semi Act-Uncoord

Splits and Phases: 2: PIIKEA STREET & S. KIHEI ROAD



HCM Unsignalized Intersection Capacity Analysis
 3: LONG'S DRIVEWAY & S. KIHEI ROAD

12/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	2	91	6	2	20	86	481	10	25	553	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	2	99	7	2	22	93	523	11	27	601	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								310				
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	1414	1402	326	1165	1416	523	652			534		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1444	1431	326	1177	1447	488	652			500		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	48	98	85	94	98	96	90			97		
cM capacity (veh/h)	74	109	670	104	106	490	930			989		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	40	99	7	24	93	523	11	27	401	251		
Volume Left	38	0	7	0	93	0	0	27	0	0		
Volume Right	0	99	0	22	0	0	11	0	0	51		
cSH	75	670	104	369	930	1700	1700	989	1700	1700		
Volume to Capacity	0.54	0.15	0.06	0.06	0.10	0.31	0.01	0.03	0.24	0.15		
Queue Length 95th (ft)	57	13	5	5	8	0	0	2	0	0		
Control Delay (s)	98.8	11.3	42.1	15.4	9.3	0.0	0.0	8.7	0.0	0.0		
Lane LOS	F	B	E	C	A			A				
Approach Delay (s)	36.6		21.1		1.4			0.3				
Approach LOS	E		C									
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			47.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: NOHOKAI STREET & S. KIHEI ROAD

12/10/2014

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	12	4	512	641	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	13	4	557	697	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				681		
pX, platoon unblocked						
vC, conflicting volume	1264	698	700			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1264	698	700			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	97	100			
cM capacity (veh/h)	186	440	897			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	21	561	700			
Volume Left	8	4	0			
Volume Right	13	0	3			
cSH	293	897	1700			
Volume to Capacity	0.07	0.00	0.41			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	18.2	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	18.2	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			43.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: KAUHAA STREET & S. KIHEI ROAD

12/10/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	3	20	502	5	7	585
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	22	546	5	8	636
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1199	548			551	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1199	548			551	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			99	
cM capacity (veh/h)	203	536			1019	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	3	22	551	8	636	
Volume Left	3	0	0	8	0	
Volume Right	0	22	5	0	0	
cSH	203	536	1700	1019	1700	
Volume to Capacity	0.02	0.04	0.32	0.01	0.37	
Queue Length 95th (ft)	1	3	0	1	0	
Control Delay (s)	23.0	12.0	0.0	8.6	0.0	
Lane LOS	C	B		A		
Approach Delay (s)	13.4		0.0	0.1		
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			40.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
6: WAIPUILANI ROAD & S. KIHEI ROAD

12/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	19	2	13	17	3	75	9	518	17	28	554	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	2	14	18	3	82	10	563	18	30	602	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1340	1276	614	1270	1278	572	625			582		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1340	1276	614	1270	1278	572	625			582		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	99	97	86	98	84	99			97		
cM capacity (veh/h)	104	160	492	135	160	519	956			993		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	37	103	10	582	30	625						
Volume Left	21	18	10	0	30	0						
Volume Right	14	82	0	18	0	23						
cSH	154	329	956	1700	993	1700						
Volume to Capacity	0.24	0.31	0.01	0.34	0.03	0.37						
Queue Length 95th (ft)	22	33	1	0	2	0						
Control Delay (s)	35.7	20.9	8.8	0.0	8.7	0.0						
Lane LOS	E	C	A		A							
Approach Delay (s)	35.7	20.9	0.1		0.4							
Approach LOS	E	C										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			42.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Attachment K
Level-of-Service Worksheets for 2020 PM Background Traffic
Projections Without Project Generated Traffic

HCM Signalized Intersection Capacity Analysis

1: LIPOA STREET & S. KIHEI ROAD

12/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1815	1583		1793	1583	1770	1863	1583	1770	1851	
Flt Permitted		0.77	1.00		0.70	1.00	0.28	1.00	1.00	0.31	1.00	
Satd. Flow (perm)		1439	1583		1307	1583	514	1863	1583	572	1851	
Volume (vph)	52	47	66	123	34	111	42	555	131	71	598	27
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	51	72	134	37	121	46	603	142	77	650	29
RTOR Reduction (vph)	0	0	57	0	0	96	0	0	63	0	2	0
Lane Group Flow (vph)	0	108	15	0	171	25	46	603	79	77	677	0
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)		12.2	12.2		12.2	12.2	35.2	33.6	33.6	36.8	34.4	
Effective Green, g (s)		12.2	12.2		12.2	12.2	35.2	33.6	33.6	36.8	34.4	
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.58	0.56	0.56	0.61	0.57	
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		292	321		265	321	334	1040	884	397	1058	
v/s Ratio Prot							0.00	0.32		c0.01	c0.37	
v/s Ratio Perm		0.08	0.05		c0.13	0.08	0.08		0.09	0.11		
v/c Ratio		0.37	0.05		0.65	0.08	0.14	0.58	0.09	0.19	0.64	
Uniform Delay, d1		20.7	19.3		22.0	19.4	6.4	8.7	6.2	5.7	8.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8	0.1		5.3	0.1	0.2	2.4	0.2	0.2	3.0	
Delay (s)		21.5	19.4		27.3	19.5	6.6	11.0	6.4	5.9	11.7	
Level of Service		C	B		C	B	A	B	A	A	B	
Approach Delay (s)		20.6			24.1			9.9			11.1	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM Average Control Delay			13.4		HCM Level of Service					B		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			60.2		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			61.7%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2: PIIKEA STREET & S. KIHEI ROAD

12/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected					0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1781	1583	1770	1863	1583	1770	3528	
Flt Permitted					0.96	1.00	0.50	1.00	1.00	0.37	1.00	
Satd. Flow (perm)					1781	1583	929	1863	1583	695	3528	
Volume (vph)	0	0	0	187	16	126	6	537	157	83	393	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	203	17	137	7	584	171	90	427	9
RTOR Reduction (vph)	0	0	0	0	0	107	0	0	62	0	2	0
Lane Group Flow (vph)	0	0	0	0	220	30	7	584	109	90	434	0
Turn Type				Split		Perm	Perm		Perm	Perm		
Protected Phases				8	8			2				6
Permitted Phases						8	2		2	6		
Actuated Green, G (s)					12.0	12.0	35.1	35.1	35.1	35.1	35.1	35.1
Effective Green, g (s)					12.0	12.0	35.1	35.1	35.1	35.1	35.1	35.1
Actuated g/C Ratio					0.22	0.22	0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)					388	345	592	1187	1008	443	2247	
v/s Ratio Prot					c0.12			c0.31			0.12	
v/s Ratio Perm						0.09	0.01		0.11	0.13		
v/c Ratio					0.57	0.09	0.01	0.49	0.11	0.20	0.19	
Uniform Delay, d1					19.2	17.2	3.7	5.3	3.9	4.2	4.1	
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2					1.9	0.1	0.0	1.5	0.2	1.0	0.2	
Delay (s)					21.1	17.3	3.7	6.7	4.1	5.2	4.3	
Level of Service					C	B	A	A	A	A	A	
Approach Delay (s)		0.0			19.7			6.1			4.5	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			8.5		HCM Level of Service					A		
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			55.1		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			54.1%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

1: LIPOA STREET & S. KIHEI ROAD

12/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	57	47	73	127	34	122	46	690	144	84	743
Lane Group Flow (vph)	0	113	79	0	175	133	50	750	157	91	841
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt	
Protected Phases		4			8		5	2		1	6
Permitted Phases	4		4	8		8	2		2	6	
Detector Phases	4	4	4	8	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	32.0	32.0	8.0	32.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	13.3%	53.3%	53.3%	13.3%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max						
v/c Ratio		0.37	0.20		0.65	0.31	0.20	0.74	0.17	0.35	0.79
Control Delay		20.7	6.0		26.0	5.5	6.9	18.8	2.4	8.7	21.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.7	6.0		26.0	5.5	6.9	18.8	2.4	8.7	21.1
Queue Length 50th (ft)		32	0		53	0	5	198	0	10	241
Queue Length 95th (ft)		69	26		108	34	17	#432	25	27	#516
Internal Link Dist (ft)		414			1021			1645			881
Turn Bay Length (ft)											
Base Capacity (vph)		369	461		330	502	248	1017	935	259	1068
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.31	0.17		0.53	0.26	0.20	0.74	0.17	0.35	0.79

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Natural Cycle: 65

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: LIPOA STREET & S. KIHEI ROAD



Queues

2: PIIKEA STREET & S. KIHEI ROAD

12/8/2014

	←	↖	↗	↑	↘	↙	↓
Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↑	↘	↙	↑
Volume (vph)	16	181	7	578	261	135	433
Lane Group Flow (vph)	326	197	8	628	284	147	481
Turn Type		Perm	Perm		Perm	Perm	
Protected Phases	8			2			6
Permitted Phases		8	2		2	6	
Detector Phases	8	8	2	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	23.0	23.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	38.3%	38.3%	61.7%	61.7%	61.7%	61.7%	61.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	Max	Max	Max	Max
v/c Ratio	0.70	0.35	0.02	0.56	0.27	0.46	0.23
Control Delay	23.1	4.4	6.1	10.4	1.8	13.6	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	4.4	6.1	10.4	1.8	13.6	6.3
Queue Length 50th (ft)	97	0	1	113	0	24	34
Queue Length 95th (ft)	169	38	6	229	27	79	64
Internal Link Dist (ft)	1035			881			230
Turn Bay Length (ft)							
Base Capacity (vph)	557	631	523	1112	1059	323	2108
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.31	0.02	0.56	0.27	0.46	0.23

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 56.7
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 2: PIIKEA STREET & S. KIHEI ROAD



HCM Unsignalized Intersection Capacity Analysis
 3: LONG'S DRIVEWAY & S. KIHEI ROAD

12/8/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	2	47	21	3	97	61	635	32	67	597	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	2	51	23	3	105	66	690	35	73	649	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								310				
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81				0.81		
vC, conflicting volume	1739	1667	339	1345	1647	690	678			725		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1914	1825	339	1427	1800	617	678			660		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	96	92	62	94	70	93			90		
cM capacity (veh/h)	19	52	657	60	53	350	910			747		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	40	51	23	109	66	690	35	73	433	246		
Volume Left	38	0	23	0	66	0	0	73	0	0		
Volume Right	0	51	0	105	0	0	35	0	0	29		
cSH	20	657	60	300	910	1700	1700	747	1700	1700		
Volume to Capacity	2.00	0.08	0.38	0.36	0.07	0.41	0.02	0.10	0.25	0.14		
Queue Length 95th (ft)	134	6	35	40	6	0	0	8	0	0		
Control Delay (s)	872.0	10.9	97.1	23.7	9.3	0.0	0.0	10.3	0.0	0.0		
Lane LOS	F	B	F	C	A			B				
Approach Delay (s)	390.2		36.4		0.8			1.0				
Approach LOS	F		E									
Intersection Summary												
Average Delay			23.7									
Intersection Capacity Utilization			55.8%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: NOHOKAI STREET & S. KIHEI ROAD

12/8/2014

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	13	15	778	681	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	14	16	846	740	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				681		
pX, platoon unblocked	0.85					
vC, conflicting volume	1626	748	755			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1739	748	755			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	97	98			
cM capacity (veh/h)	79	412	855			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	21	862	755			
Volume Left	7	16	0			
Volume Right	14	0	15			
cSH	178	855	1700			
Volume to Capacity	0.12	0.02	0.44			
Queue Length 95th (ft)	10	1	0			
Control Delay (s)	27.9	0.5	0.0			
Lane LOS	D	A				
Approach Delay (s)	27.9	0.5	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			63.0%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: KAUHAA STREET & S. KIHEI ROAD

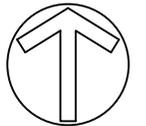
12/8/2014

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	6	25	771	14	18	684
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	27	838	15	20	743
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1628	846			853	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1628	846			853	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	93			98	
cM capacity (veh/h)	109	362			786	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	7	27	853	20	743	
Volume Left	7	0	0	20	0	
Volume Right	0	27	15	0	0	
cSH	109	362	1700	786	1700	
Volume to Capacity	0.06	0.07	0.50	0.02	0.44	
Queue Length 95th (ft)	5	6	0	2	0	
Control Delay (s)	40.0	15.7	0.0	9.7	0.0	
Lane LOS	E	C		A		
Approach Delay (s)	20.4		0.0	0.2		
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			51.4%		ICU Level of Service	A
Analysis Period (min)			15			

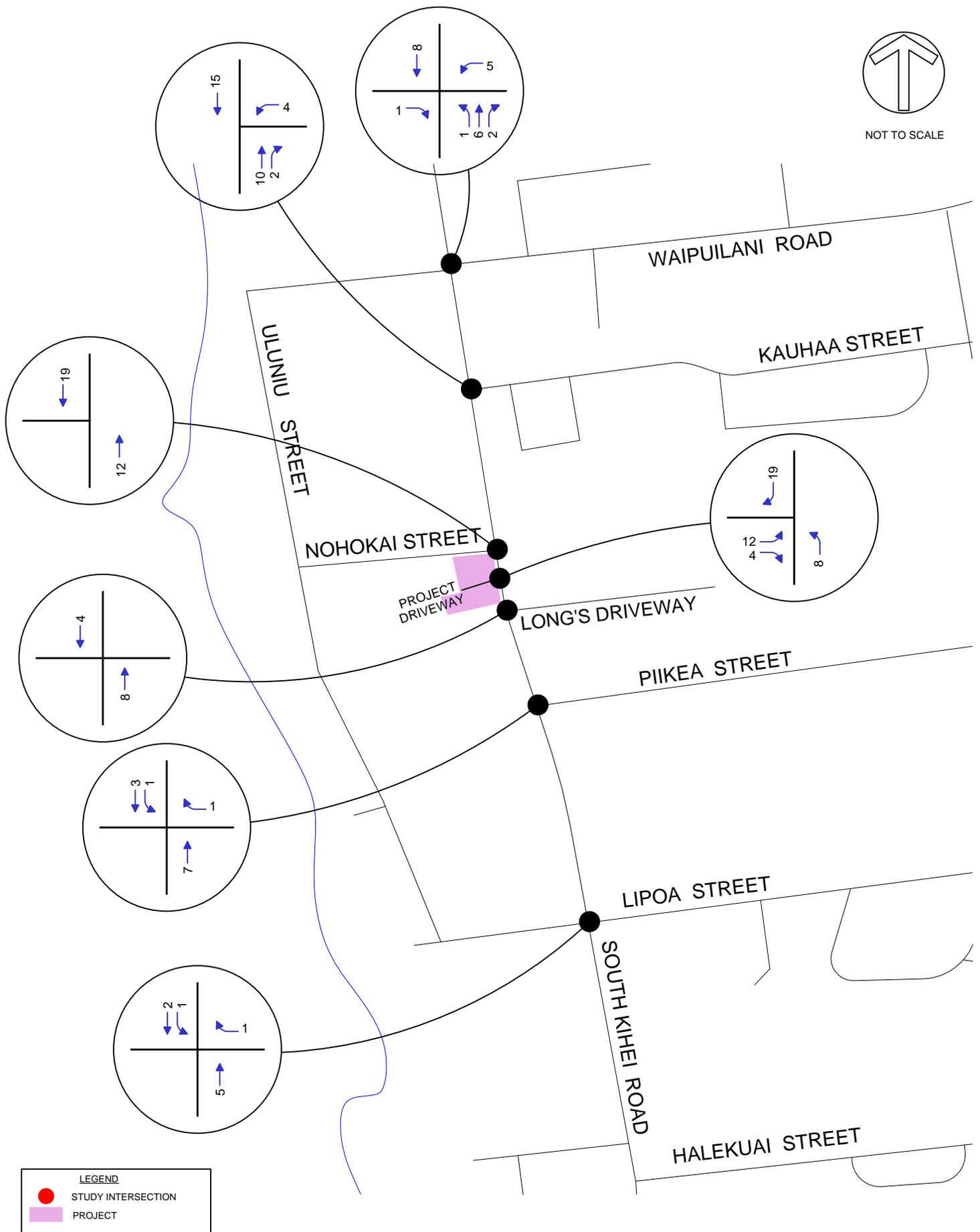
HCM Unsignalized Intersection Capacity Analysis
6: WAIPUILANI ROAD & S. KIHEI ROAD

12/8/2014

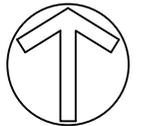
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	3	19	18	2	100	17	766	23	47	634	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	3	21	20	2	109	18	833	25	51	689	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1778	1693	697	1696	1689	845	704			858		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1778	1693	697	1696	1689	845	704			858		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	60	96	95	69	97	70	98			93		
cM capacity (veh/h)	41	85	441	63	86	363	893			783		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	40	130	18	858	51	704						
Volume Left	16	20	18	0	51	0						
Volume Right	21	109	0	25	0	15						
cSH	84	206	893	1700	783	1700						
Volume to Capacity	0.48	0.63	0.02	0.50	0.07	0.41						
Queue Length 95th (ft)	51	93	2	0	5	0						
Control Delay (s)	82.9	48.6	9.1	0.0	9.9	0.0						
Lane LOS	F	E	A		A							
Approach Delay (s)	82.9	48.6	0.2		0.7							
Approach LOS	F	E										
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utilization			56.1%		ICU Level of Service					B		
Analysis Period (min)			15									



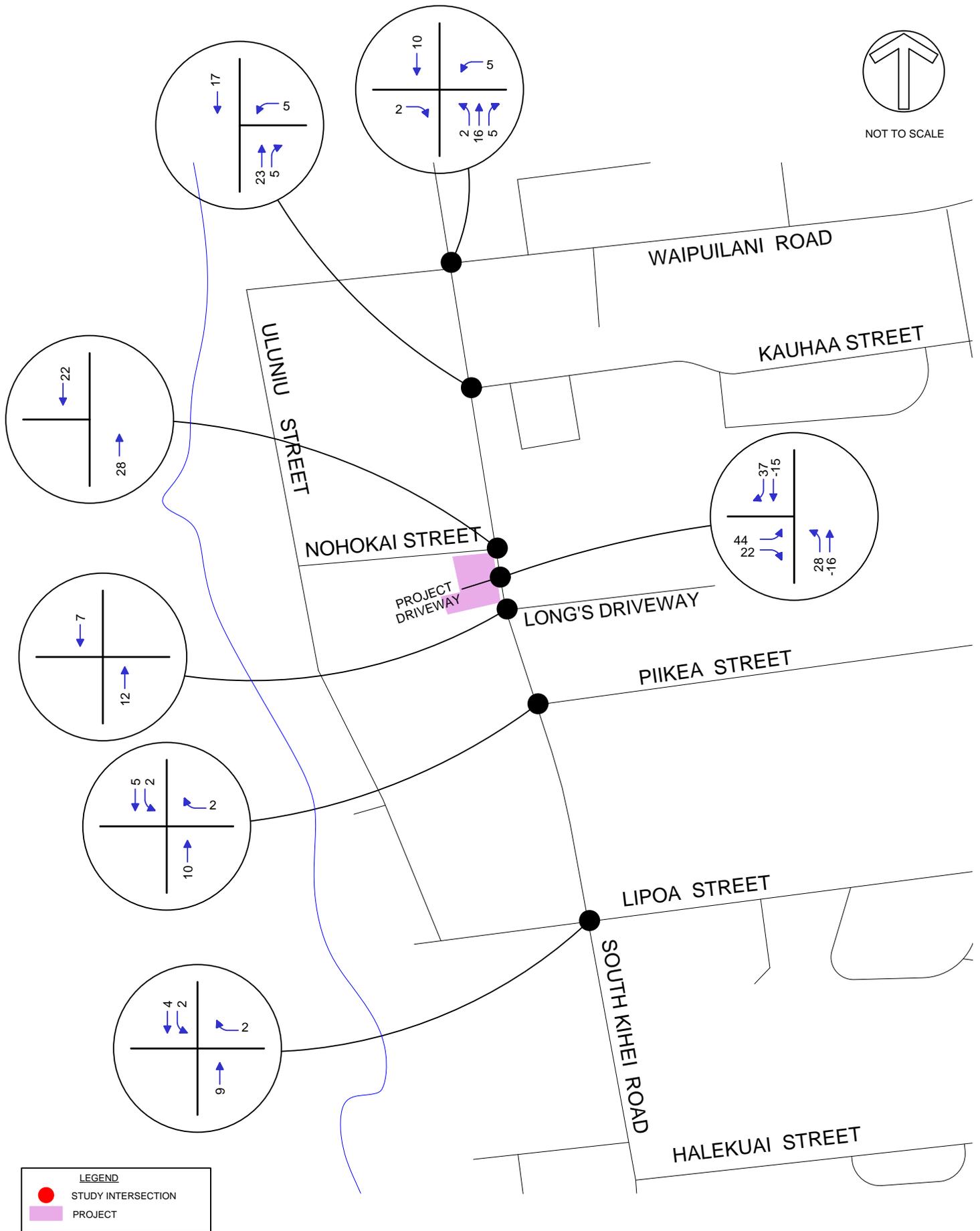
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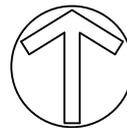
Attachment L
PROJECT TRIP ASSIGNMENTS - AM PEAK HOUR



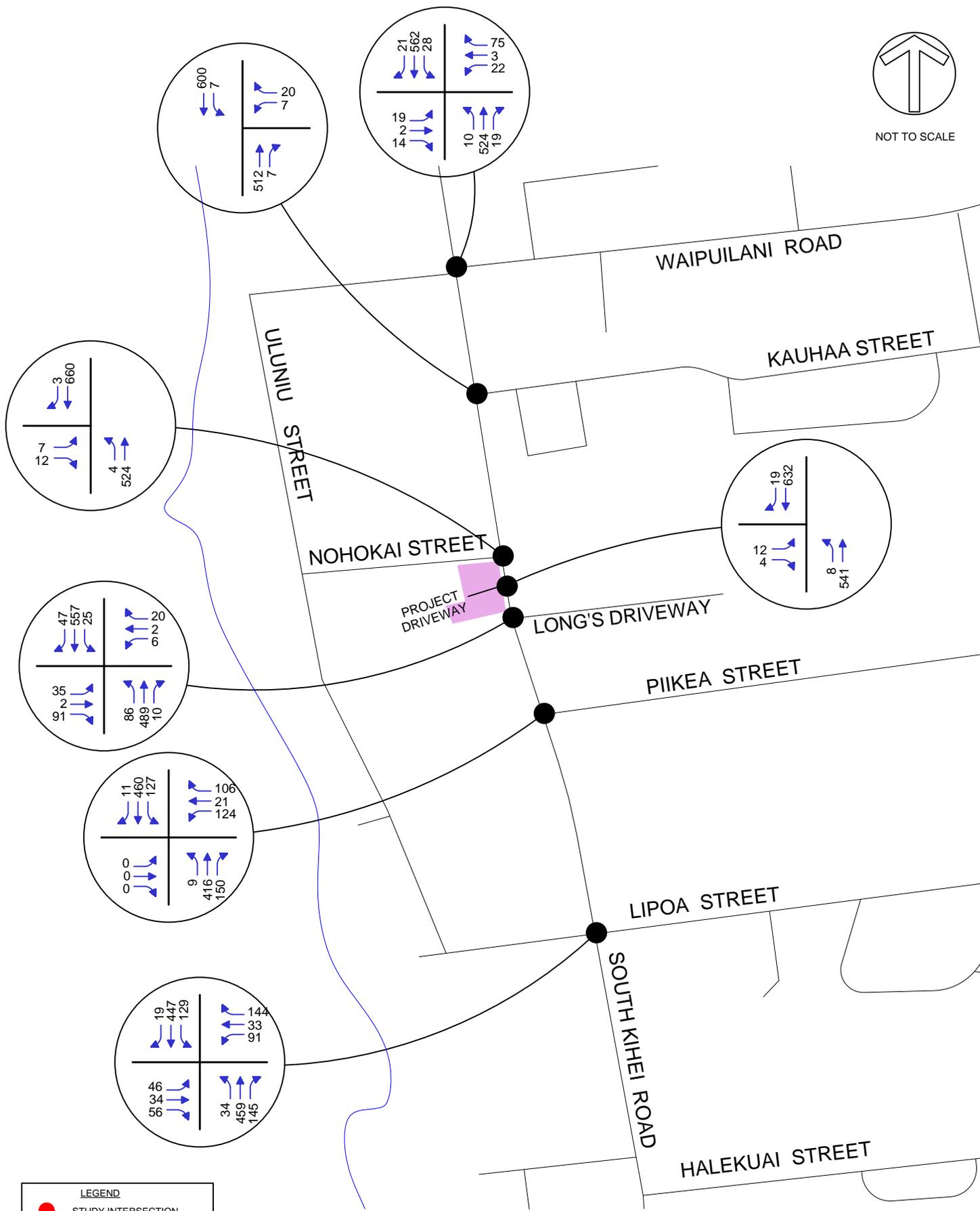
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Attachment M
PROJECT TRIP ASSIGNMENTS - PM PEAK HOUR



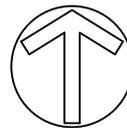
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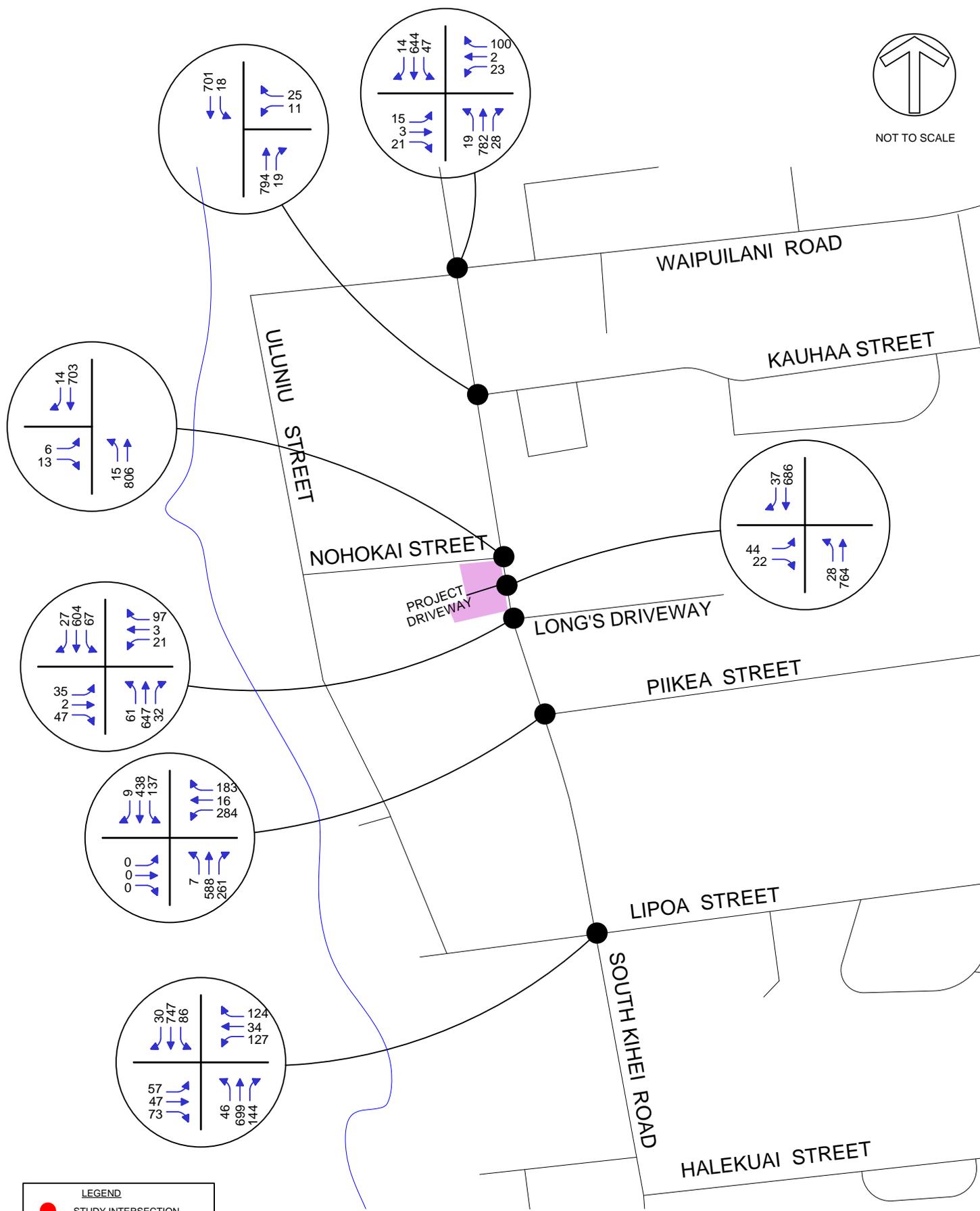
LEGEND

- STUDY INTERSECTION
- PROJECT

Attachment N
 2020 AM BACKGROUND PLUS PROJECT
 PEAK HOUR TRAFFIC PROJECTIONS



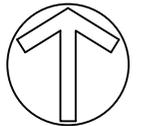
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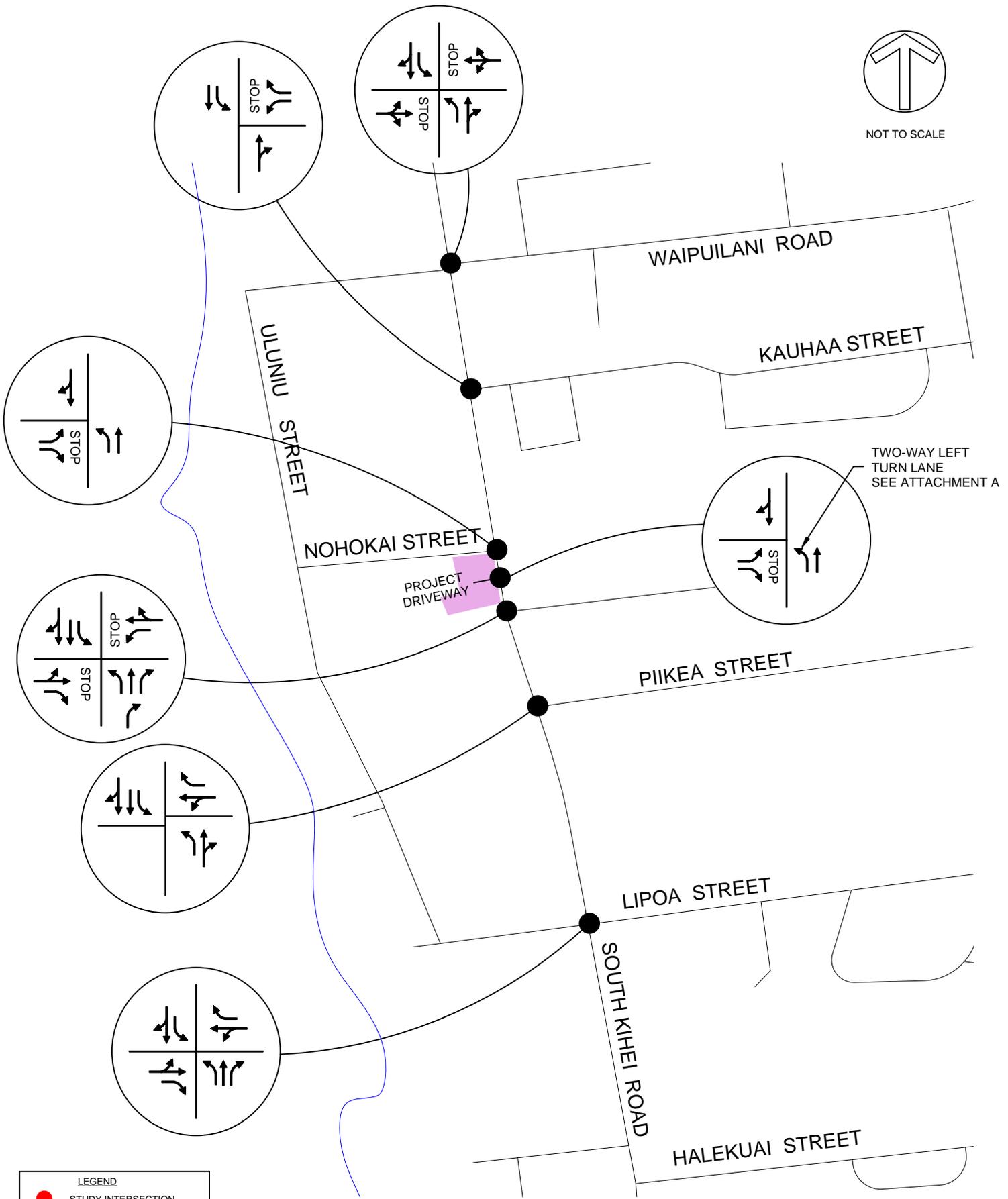
LEGEND

- STUDY INTERSECTION
- PROJECT

Attachment O
 2020 PM BACKGROUND PLUS PROJECT
 PEAK HOUR TRAFFIC PROJECTIONS



NOT TO SCALE



LEGEND	
	STUDY INTERSECTION
	PROJECT
	BUS STOP

Attachment P
 2020 LANE CONFIGURATIONS AND
 RIGHT-OF-WAY CONTROLS

Attachment Q
Level-of-Service Worksheets for 2020 AM Background Plus
Project Traffic Projections

HCM Signalized Intersection Capacity Analysis
 1: LIPOA STREET & S. KIHEI ROAD

3/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1811	1583		1797	1583	1770	1863	1583	1770	1851	
Flt Permitted		0.77	1.00		0.73	1.00	0.44	1.00	1.00	0.35	1.00	
Satd. Flow (perm)		1437	1583		1356	1583	829	1863	1583	645	1851	
Volume (vph)	46	34	56	91	33	144	34	459	145	129	447	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	37	61	99	36	157	37	499	158	140	486	21
RTOR Reduction (vph)	0	0	50	0	0	129	0	0	73	0	2	0
Lane Group Flow (vph)	0	87	11	0	135	28	37	499	85	140	505	0
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)		10.9	10.9		10.9	10.9	34.4	32.8	32.8	41.2	36.2	
Effective Green, g (s)		10.9	10.9		10.9	10.9	34.4	32.8	32.8	41.2	36.2	
Actuated g/C Ratio		0.18	0.18		0.18	0.18	0.57	0.54	0.54	0.68	0.60	
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		258	284		243	284	495	1007	855	530	1104	
v/s Ratio Prot							0.00	c0.27		c0.02	0.27	
v/s Ratio Perm		0.06	0.04		c0.10	0.10	0.04		0.10	0.16		
v/c Ratio		0.34	0.04		0.56	0.10	0.07	0.50	0.10	0.26	0.46	
Uniform Delay, d1		21.7	20.6		22.7	20.8	5.9	8.8	6.8	4.4	6.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8	0.1		2.7	0.2	0.1	1.7	0.2	0.3	1.4	
Delay (s)		22.5	20.6		25.4	21.0	5.9	10.5	7.0	4.7	8.2	
Level of Service		C	C		C	C	A	B	A	A	A	
Approach Delay (s)		21.7			23.0			9.5			7.4	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM Average Control Delay			12.0				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			60.7				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			54.7%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2: PIIKEA STREET & S. KIHEI ROAD

3/26/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor					1.00	1.00	1.00	1.00	1.00	1.00	0.95		
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00		
Flt Protected					0.96	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)					1786	1583	1770	1863	1583	1770	3527		
Flt Permitted					0.96	1.00	0.46	1.00	1.00	0.48	1.00		
Satd. Flow (perm)					1786	1583	863	1863	1583	889	3527		
Volume (vph)	0	0	0	124	21	106	9	416	150	127	460	11	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	135	23	115	10	452	163	138	500	12	
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	51	0	2	0	
Lane Group Flow (vph)	0	0	0	0	158	20	10	452	112	138	510	0	
Turn Type				Split		Perm	Perm		Perm	Perm			
Protected Phases				8	8			2				6	
Permitted Phases						8	2		2	6			
Actuated Green, G (s)					9.6	9.6	38.5	38.5	38.5	38.5	38.5		
Effective Green, g (s)					9.6	9.6	38.5	38.5	38.5	38.5	38.5		
Actuated g/C Ratio					0.17	0.17	0.69	0.69	0.69	0.69	0.69		
Clearance Time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)					306	271	592	1279	1086	610	2420		
v/s Ratio Prot					c0.09			c0.24			0.15		
v/s Ratio Perm						0.07	0.01		0.10	0.16			
v/c Ratio					0.52	0.07	0.02	0.35	0.10	0.23	0.21		
Uniform Delay, d1					21.1	19.5	2.8	3.6	3.0	3.3	3.2		
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2					1.5	0.1	0.1	0.8	0.2	0.9	0.2		
Delay (s)					22.6	19.6	2.8	4.4	3.2	4.1	3.4		
Level of Service					C	B	A	A	A	A	A		
Approach Delay (s)		0.0			21.4			4.1			3.6		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM Average Control Delay			6.9		HCM Level of Service					A			
HCM Volume to Capacity ratio			0.39										
Actuated Cycle Length (s)			56.1		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			46.9%		ICU Level of Service					A			
Analysis Period (min)			15										
c Critical Lane Group													

Queues

1: LIPOA STREET & S. KIHEI ROAD

3/26/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	46	34	56	91	33	144	34	459	145	129	447
Lane Group Flow (vph)	0	87	61	0	135	157	37	499	158	140	507
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt	
Protected Phases		4			8		5	2		1	6
Permitted Phases	4		4	8		8	2		2	6	
Detector Phases	4	4	4	8	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	30.0	30.0	10.0	32.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	13.3%	50.0%	50.0%	16.7%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max						
v/c Ratio		0.31	0.18		0.52	0.37	0.09	0.50	0.17	0.30	0.44
Control Delay		20.0	6.6		22.7	5.5	5.5	12.7	2.6	5.9	9.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.0	6.6		22.7	5.5	5.5	12.7	2.6	5.9	9.2
Queue Length 50th (ft)		24	0		40	0	3	107	0	13	60
Queue Length 95th (ft)		56	23		83	37	14	219	27	38	207
Internal Link Dist (ft)		414			1021			1645			881
Turn Bay Length (ft)											
Base Capacity (vph)		379	448		352	519	432	991	916	472	1151
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.23	0.14		0.38	0.30	0.09	0.50	0.17	0.30	0.44

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 58.4
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 1: LIPOA STREET & S. KIHEI ROAD



Queues

2: PIIKEA STREET & S. KIHEI ROAD

3/26/2015

	←	↖	↗	↑	↘	↙	↓
Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↑	↘	↙	↖
Volume (vph)	21	106	9	416	150	127	460
Lane Group Flow (vph)	158	115	10	452	163	138	512
Turn Type		Perm	Perm		Perm	Perm	
Protected Phases	8			2			6
Permitted Phases		8	2		2	6	
Detector Phases	8	8	2	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	27.0	27.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	Max	Max	Max	Max
v/c Ratio	0.48	0.30	0.02	0.35	0.14	0.27	0.21
Control Delay	17.2	4.7	4.3	5.4	1.3	6.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	4.7	4.3	5.4	1.3	6.4	4.1
Queue Length 50th (ft)	37	0	1	47	0	13	24
Queue Length 95th (ft)	78	29	6	112	17	46	52
Internal Link Dist (ft)	1035			881			230
Turn Bay Length (ft)							
Base Capacity (vph)	611	617	572	1299	1153	508	2459
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.19	0.02	0.35	0.14	0.27	0.21

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 56
 Natural Cycle: 40
 Control Type: Semi Act-Uncoord

Splits and Phases: 2: PIIKEA STREET & S. KIHEI ROAD



HCM Unsignalized Intersection Capacity Analysis
 3: LONG'S DRIVEWAY & S. KIHEI ROAD

3/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	2	91	6	2	20	86	489	10	25	557	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	2	99	7	2	22	93	532	11	27	605	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								310				
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	1427	1415	328	1176	1429	532	657			542		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1459	1447	328	1189	1462	495	657			507		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	47	98	85	94	98	95	90			97		
cM capacity (veh/h)	71	106	667	101	104	483	927			979		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	40	99	7	24	93	532	11	27	404	253		
Volume Left	38	0	7	0	93	0	0	27	0	0		
Volume Right	0	99	0	22	0	0	11	0	0	51		
cSH	73	667	101	362	927	1700	1700	979	1700	1700		
Volume to Capacity	0.55	0.15	0.06	0.07	0.10	0.31	0.01	0.03	0.24	0.15		
Queue Length 95th (ft)	59	13	5	5	8	0	0	2	0	0		
Control Delay (s)	104.2	11.3	43.1	15.6	9.3	0.0	0.0	8.8	0.0	0.0		
Lane LOS	F	B	E	C	A			A				
Approach Delay (s)	38.2		21.5		1.4			0.3				
Approach LOS	E		C									
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			47.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
4: NOHOKAI STREET & S. KIHEI ROAD

3/26/2015

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	12	4	524	660	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	13	4	570	717	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				681		
pX, platoon unblocked						
vC, conflicting volume	1297	719	721			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1297	719	721			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	97	100			
cM capacity (veh/h)	178	428	881			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	8	13	4	570	721	
Volume Left	8	0	4	0	0	
Volume Right	0	13	0	0	3	
cSH	178	428	881	1700	1700	
Volume to Capacity	0.04	0.03	0.00	0.34	0.42	
Queue Length 95th (ft)	3	2	0	0	0	
Control Delay (s)	26.2	13.7	9.1	0.0	0.0	
Lane LOS	D	B	A			
Approach Delay (s)	18.3		0.1		0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			44.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: KAUHAA STREET & S. KIHEI ROAD

3/26/2015

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	7	20	512	7	7	600
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	22	557	8	8	652
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1228	560			564	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1228	560			564	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	96			99	
cM capacity (veh/h)	195	528			1007	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	8	22	564	8	652	
Volume Left	8	0	0	8	0	
Volume Right	0	22	8	0	0	
cSH	195	528	1700	1007	1700	
Volume to Capacity	0.04	0.04	0.33	0.01	0.38	
Queue Length 95th (ft)	3	3	0	1	0	
Control Delay (s)	24.2	12.1	0.0	8.6	0.0	
Lane LOS	C	B		A		
Approach Delay (s)	15.2		0.0	0.1		
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			41.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
6: WAIPUILANI ROAD & S. KIHEI ROAD

3/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	19	2	14	22	3	75	10	524	19	28	562	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	2	15	24	3	82	11	570	21	30	611	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1358	1295	622	1290	1296	580	634			590		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1358	1295	622	1290	1296	580	634			590		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	99	97	82	98	84	99			97		
cM capacity (veh/h)	101	155	487	130	155	514	949			985		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	38	109	11	590	30	634						
Volume Left	21	24	11	0	30	0						
Volume Right	15	82	0	21	0	23						
cSH	152	299	949	1700	985	1700						
Volume to Capacity	0.25	0.36	0.01	0.35	0.03	0.37						
Queue Length 95th (ft)	23	40	1	0	2	0						
Control Delay (s)	36.3	23.7	8.8	0.0	8.8	0.0						
Lane LOS	E	C	A		A							
Approach Delay (s)	36.3	23.7	0.2		0.4							
Approach LOS	E	C										
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			43.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
7: PROJECT DRIVEWAY & S. KIHEI ROAD

3/26/2015

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	12	4	8	541	632	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	4	9	588	687	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT					
Median storage (veh)	1					
Upstream signal (ft)				495		
pX, platoon unblocked	0.95					
vC, conflicting volume	1303	697	708			
vC1, stage 1 conf vol	697					
vC2, stage 2 conf vol	605					
vCu, unblocked vol	1320	697	708			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	99			
cM capacity (veh/h)	306	441	891			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	13	4	597	708		
Volume Left	13	0	9	0		
Volume Right	0	4	0	21		
cSH	306	441	891	1700		
Volume to Capacity	0.04	0.01	0.01	0.42		
Queue Length 95th (ft)	3	1	1	0		
Control Delay (s)	17.3	13.2	0.3	0.0		
Lane LOS	C	B	A			
Approach Delay (s)	16.3		0.3	0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			44.9%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment R
Level-of-Service Worksheets for 2020 PM Background Plus
Project Traffic Projections

HCM Signalized Intersection Capacity Analysis
 1: LIPOA STREET & S. KIHEI ROAD

3/26/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1813	1583		1792	1583	1770	1863	1583	1770	1852		
Flt Permitted		0.75	1.00		0.70	1.00	0.15	1.00	1.00	0.19	1.00		
Satd. Flow (perm)		1404	1583		1299	1583	282	1863	1583	350	1852		
Volume (vph)	57	47	73	127	34	124	46	699	144	86	747	30	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	62	51	79	138	37	135	50	760	157	93	812	33	
RTOR Reduction (vph)	0	0	63	0	0	107	0	0	71	0	2	0	
Lane Group Flow (vph)	0	113	16	0	175	28	50	760	86	93	843	0	
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt			
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4		4	8		8	2		2	6			
Actuated Green, G (s)		12.5	12.5		12.5	12.5	35.8	33.4	33.4	37.6	34.3		
Effective Green, g (s)		12.5	12.5		12.5	12.5	35.8	33.4	33.4	37.6	34.3		
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.58	0.55	0.55	0.61	0.56		
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		287	323		265	323	223	1017	864	292	1038		
v/s Ratio Prot							0.01	0.41		c0.02	c0.46		
v/s Ratio Perm		0.08	0.05		c0.13	0.09	0.12		0.10	0.18			
v/c Ratio		0.39	0.05		0.66	0.09	0.22	0.75	0.10	0.32	0.81		
Uniform Delay, d1		21.1	19.6		22.4	19.7	8.6	10.7	6.7	7.6	10.8		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.9	0.1		6.0	0.1	0.5	5.0	0.2	0.6	6.9		
Delay (s)		22.0	19.6		28.4	19.8	9.1	15.7	6.9	8.2	17.8		
Level of Service		C	B		C	B	A	B	A	A	B		
Approach Delay (s)		21.0			24.7			13.9			16.8		
Approach LOS		C			C			B			B		
Intersection Summary													
HCM Average Control Delay			17.0									HCM Level of Service	B
HCM Volume to Capacity ratio			0.70										
Actuated Cycle Length (s)			61.2									Sum of lost time (s)	8.0
Intersection Capacity Utilization			70.0%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2: PIIKEA STREET & S. KIHEI ROAD

3/26/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor					1.00	1.00	1.00	1.00	1.00	1.00	0.95		
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00		
Flt Protected					0.95	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)					1778	1583	1770	1863	1583	1770	3528		
Flt Permitted					0.95	1.00	0.48	1.00	1.00	0.32	1.00		
Satd. Flow (perm)					1778	1583	885	1863	1583	588	3528		
Volume (vph)	0	0	0	284	16	183	7	588	261	137	438	9	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	309	17	199	8	639	284	149	476	10	
RTOR Reduction (vph)	0	0	0	0	0	147	0	0	114	0	2	0	
Lane Group Flow (vph)	0	0	0	0	326	52	8	639	170	149	484	0	
Turn Type				Split		Perm	Perm		Perm	Perm			
Protected Phases				8	8			2				6	
Permitted Phases						8	2		2	6			
Actuated Green, G (s)					14.8	14.8	33.8	33.8	33.8	33.8	33.8		
Effective Green, g (s)					14.8	14.8	33.8	33.8	33.8	33.8	33.8		
Actuated g/C Ratio					0.26	0.26	0.60	0.60	0.60	0.60	0.60		
Clearance Time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)					465	414	528	1113	945	351	2107		
v/s Ratio Prot					c0.18			c0.34			0.14		
v/s Ratio Perm						0.13	0.01		0.18	0.25			
v/c Ratio					0.70	0.13	0.02	0.57	0.18	0.42	0.23		
Uniform Delay, d1					18.9	16.0	4.6	7.0	5.1	6.2	5.3		
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2					4.7	0.1	0.1	2.2	0.4	3.7	0.3		
Delay (s)					23.6	16.1	4.7	9.1	5.6	9.9	5.6		
Level of Service					C	B	A	A	A	A	A		
Approach Delay (s)		0.0			20.8			8.0			6.6		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM Average Control Delay			10.8		HCM Level of Service					B			
HCM Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			56.6		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			65.1%		ICU Level of Service					C			
Analysis Period (min)			15										
c Critical Lane Group													

Queues

1: LIPOA STREET & S. KIHEI ROAD

3/26/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	57	47	73	127	34	124	46	699	144	86	747
Lane Group Flow (vph)	0	113	79	0	175	135	50	760	157	93	845
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt	
Protected Phases		4			8		5	2		1	6
Permitted Phases	4		4	8		8	2		2	6	
Detector Phases	4	4	4	8	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	32.0	32.0	8.0	32.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	13.3%	53.3%	53.3%	13.3%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max						
v/c Ratio		0.37	0.20		0.65	0.31	0.20	0.75	0.17	0.36	0.79
Control Delay		20.7	6.0		25.9	5.4	6.9	19.3	2.4	8.8	21.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.7	6.0		25.9	5.4	6.9	19.3	2.4	8.8	21.4
Queue Length 50th (ft)		32	0		53	0	5	202	0	10	243
Queue Length 95th (ft)		69	26		108	34	17	#440	25	27	#519
Internal Link Dist (ft)		414			1021			1645			881
Turn Bay Length (ft)											
Base Capacity (vph)		370	462		331	504	248	1015	934	259	1066
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.31	0.17		0.53	0.27	0.20	0.75	0.17	0.36	0.79

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 59.7

Natural Cycle: 65

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: LIPOA STREET & S. KIHEI ROAD



Queues

2: PIIKEA STREET & S. KIHEI ROAD

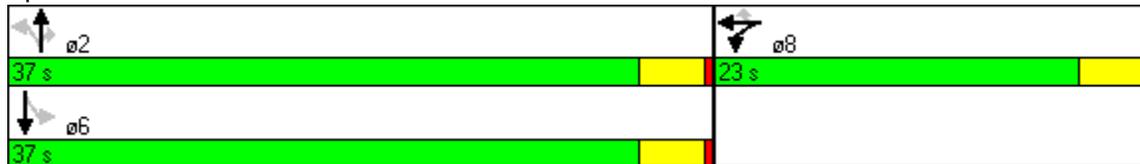
3/26/2015

	←	↖	↗	↑	↘	↙	↓
Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↑	↘	↙	↖
Volume (vph)	16	183	7	588	261	137	438
Lane Group Flow (vph)	326	199	8	639	284	149	486
Turn Type		Perm	Perm		Perm	Perm	
Protected Phases	8			2			6
Permitted Phases		8	2		2	6	
Detector Phases	8	8	2	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	23.0	23.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	38.3%	38.3%	61.7%	61.7%	61.7%	61.7%	61.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	Max	Max	Max	Max
v/c Ratio	0.70	0.35	0.02	0.57	0.27	0.47	0.23
Control Delay	23.1	4.4	6.1	10.6	1.8	14.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	4.4	6.1	10.6	1.8	14.3	6.3
Queue Length 50th (ft)	97	0	1	116	0	25	35
Queue Length 95th (ft)	169	38	6	236	27	84	65
Internal Link Dist (ft)	1035			881			230
Turn Bay Length (ft)							
Base Capacity (vph)	557	632	521	1112	1059	315	2108
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.31	0.02	0.57	0.27	0.47	0.23

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 56.6
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 2: PIIKEA STREET & S. KIHEI ROAD



HCM Unsignalized Intersection Capacity Analysis
 3: LONG'S DRIVEWAY & S. KIHEI ROAD

3/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	2	47	21	3	97	61	647	32	67	604	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	2	51	23	3	105	66	703	35	73	657	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								310				
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	1760	1688	343	1362	1667	703	686			738		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1947	1857	343	1451	1832	630	686			673		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	96	92	60	94	69	93			90		
cM capacity (veh/h)	18	49	653	57	50	340	904			733		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	40	51	23	109	66	703	35	73	438	248		
Volume Left	38	0	23	0	66	0	0	73	0	0		
Volume Right	0	51	0	105	0	0	35	0	0	29		
cSH	18	653	57	290	904	1700	1700	733	1700	1700		
Volume to Capacity	2.18	0.08	0.40	0.37	0.07	0.41	0.02	0.10	0.26	0.15		
Queue Length 95th (ft)	137	6	37	42	6	0	0	8	0	0		
Control Delay (s)	976.8	11.0	104.8	24.6	9.3	0.0	0.0	10.5	0.0	0.0		
Lane LOS	F	B	F	C	A			B				
Approach Delay (s)	436.4		38.5		0.8			1.0				
Approach LOS	F		E									
Intersection Summary												
Average Delay			25.9									
Intersection Capacity Utilization			56.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: NOHOKAI STREET & S. KIHEI ROAD

3/26/2015

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	13	15	806	703	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	14	16	876	764	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				681		
pX, platoon unblocked	0.86					
vC, conflicting volume	1680	772	779			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1791	772	779			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	96	98			
cM capacity (veh/h)	75	400	838			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	7	14	16	876	779	
Volume Left	7	0	16	0	0	
Volume Right	0	14	0	0	15	
cSH	75	400	838	1700	1700	
Volume to Capacity	0.09	0.04	0.02	0.52	0.46	
Queue Length 95th (ft)	7	3	1	0	0	
Control Delay (s)	57.5	14.3	9.4	0.0	0.0	
Lane LOS	F	B	A			
Approach Delay (s)	28.0		0.2		0.0	
Approach LOS	D					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			52.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: KAUHAA STREET & S. KIHEI ROAD

3/26/2015

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	11	25	794	19	18	701
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	27	863	21	20	762
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1674	873			884	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1674	873			884	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	92			97	
cM capacity (veh/h)	102	349			766	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	12	27	884	20	762	
Volume Left	12	0	0	20	0	
Volume Right	0	27	21	0	0	
cSH	102	349	1700	766	1700	
Volume to Capacity	0.12	0.08	0.52	0.03	0.45	
Queue Length 95th (ft)	10	6	0	2	0	
Control Delay (s)	44.8	16.2	0.0	9.8	0.0	
Lane LOS	E	C		A		
Approach Delay (s)	24.9		0.0	0.2		
Approach LOS	C					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			52.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
6: WAIPUILANI ROAD & S. KIHEI ROAD

3/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	3	21	23	2	100	19	782	28	47	644	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	3	23	25	2	109	21	850	30	51	700	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1811	1732	708	1733	1724	865	715			880		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1811	1732	708	1733	1724	865	715			880		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	58	96	95	58	97	69	98			93		
cM capacity (veh/h)	38	80	435	59	81	353	885			768		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	42	136	21	880	51	715						
Volume Left	16	25	21	0	51	0						
Volume Right	23	109	0	30	0	15						
cSH	82	179	885	1700	768	1700						
Volume to Capacity	0.52	0.76	0.02	0.52	0.07	0.42						
Queue Length 95th (ft)	55	123	2	0	5	0						
Control Delay (s)	88.8	69.7	9.2	0.0	10.0	0.0						
Lane LOS	F	F	A		B							
Approach Delay (s)	88.8	69.7	0.2		0.7							
Approach LOS	F	F										
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			57.8%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: PROJECT DRIVEWAY & S. KIHEI ROAD

3/26/2015

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	44	22	28	764	686	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	24	30	830	746	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage (veh)	1					
Upstream signal (ft)				495		
pX, platoon unblocked	0.81					
vC, conflicting volume	1657	766	786			
vC1, stage 1 conf vol	766					
vC2, stage 2 conf vol	891					
vCu, unblocked vol	1813	766	786			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	94	96			
cM capacity (veh/h)	202	403	833			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	48	24	861	786		
Volume Left	48	0	30	0		
Volume Right	0	24	0	40		
cSH	202	403	833	1700		
Volume to Capacity	0.24	0.06	0.04	0.46		
Queue Length 95th (ft)	22	5	3	0		
Control Delay (s)	28.3	14.5	1.0	0.0		
Lane LOS	D	B	A			
Approach Delay (s)	23.7		1.0	0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			72.9%	ICU Level of Service	C	
Analysis Period (min)			15			

the Maui Department of Public Works' roadway standards for commercial uses and Maui County's "Complete Streets" bicycle and pedestrian facilities policy. More specifically, these improvements will include:

1. Widening South Kihei Road in front of the site by 12 feet to:
 - a. Increase the public right-of-way (the widened area will be dedicated to the County),
 - b. Provide a median along South Kihei Road to accommodate a two-way left turn lane up to Nohokai Street; this median will allow left turns into the Walgreens driveway and onto Nohokai Street,
 - c. Provide bike lanes along both sides of South Kihei Road, and
 - d. Provide curbs, sidewalks and landscaped area in front of the project site.
2. Widening Nohokai Street in front of the project site by 12 feet to:
 - a. Increase the public right-of-way (the widened area will be dedicated to the County);
 - b. Provide separate left and right turn lanes for turns onto South Kihei Road; and
 - c. Provide curbs, sidewalks and landscaped area in front of the project site.

In addition, an off-street interconnection between Walgreens and the adjacent McDonald's Restaurant to the south will be provided to help reduce the number of turning movements cars will need to make along South Kihei Road when patronizing either business.

The traffic assessment "with project" scenario assumes the above improvements are in place.

B. Purpose and Objective of Study

1. Determine and describe the traffic characteristics of the proposed project.
2. Quantify and document the traffic related impacts of the proposed project.
3. If required, identify and evaluate traffic related improvements required to provide adequate access to and egress from the proposed project and to mitigate the project's traffic impacts.

C. Study Approach

1. A trip generation analysis was performed to determine the scope of the traffic analysis required and the intersections to be studied. This analysis estimated that

the project could generate 49 trips during the morning peak hour and 155 trips during the afternoon peak hour. This implies that the scope of work should be a “small development: traffic impact assessment” as described by the Institute of Transportation Engineers.

The study area was defined after consultation with County of Maui Department of Public Works and review of other traffic studies for projects on the area and includes the following intersections:

- a. South Kihei Road at Lipoa Street
 - b. South Kihei Road at Piikea Avenue
 - c. South Kihei Road at McDonald’s/Longs Driveway
 - d. South Kihei Road at Nohokai Street
 - e. South Kihei Road at Kauhaa Street
 - f. South Kihei Road at Waipuilani Road
2. A field reconnaissance was performed to confirm existing roadway cross-sections, intersection lane configurations, traffic control devices, and surrounding land uses.
 3. Existing weekday morning and afternoon peak hour traffic volumes for the study intersections were obtained from manual traffic counts of the study intersections performed during May 2014. Public schools were in session during the counts.
 4. A level-of-service analysis of the study intersections was performed using the methodology described in the *Highway Capacity Manual* (HCM). The purpose of this analysis was to identify any existing traffic operating deficiencies.
 5. A list of related development projects within and adjacent to the study area that will impact traffic conditions at the study intersections was compiled. This list included both development projects and anticipated highway improvement projects.
 6. A level-of-service analysis of future traffic conditions including traffic generated by the other known developments at the study intersections without project generated traffic performed. This analysis was performed to estimate traffic operating levels-of-service and identify any operational deficiencies that may exist whether the proposed project is constructed or not. This process insures that any required mitigation improvements will be assessed against the appropriate project.
 7. Peak hour traffic volumes that the proposed project will generate were estimated using procedures described in the *Trip Generation Handbook*¹ and data provided in *Trip Generation*.² Project generated trips were distributed and assigned to the appropriate movements at the study intersections. Future traffic projections at the study intersections with project generated traffic were then estimated.
 8. The impacts of traffic generated by the proposed project at the study intersections

¹ Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., , p. 7-12

² Institute of Transportation Engineers, *Trip Generation, 8th Edition*, Washington, D.C., 2008

were quantified by analyzing the changes in peak hour traffic volumes and by performing a level-of-service analysis of future traffic conditions without and with project generated traffic.

D. Description of Existing Roadways and Intersections

[Attachment B](#) is a schematic drawing indicating the right-of-way controls and lane configurations of the study intersections. Aerial photographs of the study intersections are provided as [Attachment C](#).

Existing Roadways

South Kihei Road is a north-south collector County roadway along the eastern boundary of the project site. Generally, South Kihei Road is a two-lane roadway, but there is widening between the McDonald's/Long's driveways. The posted speed limit in the study area is 30 miles per hour.

Nohokai Street is an east-west local street along the north boundary of the project. The roadway is two lanes wide.

Existing Intersections

The intersection of South Kihei Road at Lipoa Street is a four-way, signalized intersections. The intersection is located approximately 1,260 feet south of the project. The northbound and southbound approaches are South Kihei Road. The eastbound and westbound approaches are Lipoa Street. The northbound approach has a separate left lane, one through lane and a right turn lane. The southbound approach has one left turn lane and an optional through or right turn lane. The northbound and southbound left turns are protected-permitted. The eastbound and westbound approaches each have an optional left turn or through lane and one right turn only lane. The eastbound and westbound approaches operate concurrently and the left turns are permitted.

The intersection of South Kihei Road at Piikea Avenue is a four-way, signalized intersections and is located approximately 300 feet south of the project. The northbound and southbound approaches are South Kihei Road. The westbound approach is Piikea Avenue. There is no eastbound approach. The west leg of the intersections is offset slightly to the south. This leg of the intersection is one-way westbound and is the entrance to the Post Office.

The intersection of South Kihei Road at McDonald's/Long's Driveway is located at the southern boundary of the project. The intersection is unsignalized. The eastbound and westbound approaches are the controlled approaches. The northbound and southbound approaches are South Kihei Road. The eastbound approach is the exit from McDonald's and the westbound approach is the exit from Long's Shopping Center. The northbound approach has one left turn lane, one through lane and one right turn lane. The southbound approach has one left turn lane, one through lane and an optional through or right turn lane. The eastbound and westbound approaches each have an optional through or left turn lane and one right turn lane.

The intersection of South Kihei Road at Nohokai Street is an unsignalized T-intersection. The northbound and southbound approaches are South Kihei Road. The eastbound approach is Nohokai Street and is the controlled approach. All intersection approaches are one lane each.

The intersection of South Kihei Road at Kauhaa Street is an unsignalized T-intersection. The northbound and southbound approaches are South Kihei Road and the westbound approach is Kauhaa Street. Kauhaa Street is the controlled approach. The northbound approach has an optional through or right turn lane. The southbound approach has one left turn lane and one through lane. The westbound approach has one left turn lane and one right turn lane.

The intersection of South Kihei Road at Waipuilani Road is an unsignalized, four way intersection. The northbound and southbound approaches are South Kihei Road. The eastbound and westbound approaches are Waipuilani Road and are the controlled approaches. The northbound and southbound approaches each have a separate left turn lane and an optional through or right turn lane. The eastbound and westbound approaches are each one lane.

E. Existing Peak Hour Traffic Volumes

Current weekday peak hour traffic volumes at the study intersections were obtained from manual traffic counts. The counts were performed during May 2014. The AM and PM peak hour counts are summarized on [Attachments D and E](#). The traffic counts include mopeds, motorcycles, buses, trucks and other large vehicles.

Generally, the traffic counts were performed between 6:30 AM and 8:30 AM and between 3:30 PM and 5:30 PM on either a Tuesday or Thursday. Several of the intersections were recounted and the recounts were performed on other days because of scheduling or unusual traffic conditions in or adjacent to the intersections. Counts that were performed on days other than Tuesday or Thursday were compared to counts of adjacent intersections to confirm consistency. If the counts were inconsistent, the intersection was recounted again.

Pedestrians

Pedestrians were counted concurrently with the vehicular counts. Pedestrian traffic was significant at the intersections of South Kihei Road at Lipoa Street, Piikea Avenue and the McDonald's driveway. The pedestrian volumes were not enough to have an impact on the intersections levels-of-service.

F. Public Transportation

The Maui Bus operates the Kihei Islander (Route 10) and the Kihei Villager (Route 15) along South Kihei Road, Lipoa Street and Liloa Street. There are bus stops along South Kihei Road and Lipoa Street. The nearest bus stops are along Piikea Avenue east of South Kihei Road.

G. Level-of-Service Concept

Signalized Intersections

"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 severe congestion with stop-and-go conditions. Level-of-Service D is typically considered acceptable for peak hour conditions in urban areas.³

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.

³ Institute of Transportation Engineers, *Traffic Access and Impact Studies for Site Development, A Recommended Practice*, Washington, D.C., 1991, p.39.

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	<10.0
C	Light congestion; occasional backups on critical approaches.	0.701-0.800	10.1-20.0
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	20.1-35.0
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	35.1-80.0
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.

Unsignalized Intersections

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.

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
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.

H. Existing (2014) Levels-of-Service

The existing levels-of-service of the signalized study intersections of South Kihei Road at Lipoa Street and at Piikea Street are summarized in Table 3. Volume-to-capacity ratios, delays and levels-of-service are shown for the overall intersection and each lane group. Even though level-of-service is defined by the delay, the volume-to-capacity ratios are shown as this is a factor in determining whether the traffic signal timing is a factor in estimating the level-of-service of a particular lane group.

The conclusions of the level-of-service analysis of the signalized intersections are:

1. The intersection of South Kihei Road at Lipoa Street operates at Level-of-Service B during both peak hours. All lane groups operate at Level-of-Service C, or better.
2. The intersection of South Kihei Road at Piikea Avenue operates at Level-of-Service A during both peak hours. All lane groups operate at Level-of-Service C, or better.

Table 3 Existing (2014) Levels-of-Service - Signalized Intersections

Intersection and Movement	AM Peak Hour ⁽¹⁾			PM Peak Hour ⁽²⁾		
	V/C ⁽³⁾	Delay ⁽⁴⁾	LOS ⁽⁵⁾	V/C	Delay	LOS
South Kihei Road at Lipoa Street	Cycle Length = 60 Seconds ⁽⁶⁾			Cycle Length = 60 Seconds		
	0.42	11.7	B	0.58	13.4	B
Eastbound Left & Thru	0.37	23.8	C	0.37	21.5	C
Eastbound Right	0.03	21.7	C	0.05	19.4	B
Westbound Left & Thru	0.59	28.0	C	0.65	27.3	C
Westbound Right	0.09	21.9	C	0.08	19.5	B
Northbound Left	0.06	5.4	A	0.14	6.6	A
Northbound Thru	0.39	9.0	A	0.58	11.0	B
Northbound Right	0.09	6.7	A	0.09	6.4	A
Southbound Left	0.19	3.5	A	0.19	5.9	A
Southbound Thru & Right	0.38	6.9	A	0.64	11.7	B
South Kihei Road at Piikea Avenue	Cycle Length = 60 Seconds			Cycle Length = 60 Seconds		
	0.32	6.9	A	0.51	8.5	A
Westbound Left & Thru	0.45	23.9	C	0.57	21.1	C
Westbound Right	0.06	21.5	C	0.09	17.3	B
Northbound Left	0.01	2.7	A	0.01	3.7	A
Northbound Thru	0.29	3.9	A	0.49	6.7	A
Northbound Right	0.07	2.9	A	0.11	4.1	A
Southbound Left	0.16	3.5	A	0.20	5.2	A
Southbound Thru & Right	0.18	3.2	A	0.19	4.3	A

NOTES:

- (1) See Appendix F for Level-of-Service Worksheets for existing AM peak hour traffic conditions.
- (2) See Appendix G for Level-of-Service Worksheets for existing PM peak hour traffic conditions.
- (3) Volume-to-Capacity ratio.
- (4) Delay is in seconds per vehicle.
- (5) Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
- (6) Traffic signal cycle length estimated by timing the traffic signal during peak hours.

The results of the level-of-service analysis of the unsignalized study intersections are summarized in Table 4. For the unsignalized intersections, delays and levels-of-service of the controlled lanes groups are shown. The *Highway Capacity Manual* does not estimate delays or levels-of-service of uncontrolled lane groups. Also shown in the table are the estimated queue lengths. Synchro

reports the queue lengths is feet. The queue lengths shown in the table are estimated vehicles using an average vehicle length of 25 feet.

Table 4 Existing (2014) Levels-of-Service of Unsignalized Intersections

Intersection, Approach and Movement	AM Peak Hour			PM Peak Hour		
	Delay ⁽¹⁾	LOS ⁽²⁾	95 th Queue ⁽³⁾	Delay	LOS	95 th Queue
S. Kihei Road at McDonalds/Longs Driveway	3.8	A	NC	10.9	B	NC
Eastbound Left & Thru	56.4	F	<2	296.2	F	<4
Eastbound Right	10.8	B	<1	10.4	B	<1
Westbound Left & Thru	32.5	D	<1	54.5	F	<1
Westbound Right	13.6	B	<1	17.9	C	<2
Northbound Left	8.9	A	<1	8.9	A	<1
Northbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups		
Southbound Left	8.4	A	<1	9.5	A	<1
Southbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups		
S. Kihei Road at Nohokai Road	0.4	A	NC	0.5	A	NC
Eastbound Left & Right	15.6	C	<1	19.6	C	<1
Northbound Left & Thru	0.1	A	<1	0.5	A	<1
Southbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups		
S. Kihei Road at Kauhaa Street	0.4	A	NC	0.5	A	NC
Westbound Left	19.0	C	<1	29.6	D	<1
Westbound Right	11.3	B	<1	14.1	B	<1
Northbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups		
Southbound Left	8.3	A	<1	9.2	A	<1
Southbound Thru	Uncontrolled Lane Groups			Uncontrolled Lane Groups		
S. Kihei Road at Waipuilani Road	2.6	A	NC	4.1	A	NC
Eastbound Left, Thru & Right	26.7	D	<1	46.6	E	<2
Westbound Left, Thru & Right	17.2	C	<2	29.9	D	<3
Northbound Left	8.5	A	<1	8.7	A	<1
Northbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups		
Southbound Left	8.5	A	<1	9.4	A	<1
Southbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups		

NOTES:

- (1) Delay is in seconds per vehicle.
- (2) LOS denotes Level-of-Service.
- (3) 95th percentile queue in vehicles.
- (4) NC = Not calculated

The overall intersection of South Kihei Road at McDonald's/Longs Driveway operates at Level-of-Service A during the morning peak hour and Level-of-Service B during the afternoon peak hour. The eastbound left turn and through movements operates at Level-of-Service F during both peak hours. The westbound left turn and through movements operates at Level-of-Service D during the morning peak hour and Level-of-Service F during the afternoon peak hour.

The overall intersection of South Kihei Road at Nohokai Road operates at Level-of-Service A during both peak hour. The eastbound approach operates at Level-of-Service C and the northbound left and through lane operates at Level-of-Service A.

The overall intersection of South Kihei Road at Kauhaa Street operates at Level-of-Service A during both peak hour. The westbound left turn operates at Level-of-Service C during the morning peak hour and Level-of-Service D during the afternoon peak hour. The westbound right turn operates at Level-of-Service B during both peak hour and the southbound left turn operates at Level-of-

Service A during both peak hours.

The overall intersection of South Kihei Road at Waipuilani Road operates at Level-of-Service A during both peak hours. The eastbound approach operates at Level-of-Service D during the morning peak hour and Level-of-Service E during the afternoon peak hour. The westbound approach operates at Level-of-Service C during the morning peak hour and Level-of-Service D during the afternoon peak hour. The northbound and southbound left turns operate at Level-of-Service A during both peak hours.

I. Existing Deficiencies

For signalized intersections, Level-of-Service D is the minimum acceptable Level-of-Service⁴ and that this standard is applicable to the overall intersection and major through movements. Minor movements, such as left turns, and minor side street approaches may operate at Level-of-Service E or F for short periods of time during the peak hours so that the overall intersection and major movements along the major highway will operate at Level-of-Service D, or better. All volume-to-capacity ratios must be 1.00 or less⁵.

A standard has not been established for unsignalized intersections. Therefore, we have used a standard that Level-of-Service D is an acceptable level-of-service for major controlled lane groups, such as left turns from a major street to a minor street. Side street approaches may operate at Level-of-Service E or F for short periods of time. This is determined from the delays of the individual lane groups. If the delay of any of the side street approaches appears to be so long that it will affect the overall level-of-service of the intersection, then mitigation measures should be accessed.

Using the above standards, left turns from the McDonald's driveway operates at a less than satisfactory level-of-service during the afternoon peak hour. It should be noted that this intersection was signalized in the past. The traffic signal was removed prior to 2000.

J. 2020 Background Traffic Projections

Horizon Year

The horizon year is the date for which future background traffic projections were estimated. These projections include traffic generated by other known projects within and adjacent to the study area and background traffic growth, for which a future year must be selected. For projects that will generate less than 500 peak hour trips, the suggested horizon year is the "anticipated opening year, assuming full build out and occupancy."⁶ The year 2020 is used as one of the horizon years for this TIAR.

⁴ Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development: A Recommended Practice*, 2006, page 60.

⁵ Transportation Research Board, *Highway Capacity Manual*, Washington, D.C., 2000, p. 16-35.

⁶ Institute of Transportation Engineers, *Transportation and Land Development*, Washington, D.C., 2002, page 3-13

Background Traffic Growth

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 considers traffic associated with minor, or small, projects for which no traffic data are available.

The *Maui Long Range Transportation Plan*⁷ 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 2014 and 2020, the design 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 in years

This growth factor was applied to all traffic movements at the study intersections.

Related Projects

The second component in estimating background traffic volumes is traffic generated by other known development projects, also referred to as related projects. Related projects are defined as those projects in the immediate vicinity of the study project that would significantly impact traffic in the study area. Related projects are typically projects that are under construction or have been approved for construction, but often includes adjacent vacant parcels that have a high probability of being developed within the design period. Related projects may be development projects or roadway improvements.

Two projects were identified that will have a direct impact on the study intersections. These projects and the estimated number of peak hour trips generated by each are summarized in [Table 5](#). Traffic generated by these projects was assigned to the appropriate traffic movements at the study intersections.

Table 5 Trip Generation Summary of Related Projects

Related Project	Description	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
A Downtown Kihei	18,500 sf Office 249,450 sf Retail 150 Room Hotel	363	230	133	809	393	416
B Tamura Plaza	18,330 sf Specialty Retail 4,500 sf Warehousing 1 Apartment	128	61	67	95	53	42
Totals		491	291	200	904	446	458

⁷ Kaku Associates, *Maui Long Range Land Transportation Plan*, October 1996

The growth rates above were applied to all movements at the study intersections. The resulting 2020 background traffic projections are summarized on [Attachments H and I](#).

K. Project Trip Generation

Future traffic volumes that will be generated by the proposed project were estimated using the methodology described in the *Trip Generation Handbook*⁸ and data provided in *Trip Generation*⁹. This method uses trip generation equations or rates to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent street.

The proposed action is the construction of a 14,550 square foot Walgreens Drug Store with a drive-thru window. Approximately 2,500 square feet will be used for warehousing/storage space. The remaining 12,050 square feet will be retail.

The site is currently occupied by a flea market type of retail. The flea market is not open during the morning peak hours.

Trip Generation provides rates and equations to estimate the number of peak hour trips during the peak hours of the adjacent street and the peak hours of the generator, which may or may not coincide. The AM peak hour of the adjacent street is typically between 7:00 AM and 9:00 AM and PM peak hour is between 4:00 PM and 6:00 PM, typical commute hours. *Trip Generation* does not note the peak hours of the generators. The trip generation rates and equations are based on the thousands of square feet proposed. For this project, the trip generation equations and rates for the adjacent street have been used so that the trip generation estimate will be consistent with the peak hours of the adjacent street.

The trip generation rates used for the trip generation analysis and the results are summarized in [Table 6](#). The trip generation analysis concluded that the project will generate 32 trips during the morning peak hour and 125 trips during the afternoon peak hour. Based on information provided in the *Trip Generation Handbook*, 49% of the afternoon peak hour traffic, 63 vehicles, to and from the drugstore will be pass-by trips. Accordingly, the trip generation analysis estimated that the project will generate a total of 43 new trips during the morning peak hour and 69 new trips during the afternoon peak hour. The *Trip Generation Handbook* did not provide any pass-by trip information for the morning peak hour.

⁸ Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 2004, p. 7-12

⁹ Institute of Transportation Engineers, *Trip Generation, 8th Edition*, Washington, D.C., 2003

Table 6 Trip Generation Analysis

Period & Direction		Pharmacy/Drugstore With Drive Thru (Land Use Code 881)					Warehousing (Land Use Code 150)			TOTAL NEW TRIPS
		Trips per Unit or Percent ^{(1),(2)}	TGSF	Trips	Pass-By Trips	Net New Trips	Trips per Unit or Percent ^{(1),(2)}	TGSF	Trips	
AM Peak Hour of Adjacent Street	Total	2.66	12.050	32	0	32	$\text{Ln}(T) = 0.55\text{Ln}(A) + 1.88$	2.500	11	43
	In	57%		18	0	18	79%		9	27
	Out	43%		14	0	14	21%		2	16
PM Peak Hour of Adjacent Street	Total	10.35		125	62	63	$\text{Ln}(T) = 0.64\text{Ln}(A) + 1.14$		6	69
	In	50%		63	31	32	25%		2	34
	Out	50%		62	31	31	75%		4	35

Notes:

- (1) Source: Institute of Transportation Engineers, *Trip Generation 8th Edition*, 2008
 (2) T=trips, X=number of dwelling units, TGSF = Thousand Gross Square Feet

Project trips were distributed and assigned based on existing traffic patterns as estimated from the traffic counts, specifically retail traffic into and out of the Long's Driveway. The trip distribution pattern based on existing traffic patterns in the study area is summarized in [Table 7](#). The resulting traffic assignments are shown as [Attachments L and M](#).

Table 7 Trip Distribution

To/From	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
South Kihei Road North	30%	40%	30%	45%
Waipuilani Road West	5%	5%	5%	5%
Waipuilani Road East	20%	15%	15%	15%
Kauhaa Street East	15%	15%	15%	15%
Piikea Avenue East	5%	5%	5%	5%
Lipoa Street East	5%	5%	5%	5%
South Kihei Road South	20%	15%	25%	10%
Totals	100%	100%	100%	100%

L. Background Plus Project Projections

Background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the 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 assumes that the peak hours of the intersections coincide with the peak hour of the study project. The resulting background plus project peak hour traffic projections are shown in [Attachment N and O](#).

M. Traffic Impact Assessment

The traffic impacts of the project was assessed by analyzing the changes in traffic volumes and levels-of-service at the study intersections. The "with project" scenario assumes the improvements

described in Section A and shown on Attachment A are in place. The “without project” scenario assumes the improvements are not in place.

Changes in Total Intersection Volumes

An analysis of the project’s share of 2020 background plus project intersection approach volumes at the study intersections is summarized in [Table 8](#). The table summarizes the project’s share of total 2020 peak hour approach volumes at each intersection. Also shown are the percentages of 2020 background plus project traffic that is the result of background growth and traffic generated by related projects.

Table 8 Analysis of Project’s Share of Total Intersection Approach Volumes ⁽¹⁾

Intersection	Period	2014 Existing	2020 Background	2020 Background Plus Project	Background Growth		Project Traffic	
					Trips	Percent of Total Traffic ⁽²⁾	Trips	Percent of Total Traffic ⁽²⁾
S. Kihei Road at Lipoa Street	AM	1412	1628	1637	216	13.2%	9	0.5%
	PM	1857	2197	2214	340	15.4%	17	0.8%
S. Kihei Road at Piikea Avenue	AM	1191	1412	1424	221	15.5%	12	0.8%
	PM	1513	1904	1923	391	20.3%	19	1.0%
S. Kihei Road at McDonalds/Longs	AM	1200	1358	1370	158	11.5%	12	0.9%
	PM	1426	1624	1643	198	12.1%	19	1.2%
S. Kihei Road at Nohokai Street	AM	1010	1179	1210	169	14.0%	31	2.6%
	PM	1288	1507	1557	219	14.1%	50	3.2%
S. Kihei Road at Kauhaa Street	AM	959	1122	1153	163	14.1%	31	2.7%
	PM	1300	1518	1568	218	13.9%	50	3.2%
S. Kihei Road at Waipuulani Road	AM	1115	1276	1299	161	12.4%	23	1.8%
	PM	1444	1658	1698	214	12.6%	40	2.4%

Notes:

- (1) Volumes shown are total intersection approach volumes or projections.
- (2) Percentage of total 2020 background plus project traffic.
- (3) Data to be provided in final draft report.

Level-of-Service Analysis

The level-of-service analysis was performed for “without project” and “with project” conditions. The incremental difference the two conditions quantifies the impacts of the project generated traffic. The lane configurations and right-of-way controls used in the level-of-service analysis are shown on [Attachment P](#).

The results of the level-of-service analysis of the signalized study intersections are summarized in [Table 9](#). Even though the level-of-service is defined by delay, the volume-to-capacity ratios are shown as it is a factor used to determine whether the delay of a particular traffic movement, or lane group, is the result of the traffic signal timing or the result of a capacity deficiency. The level-of-service analysis also used the existing traffic signal timing plan to assess future conditions.

The conclusions of the level-of-service analysis of the signalized intersections are:

1. The intersection of South Kihei Road at Lipoa Street will operate at Level-of-Service B during both peak hours without and with project traffic. The northbound through

movement along South Kihei Road will operate at Level-of-Service B during both peak hours. The southbound through movement along South Kihei Road will operate at Level-of-Service A during the morning peak hour and Level-of-Service B during the afternoon peak hour without and with project traffic. All lane groups will operate at Level-of-Service C, or better, and there is no change in the level-of-service of any lane group as a result of project traffic.

Mitigation is not required.

- The intersection of South Kihei Road at Piikea Avenue will operate at Level-of-Service A during the morning peak hour and Level-of-Service B during the afternoon peak hour, without and with project traffic. The northbound and southbound through movement along South Kihei Road will operate at Level-of-Service A during both peak hours, without and with project traffic. There is no change in the level-of-service of any lane group as a result of project traffic.

Mitigation is not required.

Table 9 2020 Levels-of-Service - Signalized Intersections

Intersection and Movement	AM Peak Hour ⁽¹⁾						PM Peak Hour ⁽²⁾					
	Without Project			With Project			Without Project			With Project		
	V/C ⁽³⁾	Delay ⁽⁴⁾	LOS ⁽⁵⁾	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
South Kihei Road at Lipoa Street	Cycle Length = 60 Seconds ⁽⁵⁾						Cycle Length = 60 Seconds					
	0.48	11.9	B	0.53	12.0	B	0.70	16.8	B	0.70	17.0	B
Eastbound Left & Thru	0.34	22.4	C	0.34	22.5	C	0.40	22.2	C	0.39	22.0	C
Eastbound Right	0.04	20.5	C	0.04	20.6	C	0.05	19.8	B	0.05	19.6	B
Westbound Left & Thru	0.55	25.3	C	0.56	25.4	C	0.66	28.7	C	0.66	28.4	C
Westbound Right	0.10	20.8	C	0.10	21.0	C	0.08	20.0	B	0.09	19.8	B
Northbound Left	0.07	5.9	A	0.07	5.9	A	0.22	9.0	A	0.22	9.1	A
Northbound Thru	0.49	10.5	B	0.50	10.5	B	0.73	15.2	B	0.75	15.7	B
Northbound Right	0.10	7.0	A	0.10	7.0	A	0.10	6.9	A	0.10	6.9	A
Southbound Left	0.26	4.6	A	0.26	4.7	A	0.30	8.0	A	0.32	8.2	A
Southbound Thru & Right	0.46	8.2	A	0.46	8.2	A	0.81	17.6	B	0.81	17.8	B
South Kihei Road at Piikea Avenue	Cycle Length = 60 Seconds						Cycle Length = 60 Seconds					
	0.38	6.9	A	0.39	6.9	A	0.61	10.7	B	0.61	10.8	B
Westbound Left & Thru	0.52	22.8	C	0.52	22.6	C	0.70	23.6	C	0.70	23.6	C
Westbound Right	0.07	19.8	B	0.07	19.6	B	0.12	16.1	B	0.13	16.1	B
Northbound Left	0.02	2.8	A	0.02	2.8	A	0.02	4.7	A	0.02	4.7	A
Northbound Thru	0.35	4.4	A	0.35	4.4	A	0.56	9.0	A	0.57	9.1	A
Northbound Right	0.10	3.1	A	0.10	3.2	A	0.18	5.6	A	0.18	5.6	A
Southbound Left	0.22	4.1	A	0.23	4.1	A	0.41	9.5	A	0.42	9.9	A
Southbound Thru & Right	0.21	3.4	A	0.21	3.4	A	0.23	5.6	A	0.23	5.6	A

NOTES:

- See Appendix J for Level-of-Service Worksheets for 2020 AM peak hour traffic conditions without project.
- See Appendix K for Level-of-Service Worksheets for 2020 PM peak hour traffic conditions without project.
- See Appendix Q for Level-of-Service Worksheets for 2020 AM peak hour traffic conditions with project.
- See Appendix R for Level-of-Service Worksheets for 2020 PM peak hour traffic conditions with project.
- Volume-to-Capacity ratio.
- Delay is in seconds per vehicle.
- Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

The results of the level-of-service analysis of the unsignalized intersections are summarized in Table 10. Shown are the delays and levels-of-service of the overall intersection and each controlled lane group. The methodology for unsignalized intersections does not estimate delays and levels-of-service for uncontrolled movements. Also shown in the table are the estimated queue lengths without and with project generated traffic. Synchro reports the queue lengths in feet. The queue lengths shown in the table are estimated vehicles using an average vehicle length of 25 feet.

Table 10 2020 Levels-of-Service - Unsignalized Intersections

Intersection, Approach and Movement	AM Peak Hour						PM Peak Hour					
	Without Project			With Project			Without Project			With Project		
	Delay ⁽¹⁾	LOS ⁽²⁾	95 th Queue ⁽³⁾	Delay	LOS	95 th Queue	Delay	LOS	95 th Queue	Delay	LOS	95 th Queue
S. Kihei Road at McDonalds/Longs Driveway	3.6	A	NC	4.8	A	NC	23.7	C	NC	25.9	C	NC
Eastbound Left & Thru	98.8	F	<3	104.2	F	<3	872.0	F	<6	976.8	F	<6
Eastbound Right	11.3	B	<1	11.3	B	<1	10.9	B	<1	11.0	B	<1
Westbound Left & Thru	42.1	E	<1	43.1	E	<1	97.1	F	<2	104.8	F	<2
Westbound Right	15.4	C	<1	15.6	C	<1	23.7	C	<2	24.6	C	<2
Northbound Left	9.3	A	<1	9.3	A	<1	9.3	A	<1	9.3	A	<1
Northbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups		
Southbound Left	8.7	A	<1	8.8	A	<1	10.3	B	<1	10.5	B	<1
Southbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups		
S. Kihei Road at Nohokai Road	0.4	A	NC	0.3	A	NC	0.6	A	NC	0.4	A	NC
Eastbound Left & Right	18.2	C	<1				27.9	D	<1			
Eastbound Left				26.2	D	<1				57.5	F	<1
Eastbound Right				13.7	B	<1				14.3	B	<1
Northbound Left & Thru	0.1	A	<1	9.1	A	<1	0.5	A	<1	9.4	A	<1
Southbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups		
S. Kihei Road at Kauhaa Street	0.3	A	NC	0.4	A	NC	0.5	A	NC	0.7	A	NC
Westbound Left	23.0	C	<1	24.2	C	<1	40.0	E	<1	44.8	E	<1
Westbound Right	12.0	B	<1	12.1	B	<1	15.7	C	<1	16.2	C	<1
Northbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups		
Southbound Left	8.6	A	<1	8.6	A	<1	9.7	A	<1	9.8	A	<1
Southbound Thru	Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups		
S. Kihei Road at Waipuilani Road	2.8	A	NC	3.1	A	NC	5.7	A	NC	7.6	A	NC
Eastbound Left, Thru & Right	25.7	E	<1	36.3	E	<1	82.9	F	<2	88.8	F	<3
Westbound Left, Thru & Right	20.9	C	<2	23.7	C	<2	48.6	E	<4	89.7	F	<5
Northbound Left	8.8	A	<1	8.8	A	<1	9.1	A	<1	9.2	A	<1
Northbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups		
Southbound Left	8.7	A	<1	8.8	A	<1	9.9	A	<1	10.0	B	<1
Southbound Thru & Right	Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups			Uncontrolled Lane Groups		

NOTES:
 (1) Delay is in seconds per vehicle.
 (2) LOS denotes Level-of-Service.
 (3) 95th percentile queue in vehicles.
 (4) NC = Not calculated

The conclusions of the level-of-service analysis of the unsignalized intersections are:

1. The overall intersection of South Kihei Road at McDonald's/Longs Driveway will operate at Level-of-Service A during the morning peak hour and Level-of-Service C during the afternoon peak hour, without and with project traffic. The eastbound left and through movement will operate at Level-of-Service F during both peak

hours, without and with project traffic. The westbound left and through movement will operate at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour, without and with project traffic. The delay of the eastbound left and through movement is long enough to affect the overall intersection level-of-service.

Mitigation should be assessed, but not because of project generated traffic.

2. The overall intersection of South Kihei Road at Nohokai Street will operate at Level-of-Service A during both peak hours, without and with project traffic. The eastbound left turn will operate at Level-of-Service F during the afternoon peak hour, but the delay is not long enough to affect the overall intersection level-of-service.

Mitigation is not required.

3. The overall intersection of South Kihei Road at Kauhaa Street will operate at Level-of-Service A during both peak hours, without and with project traffic. The westbound left turn will operate at Level-of-Service E during the afternoon peak hour, without and with project traffic, but the delays is not long enough to affect the overall intersection level-of-service.

Mitigation is not required.

4. The overall intersection of South Kihei Road at Waipuilani Road will operate at Level-of-Service A during both peak hours, without and with project traffic. The eastbound approach will operate at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour, without and with project traffic. The westbound approach will operate at Level-of-Service C during the morning peak hour, without and with project traffic. During the afternoon peak hour, the westbound approach will operate at Level-of-Service E without project traffic and Level-of-Service F without project traffic. The delays of the eastbound and westbound approaches are not enough to affect the overall intersection level-of-service as the intersection will operate at Level-of-Service A, without and with project traffic.

Mitigation is not required.

Project Driveway Along South Kihei Road

The results of the level-of-service analysis of the intersection of South Kihei Road at the project's driveways are summarized in [Table 11](#). The level-of-service analysis assumed that the driveways will be unsignalized. All movements will be allowed. Since the driveway will be unsignalized, delays, levels-of-service and 95th percentile queues are shown. The level-of-service analysis concluded that the driveway will operate at Level-of-Service A during both peak hours. This implies good operating conditions, minimal delays and high levels-of-service at the project driveways.

Table 11 2018 Levels-of-Service - Project Driveways

Approach and Lane Group	AM Peak Hour			PM Peak Hour		
	Delay ⁽¹⁾	LOS ⁽²⁾	95 th Queue ⁽³⁾	Delay	LOS	95 th Queue
S. Kihei Rd at Project Driveway	0.3	A	NC	1.5	A	NC
Eastbound Left	17.3	C	<1	28.3	D	<1
Eastbound Right	13.2	B	<1	14.5	B	<1
Northbound Left	0.3	A	<1	1.0	A	<1

NOTES:

- (1) Delay is in seconds per vehicle.
- (2) LOS denotes Level-of-Service.
- (3) 95th Percentile as reported by Synchro. Assumed vehicle length is 25 feet.
- (4) See [Attachments Q and R](#) for Level-of-Service Worksheets.
- (5) NC = Not Calculated

O. Mitigation

As noted earlier, Level-of-Service D is the minimum acceptable Level-of-Service¹⁰ for signalized intersections and that this standard is applicable to the overall intersection rather than each controlled lane group. Minor movements, such as left turns, and minor side street approaches may operate at Level-of-Service E or F for short periods of time during the peak hours so that the overall intersection and major movements along the major highway will operate at Level-of-Service D, or better. All volume-to-capacity ratios must be 1.00 or less¹¹.

No mitigation is required at the signalized intersections.

A standard has not be established for unsignalized intersections. Therefore, we have used a standard that Level-of-Service D is an acceptable level-of-service for any major controlled lane groups, such as left turns from a major street to a minor street. Side street approaches may operate at Level-of-Service E or F for short periods of time. This is determined from the delays of he individual lane groups. If the delay of any of the side street approaches appears to be so long that it will affect the overall level-of-service of the intersection, then mitigation measures should be accessed.

Mitigation should be assessed for the intersection of South Kihei Road at McDonald's/Longs Driveway. The delays of the eastbound left and through movement and the westbound left and through movement are long and affect the overall intersection level-of-service. Typically, the construction of traffic signals would be assessed. However, the intersection is 300 feet (center to center) from the intersection of South Kihei Road at Piikea Avenue. This distance is less than the minimum recommended distance between signalized intersections. Distances less than 300 feet do not allow sufficient distance to accommodate vehicle queues resulting in traffic backing up through the adjacent intersections. Therefore, traffic signals would mitigate the long delays to the side street approaches but would result in greater congestion to the northbound and southbound

¹⁰ Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development: A Recommended Practice*, 2006, page 60.

¹¹ Transportation Research Board, *Highway Capacity Manual*, Washington, D.C., 2000, p. 16-35.

traffic along South Kihei Road. Accordingly, traffic signals are not recommended for this intersection.

It should also be noted that this intersection was signalized in the past. The traffic signals were removed prior to 2000.

P. Summary and Recommendations

1. The proposed action is the construction of a 14,550 square foot Walgreens Drug Store with a drive-thru window in the southwest quadrant of the intersection of South Kihei Road at Nohokai Street in Kihei. The site is currently occupied by a flea market type of retail. The flea market is not open during the morning peak hours.
2. Access to and egress from the site will be provided by two new driveways. The primary access will be provided by a new driveway along the west side of South Kihei Road, approximately midway between the McDonald's driveway and Nohokai Street. The intersection will be unsignalized and all traffic movements will be allowed. The median along South Kihei Road will be modified to provide a two-way left turn lane up to Nohokai Street as described in Section A and shown on Attachment A. The second driveway will be along the south side of Nohokai Street at the west end of the project site. Only right turns will be allowed out of this driveway. The Nohokai Street approach to South Kihei Road will be modified to provide separate left and right turn lanes as described in Section A and shown on Attachment A.
3. The trip generation analysis concluded that the project will generate 43 new trips during the morning peak hour and 69 new trips during the afternoon peak hour.
4. The level-of-service analysis concluded the following:
 - a. The intersection of South Kihei Road at Lipoa Street will operate at Level-of-Service B during both peak hours without and with project traffic. The northbound through movement along South Kihei Road will operate at Level-of-Service B during both peak hours. The southbound through movement along South Kihei Road will operate at Level-of-Service A during the morning peak hour and Level-of-Service B during the afternoon peak hour without and with project traffic. All lane groups will operate at Level-of-Service C, or better, and there is no change in the level-of-service of any lane group as a result of project traffic. Mitigation is not required.
 - b. The intersection of South Kihei Road at Piikea Avenue will operate at Level-of-Service A during the morning peak hour and Level-of-Service B during the afternoon peak hour, without and with project traffic. The northbound and southbound through movements along South Kihei Road will operate at Level-of-Service A during both peak hours, without and with project traffic. There is no change in the level-of-service of any lane group as a result of project traffic. Mitigation is not required.
 - c. The overall intersection of South Kihei Road at McDonald's/Longs Driveway will operate at Level-of-Service A during the morning peak hour and Level-of-Service C during the afternoon peak hour, without and with project traffic. The eastbound left and through movement will operate at Level-of-Service F during both peak

hours, without and with project traffic. The westbound left and through movement will operate at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour, without and with project traffic. The delay of the eastbound left and through movement is long enough to affect the overall intersection level-of-service. No mitigation is recommended because of the proximity of the intersection to the intersection of South Kihei Road at Piikea Avenue.

- d. The overall intersection of South Kihei Road at Nohokai Street will operate at Level-of-Service A during both peak hours, without and with project traffic. The eastbound left turn will operate at Level-of-Service F during the afternoon peak hour, but the delay is not long enough to affect the overall intersection level-of-service. Mitigation is not required.
 - e. The overall intersection of South Kihei Road at Kauhaa Street will operate at Level-of-Service A during both peak hours, without and with project traffic. The westbound left turn will operate at Level-of-Service E during the afternoon peak hour, without and with project traffic, but the delays is not long enough to affect the overall intersection level-of-service. Mitigation is not required.
 - f. The overall intersection of South Kihei Road at Waipuilani Road will operate at Level-of-Service A during both peak hours, without and with project traffic. The eastbound approach will operate at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour. The westbound approach will operate at Level-of-Service C during the morning peak hour, without project traffic. The eastbound approach will operate at Level-of-Service E without project traffic and Level-of-Service F without project traffic. The delays of the eastbound and westbound approaches are not enough to affect the overall intersection level-of-service as the intersection will operate at Level-of-Service A, without and with project traffic. Mitigation is not required.
5. The level-of-service analysis concluded that the project's driveway along South Kihei Road will operate at Level-of-Service A during both peak periods.
 6. Adequate off-street loading/unloading facilities should be provided.
 7. No parking should be allowed along South Kihei Road or Nohokai Street.

Mr. Jeffrey A. Benner
March 27, 2015
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8. During construction, delivery of construction related materials should be scheduled for off-peak hours. Typical peak traffic periods are from 6:30 AM to 9:00 AM and from 3:00 PM to 6:00 PM.
9. Parking for construction workers should be provided on-site. No construction related parking should be allowed along South Kihei Road or Nohokai Street.

Respectfully submitted,
PHILLIP ROWELL AND ASSOCIATES

A handwritten signature in black ink, appearing to read "P. Rowell". The signature is fluid and cursive, with the first letter of the first name being a large, stylized 'P'.

Phillip J. Rowell, P.E.
Principal

APPENDIX **F**

Preliminary Engineering Report

Established 1969

Preliminary Engineering Report

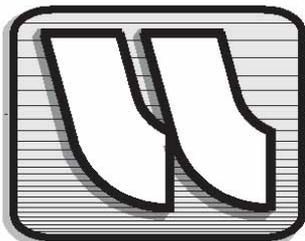
WALGREENS KIHEI

Kihei, Maui, Hawaii

TMK: (2) 3-9-07: 37, 38, 39, 40 and
(2) 3-9-08: 16

Prepared For:

Walgreens of Maui, Inc.
106 Wilmot Road
Deerfield, IL 60015



WARREN S. UNEMORI ENGINEERING, INC.

Civil and Structural Engineers – Land Surveyors
Wells Street Professional Center – Suite 403
2145 Wells Street
Wailuku, Maui, Hawaii 96793

March 17, 2015

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**Preliminary Engineering Report
for
Walgreens Kihei**

1. INTRODUCTION

1.1 Purpose

Walgreen of Maui, Inc., is seeking a Special Management Area Permit and Change in Zoning to build a new store on 2 acres of land in Kihei. This report describes and assesses the existing infrastructure in the vicinity of the project and identifies the improvements needed to support the proposed use.

1.2 Project Location

The 2.015 acre project site¹ occupies the southwest corner of the South Kihei Road / Nohokai Street intersection. The site is bounded by Nohokai Street to the north, South Kihei Road to the east, a McDonald's restaurant to the south, and residential houselots to the west. (See Figure 1-1).

1.3 Further Permit Approvals Required

If the project is successful in obtaining a Change In Zoning and Special Management Area Use Permit, the following permits will also be needed to be obtained in order to construct the proposed development.

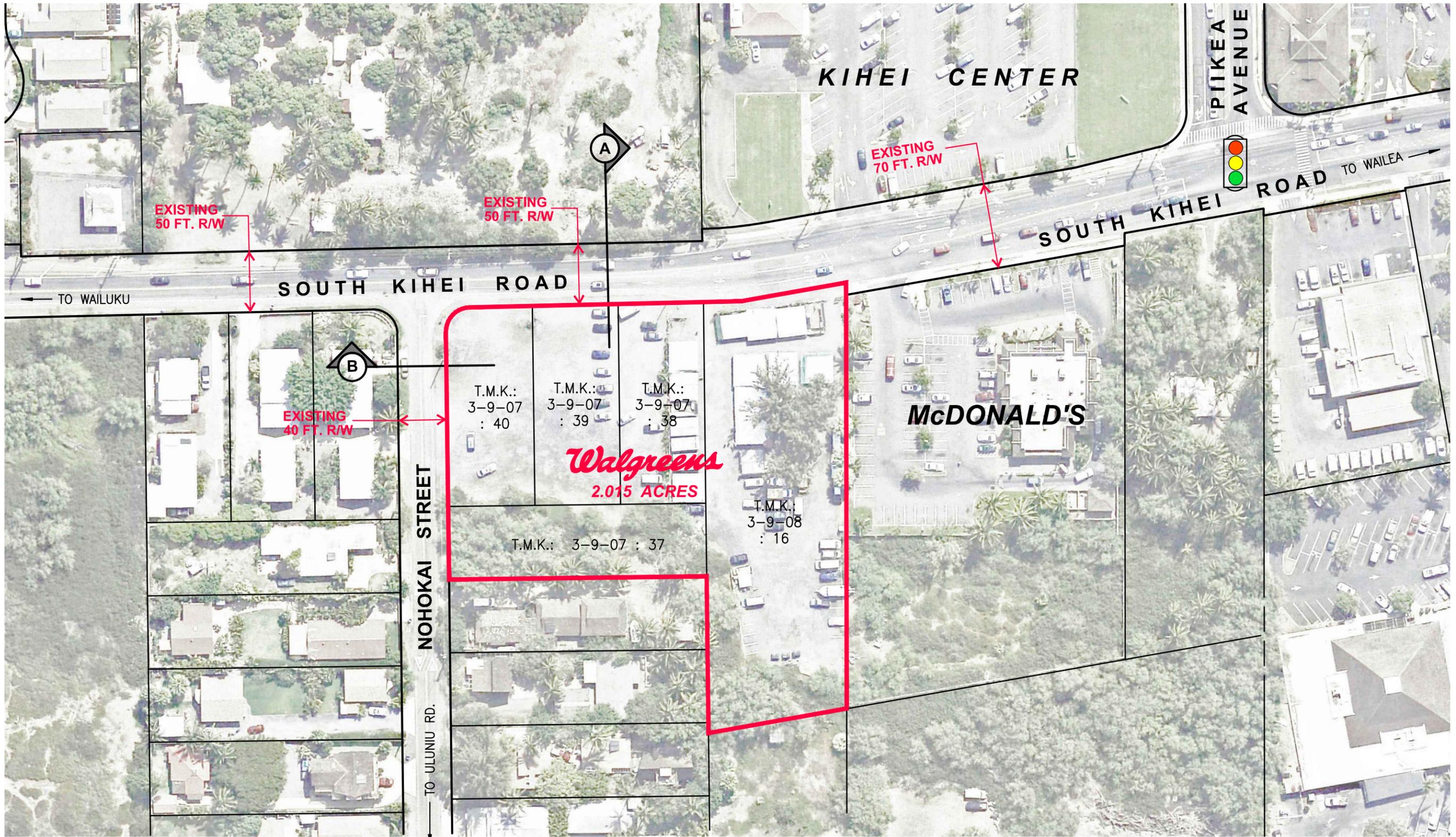
¹ The site is comprised of five separate land parcels designated Lots 9-A-23, 9-A-24, 9-A-25, 9-A-26, and Lot 9 of the Waiohuli-Keokea Beach Lots at Tax Map Key (2) 3-9-07: 37, 38, 39, 40 and TMK (2) 3-9-08: 16.

- a) *Subdivision* approval from the Maui County Department of Public Works to consolidate the five separate parcels comprising the project site into a single lot and create a separate roadway widening lot which can be dedicated to the County of Maui;²
- b) *A Special Flood Hazard Area Development Permit* from the Maui County Department of Planning;³
- c) *A Building Permit* from the Maui County Department of Public Works;
- d) *A Grading Permit* from the Maui County Department of Public Works;
- e) *A Work on County Highway Permit* from the Maui County Department of Public Works; and
- f) *A National Pollutant Discharge Elimination System (NPDES) Permit* for stormwater discharge during construction from the State of Hawaii Department of Health, Clean Water Branch.

² Roadway widening is discussed in Section 2.2 of this report.

³ The need for a *Special Flood Hazard Area Development Permit* is discussed in Section 3.2.1 of this report.

TRUE NORTH
SCALE: 1 IN. = 80 FT.



NOTE:
EXISTING STREET SECTIONS ARE SHOWN
ON FIGURES 2-2a AND 2-2b.

FIGURE 1-1
Project Site

V:\Projdata\14proj\14003 Walgreens Kihei\dwg\exhibits\Eng_Report\Conceptual Plan-00.dwg

2. ROADWAY IMPROVEMENTS

2.1 Existing Conditions

South Kihei Road is a County-owned collector roadway which provides the primary access route to the project site. The existing portion of South Kihei Road which fronts the project site is currently a two lane roadway with paved shoulders but no curbs, sidewalks or storm drainage facilities, located within a 50-foot wide right-of-way. (See Figure 2-2a) Nohokai Street is a two-lane County-owned minor street providing local access into the residential area west of South Kihei Road. It currently consists of two paved vehicle lanes with no curbs, sidewalks or storm drainage facilities.

(See Figure 2-2b)

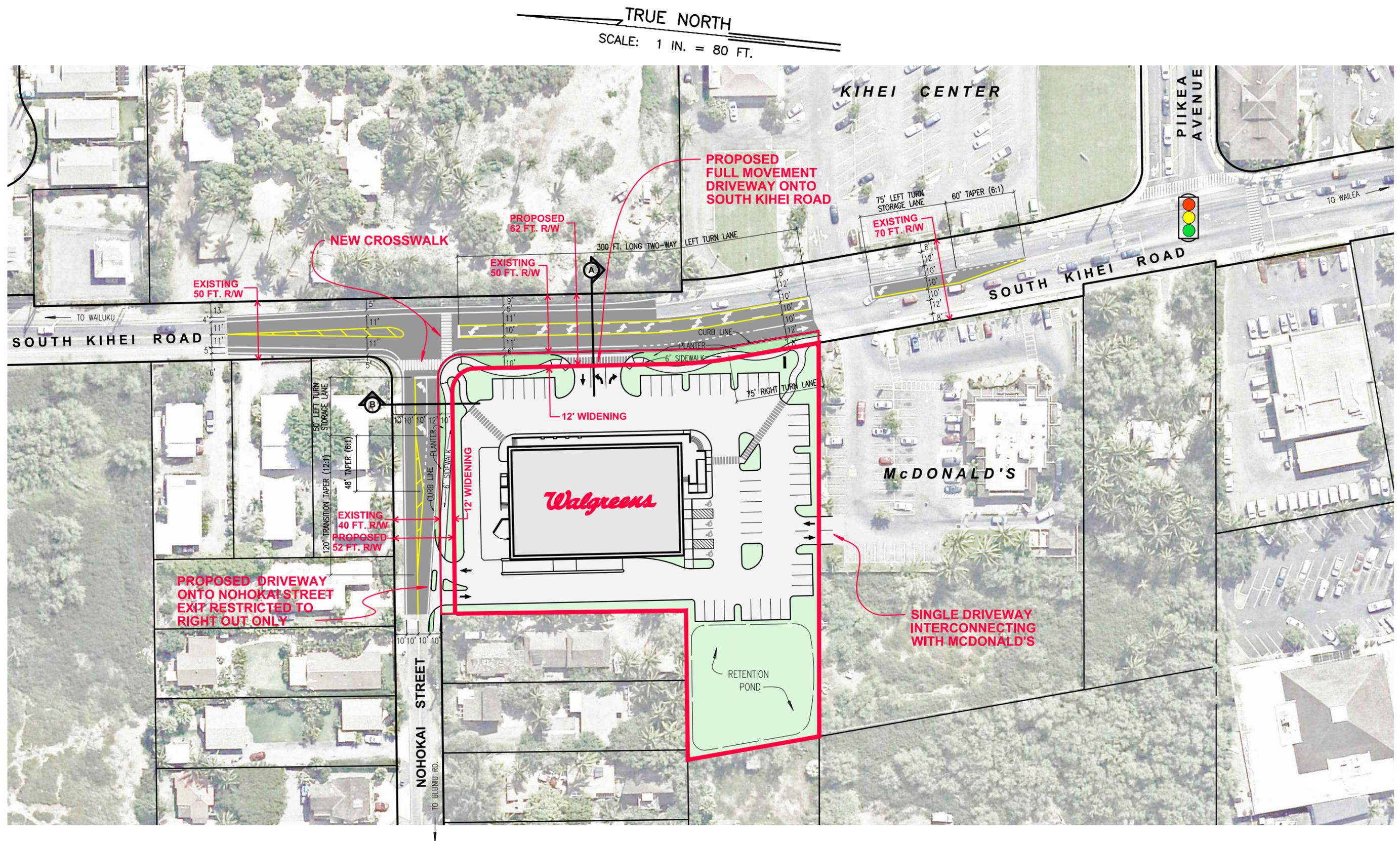
2.2 Proposed Improvements

Development of the Kihei Walgreens store will include vehicle capacity and pedestrian facility upgrades along the project site's South Kihei Road and Nohokai Street frontages to make them compliant with both the Maui County Dept. of Public Works' roadway standards for commercial uses and Maui County's "Complete Streets" bike and pedestrian facilities policy. (See Figures 2-1 and 2-2) More specifically, these improvements will include:

- 1) Widening South Kihei Road in front of the project site by 12 feet to:
 - a) Increase the public right-of-way (the widened area will be dedicated to the County;

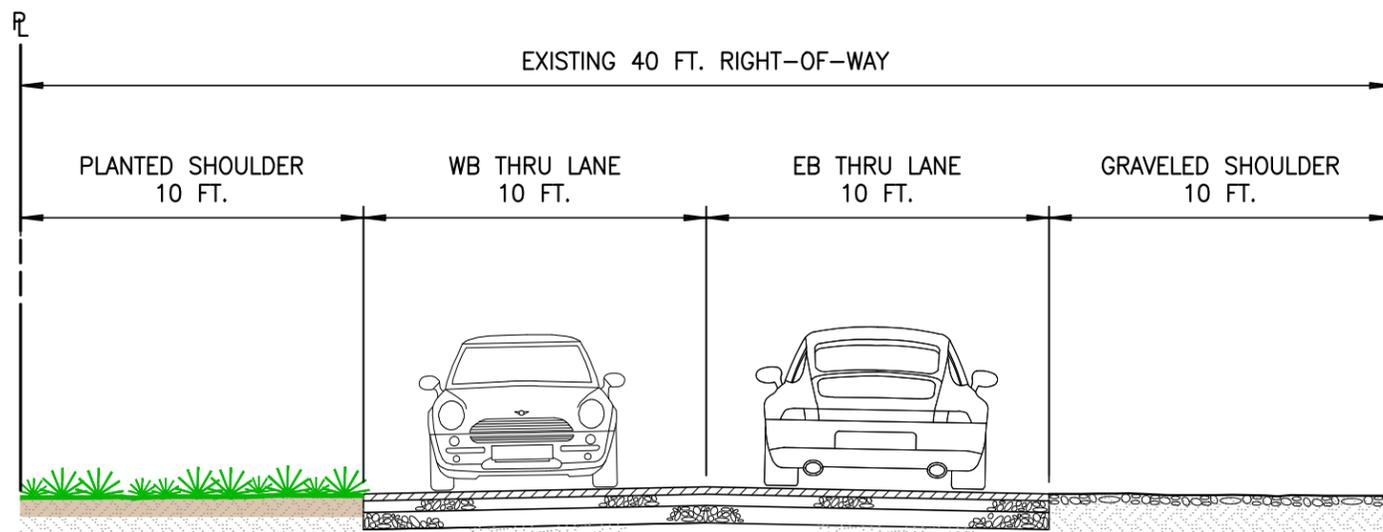
- b) Provide a striped median along South Kihei Road to accommodate a two-way left turn lane up to Nohokai Street; this striped median will allow for left turns into the Walgreens driveway and onto Nohokai Street;
 - c) Provide bike lanes on both sides of South Kihei Road; and
 - d) Provide curbs, sidewalks, and a landscaped area in front of the site.
- 2) Widening Nohokai Street in front of the project site by 12 feet to:
- a) Increase the public right-of-way (the widened area will be dedicated to the County);
 - b) Provide separate left and right turn lanes for turns onto South Kihei Road; and
 - c) Provide curbs, sidewalks, and a landscaped area in front of the site.

An off-street interconnection between Walgreens and the adjacent McDonald's restaurant to the south will also be made to help reduce the number of turning movements cars will need to make on South Kihei Road when patronizing either business.

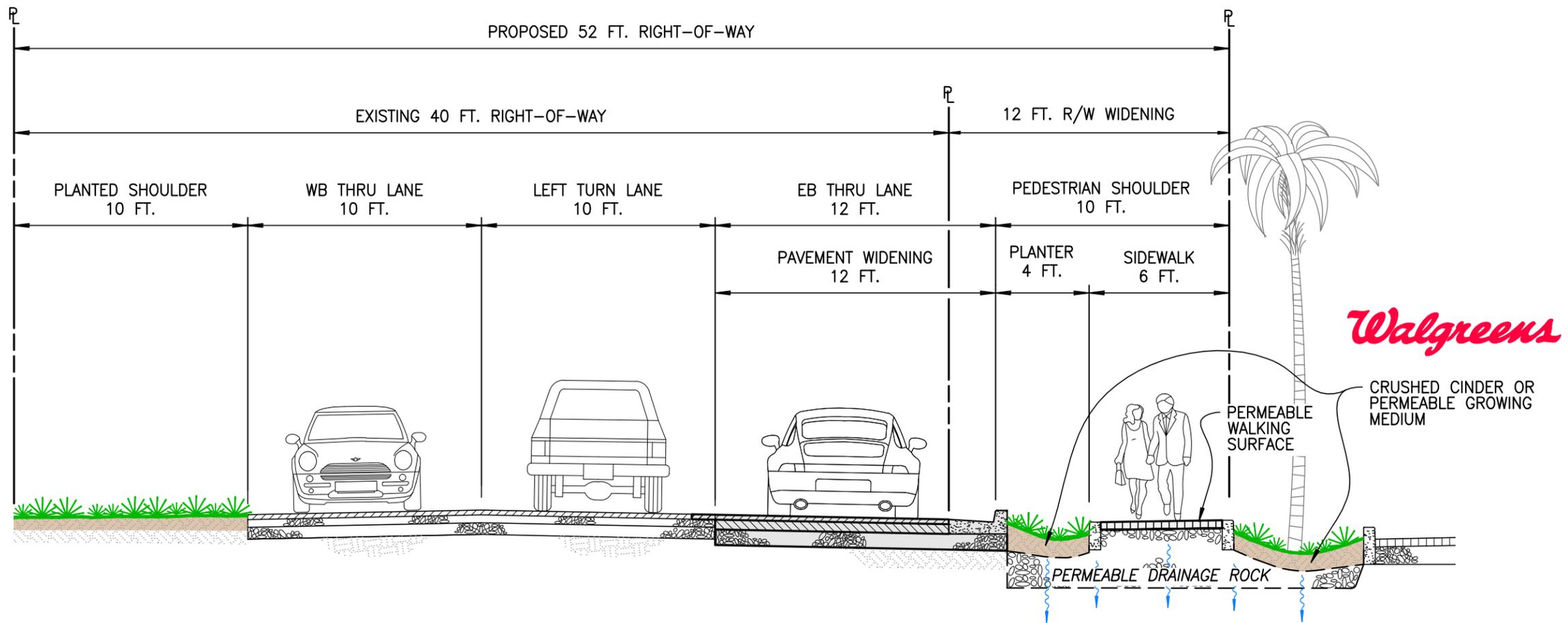


NOTE:
PROPOSED STREET SECTIONS ARE SHOWN
ON FIGURES 2-2a AND 2-2b.

FIGURE 2-1
Right-of-Way Widening and
Street Frontage Improvements

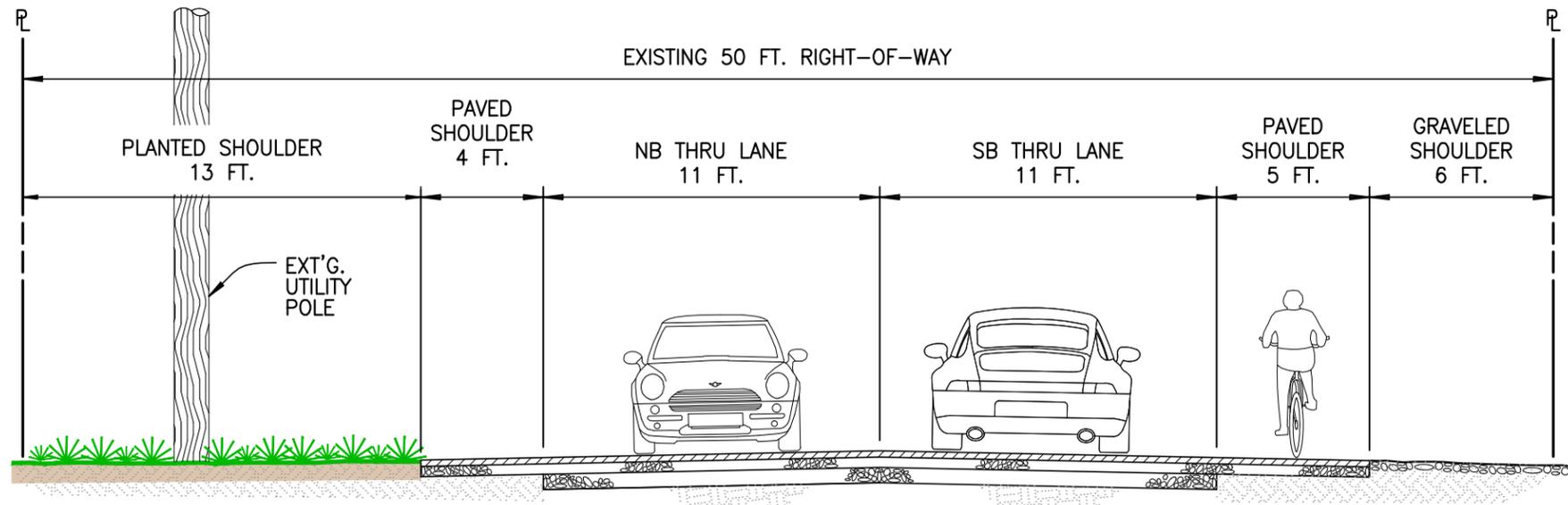


EXISTING NOHOKAI STREET SECTION

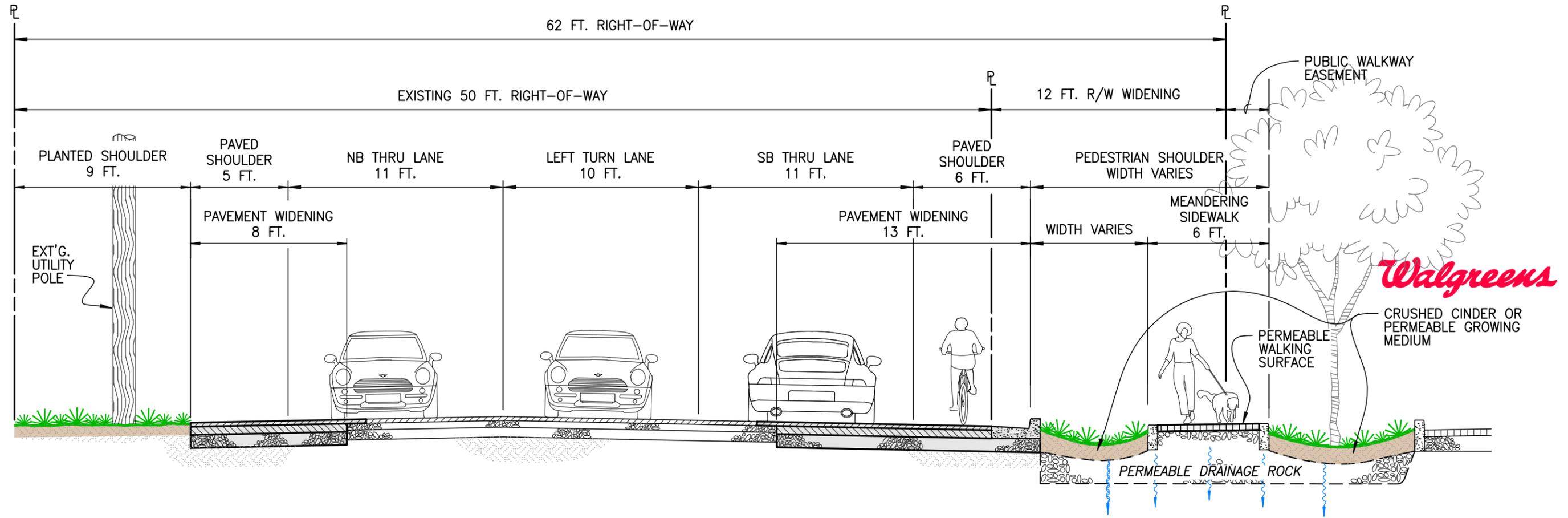


PROPOSED NOHOKAI STREET SECTION

FIGURE 2-2b
Nohokai Street Cross Sections



EXISTING SOUTH KIHAI ROAD SECTION



PROPOSED SOUTH KIHAI ROAD SECTION

FIGURE 2-2a
South Kihei Road Cross Sections

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3. STORM DRAINAGE

3.1 Existing Conditions

3.1.1 Topography and Soil Conditions

The project site is currently a graveled parking lot with trees and brush along its western edge. The site is low and flat, with elevations across the site ranging between 4 feet to 6 feet above mean sea level. Groundwater has been reported present at depths ranging between 1.4 feet and 3 feet below the existing ground surface.⁴ The USDA Natural Resources Conservation Service identifies the predominant soil type underlying the project site as Jaucas Sand (JcC),⁵ which consist of excessively drained, calcareous soils that occur as narrow strips on coastal plains adjacent to the ocean.⁶ (See Figure 3-1).

3.1.2 Flood and Tsunami Zone

The FEMA Flood Insurance Rate Map⁷ for the area places the entire project site within Zone AH (EL 6), a Special Flood Hazard Area subject to 100-year flooding with a Base Flood Elevation of 6 feet. (See Figure 3-2)

⁴ Island Geotechnical Engineering, Inc., “Soils Investigation Report for Walgreens Kihei,” November 30, 2013, page 2.

⁵ United States Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, August 1972, pp. 48-49, 158-159, Maps 102 and 107.

⁶ Island Geotechnical Engineering, Inc., “Soils Investigation Report for Walgreens Kihei,” November 30, 2013, page 3.

⁷ U.S. Department of Homeland Security, Federal Emergency Management Agency, National Flood Insurance Program, “Flood Insurance Rate Map, Maui County, Hawaii,” Map Number 1500030586F, September 19, 2012.

3.1.3 Existing Drainage Condition

Onsite Runoff

In its present undeveloped condition, the 2-acre project site generates approximately 3.2 cfs of surface runoff during a 50-year 1-hour storm.⁸ This runoff currently drains to the southwest across the project site, then through the adjoining residential lands on its way to the ocean. (See Figure 3-3)

Offsite Runoff

The absence of storm drainage collection and disposal infrastructure along South Kihei Road or Nohokai Street results in a significant, but undetermined, amount of runoff from these roads and the lands discharging onto them draining through the project site on its way to the ocean. Figure 3-3 illustrates the path which this offsite runoff now takes through the project site.

3.2 Drainage Plan

3.2.1 Compliance with Flood Hazard Area Regulations

The project site lies in Special Flood Hazard Area Zone AH (EL 6), which requires that certain flood-mitigation features be incorporated into the design of the project in order to qualify for the *Special Flood Hazard Area Development Permit* needed to develop the site. Three principal flood-mitigation features will be incorporated into the Kihei Walgreens project.

⁸ Pre-development runoff calculations can be found in Appendix A-1.

- 1) The building floor will be constructed at elevation 7 feet, placing it 1 vertical foot above the mapped 100-year Base Flood Elevation of 6 feet.⁹
- 2) The parking lot will be constructed close to elevation of the existing ground, and approximately 20,000 cubic feet of earth will be excavated from the southwest corner of the site to create a large depression there. This excavation will offset the 100-year floodwater volume displaced by the building below the 6 ft. Base Flood Elevation and allow the development to comply with the "no rise" restriction currently enforced by the Maui County Planning Department for the AH (EL 6) Special Flood Hazard Area by achieving a condition in which there is no net floodwater volume displacement.¹⁰
- 3) The site will be graded so as to guide the 100-year floodwaters around the building and drain toward the ocean to enable the floodwaters to more quickly recede.¹¹ (See Figure 3-4)

⁹ Ref. Maui County Code, Section 19.62.060.A.3.a.

¹⁰ FEMA has not yet delineated the floodway for this particular Special Flood Hazard Area, so Planning Department is currently enforcing a general "no-rise" policy on the floodplain which prevents construction permits from being issued unless it can be proven that a proposed development will not increase the water surface elevation of the base flood at any point. [Ref. Maui County Code §19.62.050.B.3 and §19.62.060.A.6.]

¹¹ Ref. Maui County Code, Section 19.62.060.A.2.d.

3.2.2 Peak Runoff Mitigation

Walgreens' proposed development of the project site will generate approximately 6,500 cubic feet of runoff at a peak flow rate of approximately 6.6 cfs during a 50-year 1-hour storm event once the building and parking lot have been constructed.¹² This represents a 3.4 cfs increase in peak flow rate over what is now discharged by the existing gravel parking lot.

The developed site will be graded so that runoff from the building and parking lot will drain to the southwest corner of the project site into a stormwater retention basin to be constructed there. The 20,000 cubic foot capacity of this retention basin will be sufficiently large to capture and hold the entire 6,500 cubic feet of runoff generated by the developed site¹³, and will also exceed the minimum 3,900 cubic feet of storage capacity required by the Maui County Dept. of Public Works to keep the 50-year 1-hour post-development peak discharge rate at or below pre-development levels.¹⁴

3.2.3 Stormwater Quality

Maui County now requires new developments to implement permanent stormwater quality control measures to reduce water pollution from stormwater

¹² Post-development runoff calculations can be found in Appendix A-2.

¹³ See Appendix A-2 for post-development runoff volume calculation.

¹⁴ See Appendix A-3.1 for a runoff hydrograph of the developed site.

runoff.¹⁵ The 20,000 cu.ft. storage capacity of the onsite drainage retention basin will exceed the 5,300 cubic foot storage volume required by the Dept. of Public Works to meet the stormwater quality regulations associated with development of the project site.¹⁶

3.2.4 Runoff from Roadway Widening

The additional pavement which will be added to South Kihei Road and Nohokai Street to widen and improve them to the requirements of the Dept. of Public Works is expected to produce a 0.2 cfs increase in 50-year 1-hour peak stormflow and generate an additional 360 cubic feet of stormwater.¹⁷

There is no underground County storm drainage system present along South Kihei Road and Nohokai Street with sufficient available capacity to enable a conventional storm drain connection to be used to dispose of this additional pavement runoff. Therefore, a “Green Streets” approach¹⁸ will instead be employed to dispose of the added runoff at its source. Runoff from the widened pavement will directed through curb openings into stormwater planters constructed along the road shoulders where the stormwater will be held and allowed to

¹⁵ County of Maui, Department of Public Works, “Rules for the Design of Storm Water Treatment Best Management Practices,” Title MC-15, Chapter 111, November 15, 2012.

¹⁶ Water quality volume calculations may be found in Appendix A-3.2.

¹⁷ See Appendix A-4 for runoff volume calculations.

¹⁸ The City of Portland, Oregon, defines “Green Streets” as “a natural stormwater management approach that uses plants and soil to slow, filter, and cleanse stormwater from streets.” [Ref. *City of Portland, Oregon, "Green Streets: Frequently Asked Questions", November 2013.*]

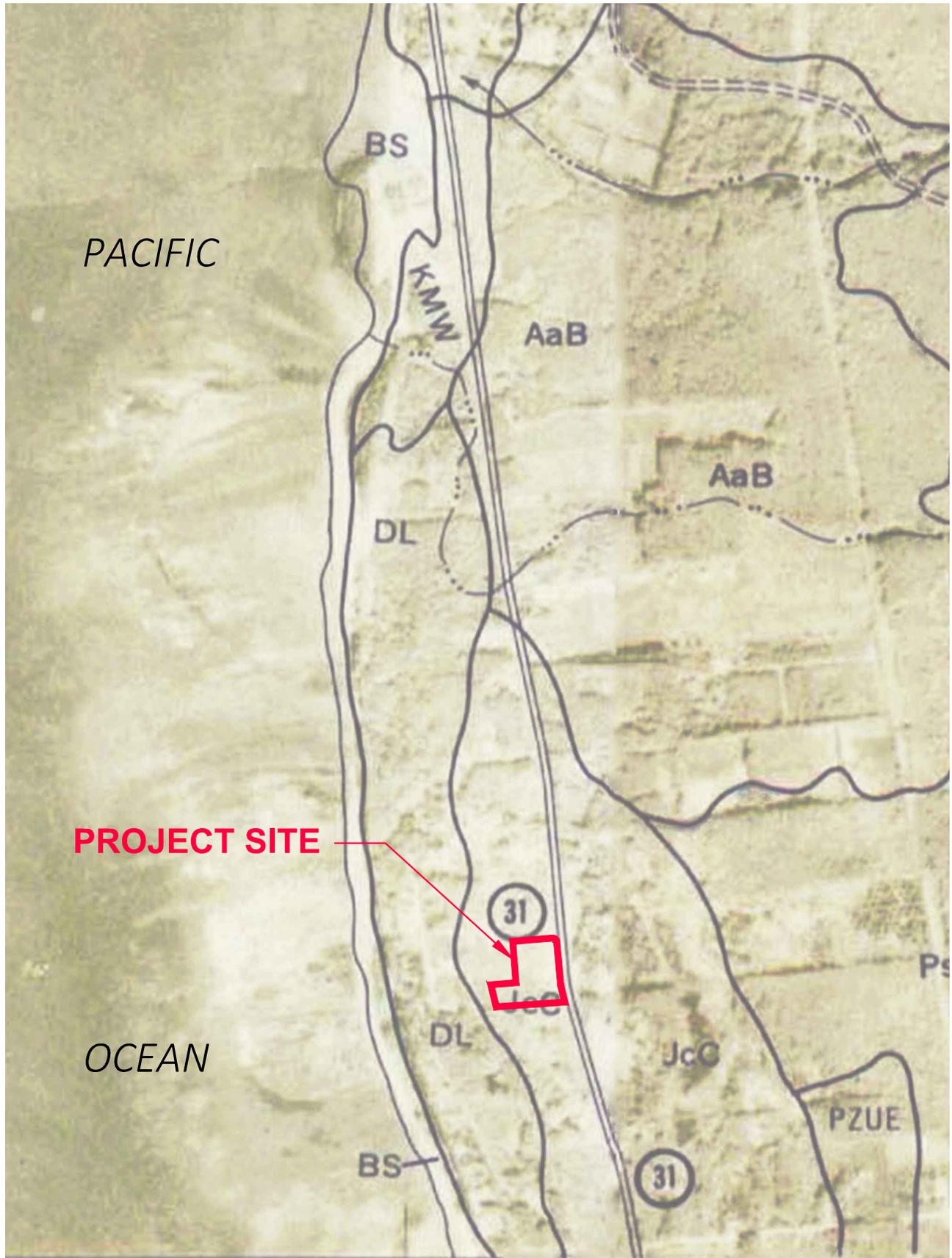
percolate into the ground. The stormwater planters will be constructed so as to provide a storage capacity no less than the 360 cubic feet of storage attributable to the added pavement.¹⁹

3.2.5 Offsite Runoff

The project site has no means of controlling the significant amount of offsite runoff it currently receives during large storm events from various properties which drain onto South Kihei Road. Therefore, the developed site will be configured to enable this pre-existing offsite runoff to continue to drain through the site on its way to the ocean as it now does. Walgreens' proposed development is much too small of a project to even begin solving the recurrent flooding problem which plagues the area; however, the mitigation measures it provides will ensure that development of the project will at least not make matters worse.

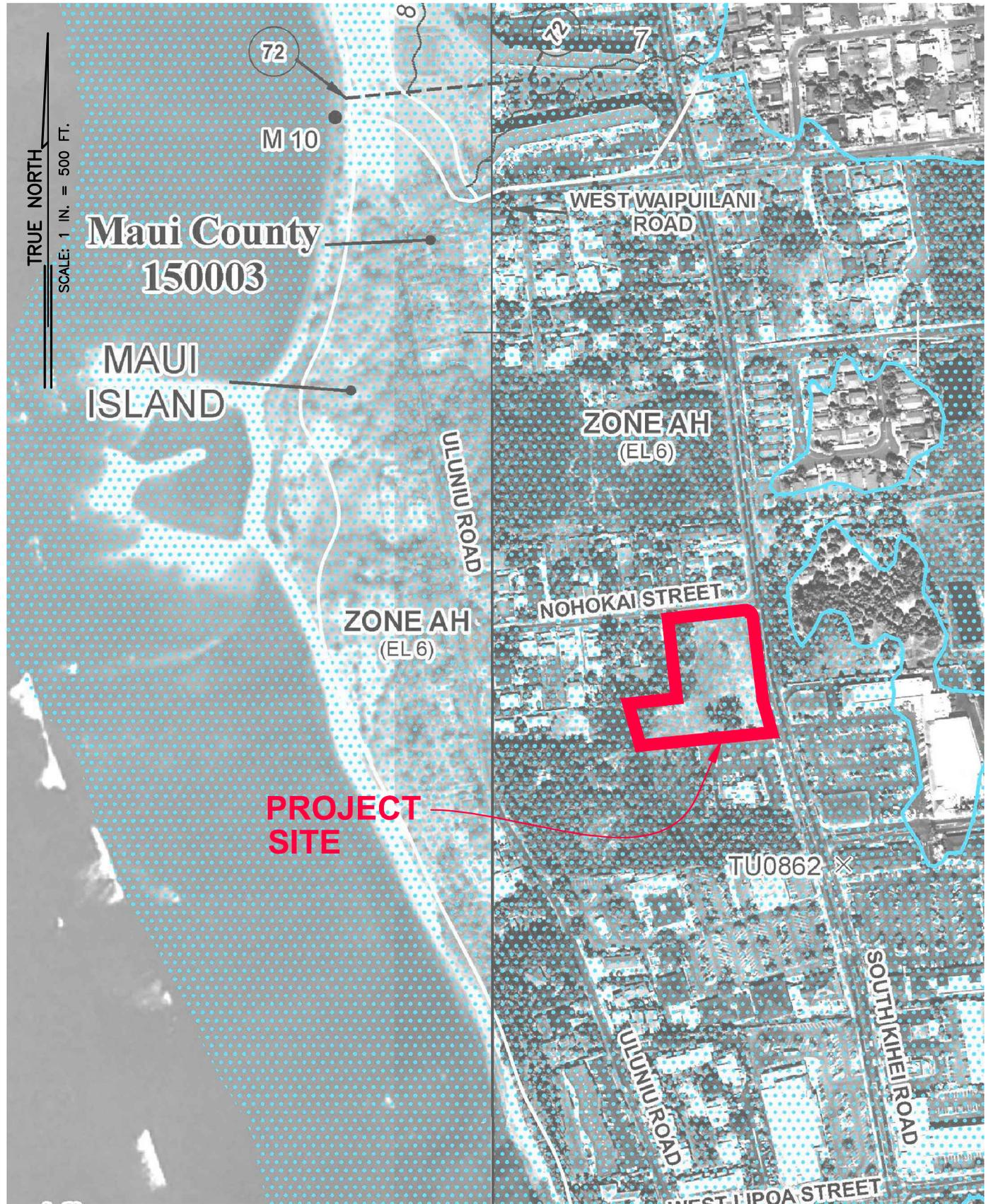
¹⁹ The location of the stormwater planters is shown in plan view on Figure 3-4 and depicted in cross-section on Figures 2-2a and 2-2b.

TRUE NORTH
SCALE: 1 IN. = 1000 FT.



Source:
United States Department of Agriculture, Soil Conservation Service,
"Soil Survey of Islands of Kauai, Oahu, Maui, Molokai , and Lanai,
State of Hawaii," August 1972, Maps 102 and 107.

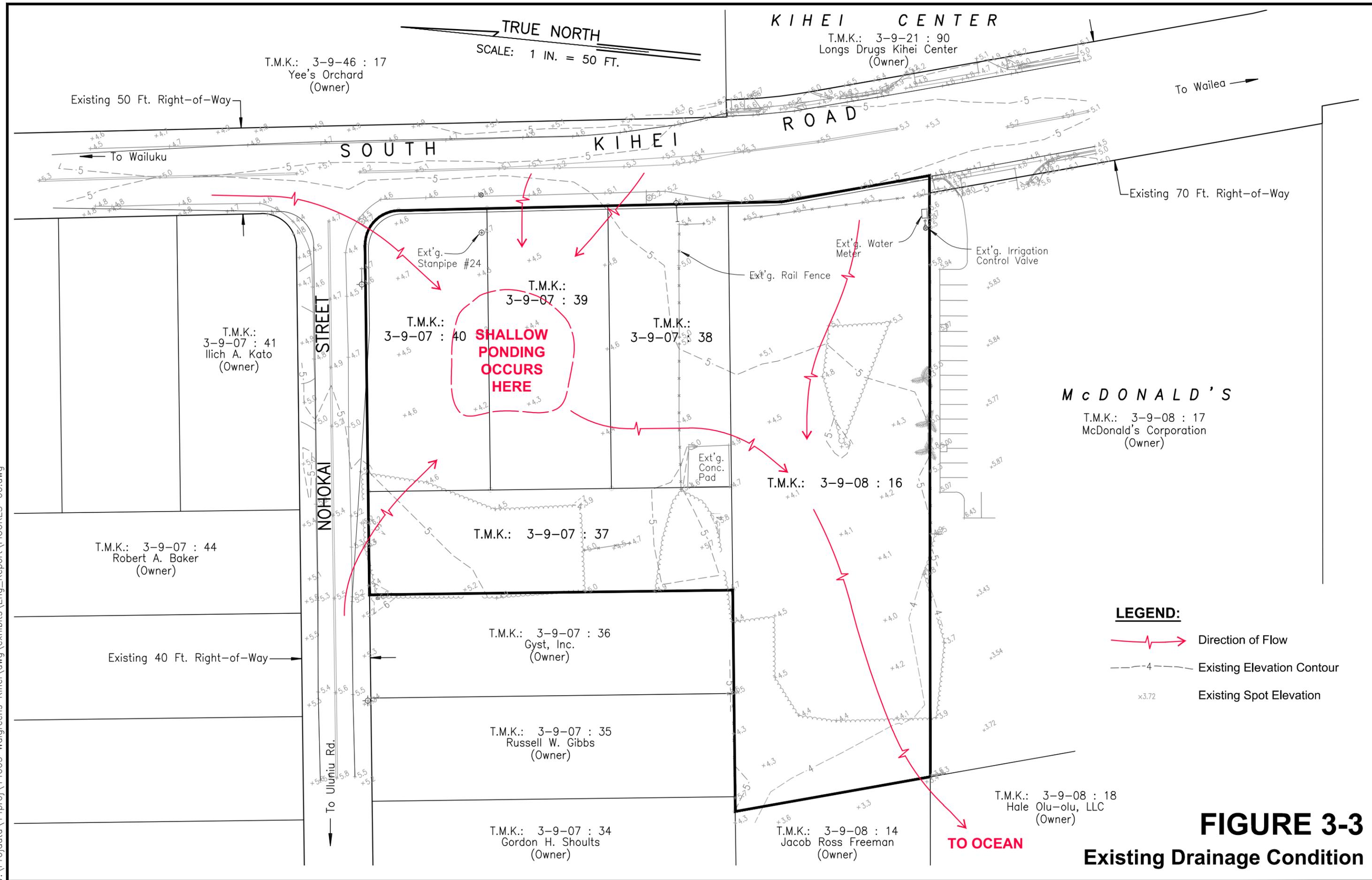
FIGURE 3-1
Soil Survey Map



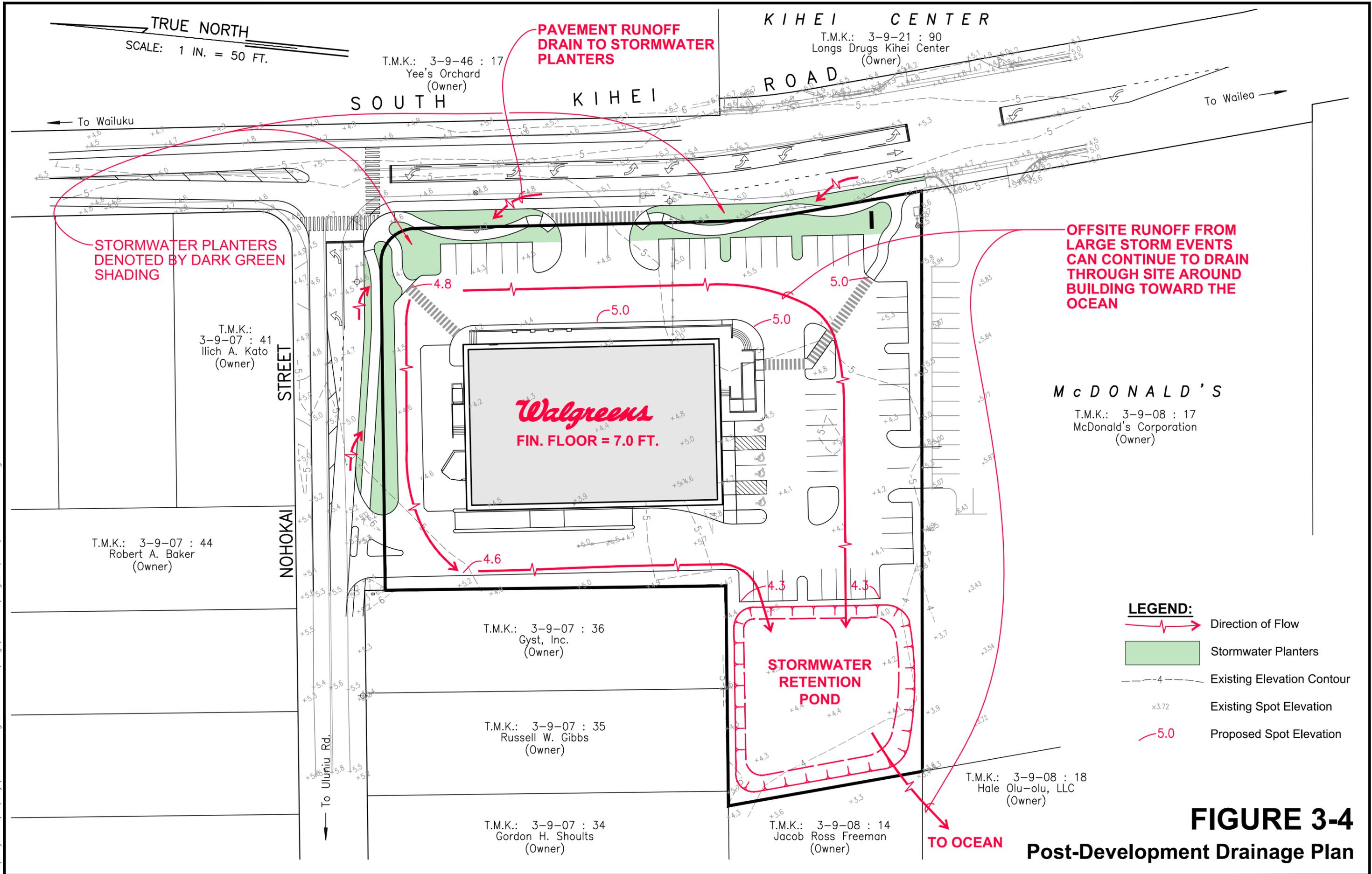
Source:
Federal Emergency Management Agency, National Flood Insurance Program, "Flood Insurance Rate Map, Maui County, Hawaii", Map Number 1500030567F and 1500030586F, September 19, 2012.

FIGURE 3-2
Flood Insurance Rate Map

V:\Projdata\14proj\14003 Walgreens Kihei\dwg\exhibits\Eng_Report\FIGURES-00.dwg



V:\Projdata\14proj\14003 Walgreens Kihei\dwg\exhibits\Eng_Report\FIGURES-00.dwg



TRUE NORTH
SCALE: 1 IN. = 50 FT.

T.M.K.: 3-9-46 : 17
Yee's Orchard
(Owner)

KIHEI CENTER
T.M.K.: 3-9-21 : 90
Longs Drugs Kihei Center
(Owner)

SOUTH KIHEI ROAD

STORMWATER PLANTERS DENOTED BY DARK GREEN SHADING

OFFSITE RUNOFF FROM LARGE STORM EVENTS CAN CONTINUE TO DRAIN THROUGH SITE AROUND BUILDING TOWARD THE OCEAN

T.M.K.: 3-9-07 : 41
Ilich A. Kato
(Owner)

McDONALD'S
T.M.K.: 3-9-08 : 17
McDonald's Corporation
(Owner)

T.M.K.: 3-9-07 : 44
Robert A. Baker
(Owner)

STREET
NOHOKAI

T.M.K.: 3-9-07 : 36
Gyst, Inc.
(Owner)

T.M.K.: 3-9-07 : 35
Russell W. Gibbs
(Owner)

T.M.K.: 3-9-07 : 34
Gordon H. Shoultz
(Owner)

T.M.K.: 3-9-08 : 14
Jacob Ross Freeman
(Owner)

T.M.K.: 3-9-08 : 18
Hale Olu-olu, LLC
(Owner)

LEGEND:
 -> Direction of Flow
 Stormwater Planters
 - - - Existing Elevation Contour
 x3.72 Existing Spot Elevation
 5.0 Proposed Spot Elevation

FIGURE 3-4
Post-Development Drainage Plan

4. WATER SYSTEM

4.1 Existing Infrastructure

The Kihei Walgreens site is located within the Maui County Department of Water Supply's Central Maui service area. The potable water supplied to this area comes from existing groundwater wells located in upper Waiehu and North Waihee which draw their water from the Iao and Waihee Aquifers. The water from these wells is conveyed across the island by the Central Maui Water Transmission System pipeline to the Department of Water Supply's 2.0 million gallon capacity storage tank above the Makai Heights Subdivision at elevation 220 feet. Water from this storage tank then reaches the project site through 16- and 18-inch transmission mains which feed the 12- and 6-inch distribution mains located under Nohokai Street and South Kihei Road.

One of the five parcels comprising the project site, TMK 3-9-08: 16, currently receives water through two County-issued water meters -- a 1½-inch and a 5/8-inch water meter²⁰ -- which are located on its South Kihei Road frontage and fed from the 6-inch County water main located under South Kihei Road. An existing 2½-inch standpipe at the northeast corner of the site now provides fire protection to the project site.

4.2 Projected Demand and Needed Improvements

The Kihei Walgreens store is expected to have an average daily potable water consumption of approximately 3,000 gallons per day, with about 2,000 gpd used for

²⁰ Water meter size and location confirmed by the Maui County Department of Water Supply Fiscal Division on October 13, 2014, and by letter from Director David Taylor of the Maui County Department of Water Supply with subject "Pre-Assessment Consultation for Walgreens Kihei," dated August 6, 2014.

domestic consumption and about 1,000 gpd used for landscape irrigation.²¹ The project's existing 1½-inch and 5/8-inch County-issued water meters on TMK 3-9-08: 16 possess sufficient capacity to supply this expected demand.²²

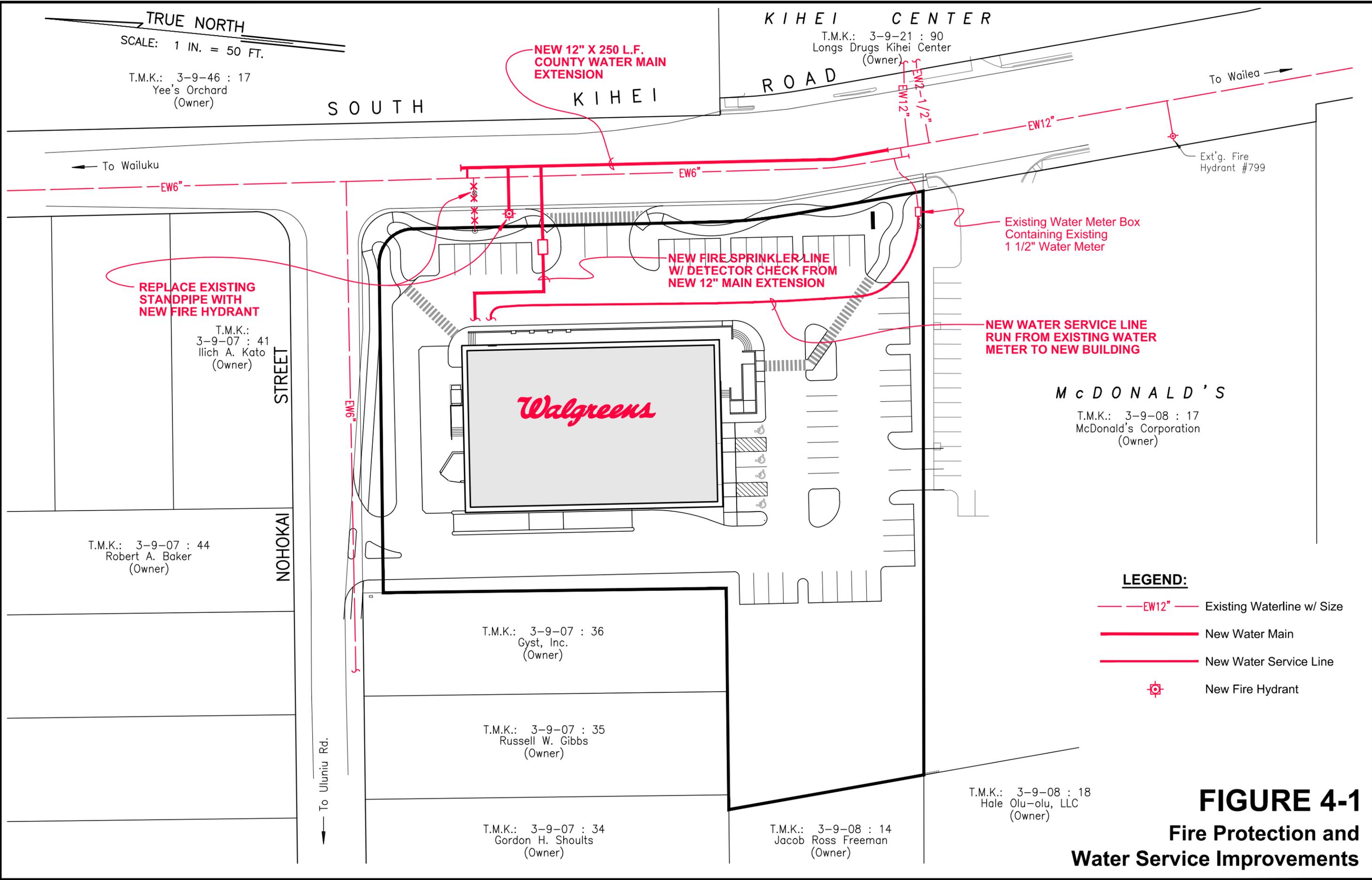
The new store building will need a fire protection system capable of delivering a fire flow of 2,250 gallons-per-minute from a storage reservoir with at least a 270,000 gallon storage capacity in order to meet Maui County Fire Department and Department of Water Supply standards for fire suppression.²³ The existing County 2.0 MG Makai Heights water tank will provide the needed storage volume for firefighting, and a 250 ft. long extension of the existing 12-inch water main under South Kihei Road (which currently ends near the southeast corner of the site) will provide the mainline capacity needed to deliver the required fire flow to the fire sprinkler system which will protect the new store. The existing 2½-inch standpipe now on the property will also be replaced with a new 6-inch fire hydrant that will be relocated onto the improved South Kihei Road shoulder. (See Figure 4-1)

²¹ Estimate based on demand projection method used by the Maui County Dept. of Water Supply. Potable water demand calculations may be found in Appendix B-1.

²² The existing County-issued 1½-inch and 5/8-inch water meters now installed on TMK 3-9-08: 16 have a combined flow capacity of 120 gallons per minute (gpm).

²³ Fire flow demand calculation may be found in Appendix B-2.

V:\Projdata\14proj\14003 Walgreens Kihei\dwg\exhibits\Eng_Report\FIGURES-00.dwg



5. WASTEWATER SYSTEM

5.1 Existing Infrastructure

Each of the five lots that make up the project site possesses an existing 6-inch County sewer service lateral.²⁴ The laterals are connected to existing gravity sewer mains under South Kihei Road and Nohokai Street which convey the collected wastewater to the nearby Kihei Pump Station No. 4 for transport to the County of Maui's Kihei Wastewater Reclamation Facility (KWWRF) for processing and disposal.

5.2 Projected Demand and Needed Improvements

The proposed Walgreens store is expected to discharge approximately 620 gallons of wastewater per day into the County sewerage system.²⁵ The sewerline from the new building will be connected to the one of the existing sewer service laterals on South Kihei Road through a new property line sewer service manhole in order to complete a service connection into the County gravity sewer collection system. (See Figure 5-1)

5.3 Treatment Capacity

The Maui County Dept. of Environmental Management Wastewater Reclamation Division reports that the County's Kihei Wastewater Reclamation Facility has

²⁴ Location of existing sewer service laterals documented in Maui County Department of Environmental Management Wastewater Reclamation Division record drawings for the North Kihei Sewerage System project.

²⁵ Estimate based on demand projection method used by the Maui County Dept. of Environmental Management's Wastewater Reclamation Division. Wastewater contribution calculation may be found in Appendix C.

approximately 4.6 million-gallons-per-day (mgd) of its 8.0 mgd treatment capacity still available based on measured average daily flows.²⁶ Consequently, there should be ample treatment capacity available to accommodate the 620 gallon daily wastewater flow that is expected to be generated by Walgreens' new store.²⁷

5.4 Impact Fees

Kihei Walgreens will be subject to two impact fees levied by the County of Maui to cover the cost of wastewater collection and treatment infrastructure serving the Kihei area, including:

- 1) A “Regional Wastewater Treatment System Facility Expansion Assessment Fee,” for treatment plant expansion, which is assessed at \$4.65 per gallon of project flow; and
- 2) A “Kihei Regional Wastewater Treatment System - Collection/Transmission System Project Assessment Fee,” for collection system upgrades, which is assessed at \$6.64 per gallon of project flow.

²⁶Actual average daily wastewater flows into the Kihei wastewater treatment plant measured 3.4 mgd as of December 31, 2012.

²⁷ Under the provisions of Hawaii Administrative Rules, Title 11, Chapter 62 - Wastewater Systems, Section 23.1, the County of Maui is required to initiate a treatment facility expansion plan once actual wastewater flows reach 75 percent of current plant capacity and implement that plan once actual wastewater flows reach 90 percent of plant capacity. Given this statutory mandate that treatment capacity be programmed to keep pace with demand, treatment capacity at the KWWRF can be relied upon to accommodate regional demand over time.

V:\Projdata\14proj\14003 Walgreens Kihei\dwg\exhibits\Eng_Report\FIGURES-00.dwg

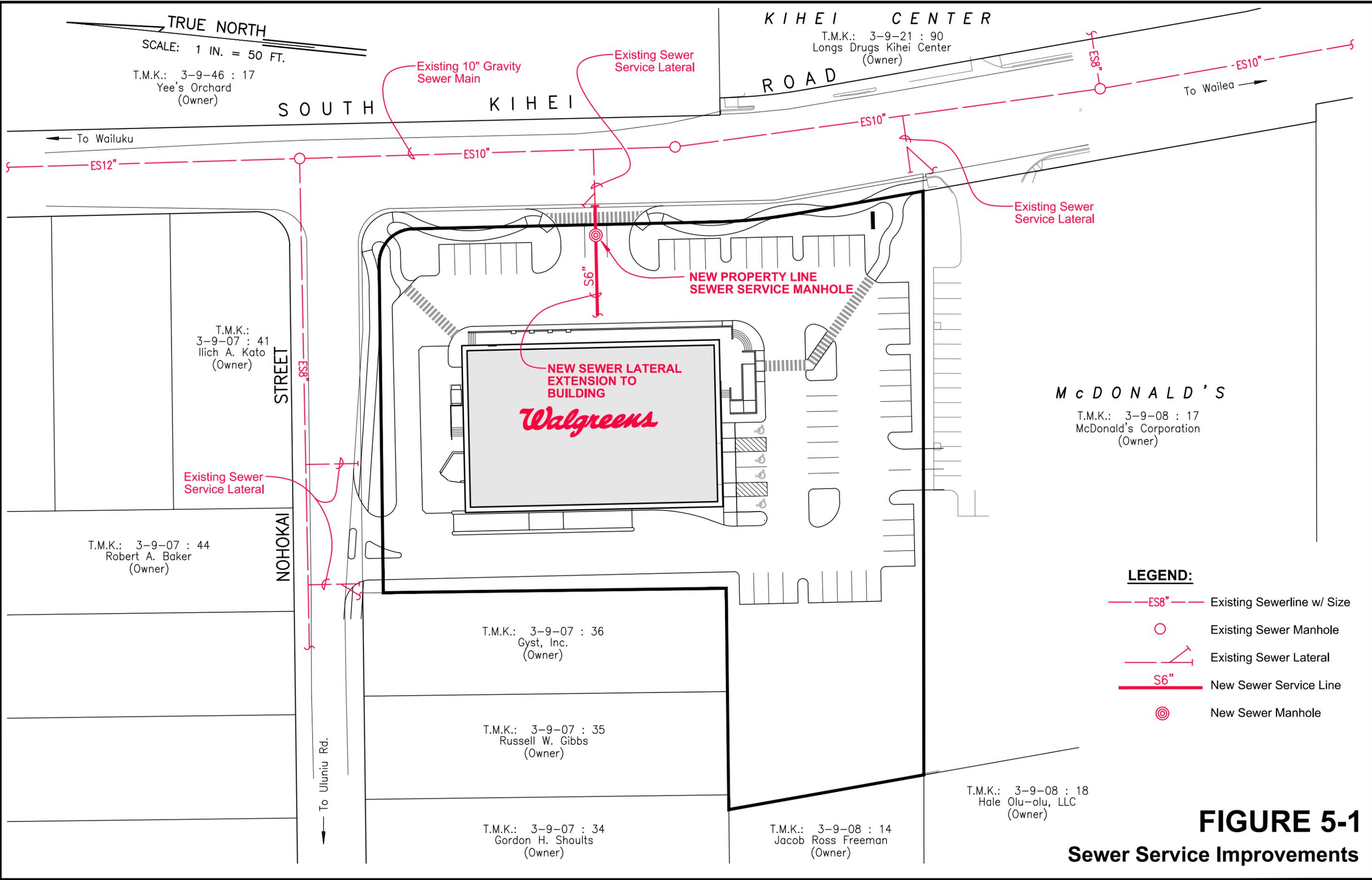


FIGURE 5-1
Sewer Service Improvements

6. POWER AND TELECOMMUNICATIONS

6.1 Maui Electric Company (MECO)

Maui Electric Company's Maalaea Power Plant serves the Kihei-Wailea region from the Kihei and Wailea Substations, which are connected by a 69kV (kilo-volt) overhead transmission line that runs along the western shoulder of Piilani Highway.

The existing MECO facilities at the Kihei Walgreens project site currently run overhead, with a 3-phase distribution line on the mauka side of South Kihei Road (across the street from the project site) and a single-phase overhead line run down Nohokai Street on Walgreens' side of the street. The Walgreens store will require 3-phase power, so service will need to be extended underground from the existing line across the street and a ground mounted transformer installed on the site. Walgreens will be required to construct the entry, street crossing, as well as underground ducts and structures.

Per Maui County requirements, existing overhead utilities along the property will need to be placed underground, unless a variance is obtained. The existing single-phase overhead line down Nohokai Street will need to be relocated underground across South Kihei Road and along the project's street frontage. MECO will require two riser poles at each end, so new poles may need to be installed to meet this requirement. Also of concern along Nohokai Street are a number of existing overhead service drops to the service pole across the street. These will also need to be relocated, possibly with a new pole. Along South Kihei Road there is an existing guy pole on the property side of the street, which will also need to be addressed. There is also the possibility the few of the existing MECO poles across South Kihei Road will need to be relocated to accommodate

the proposed road widening. This will be determined at the time detailed construction drawings are prepared. MECO is unable to estimate charges and cost to serve this project without detailed construction drawings. No alternate service routes were provided by Maui Electric Company.

6.2 Hawaiian Telcom

Hawaiian Telcom provides telephone and DSL services to the area in which the Kihei Walgreens project is located. Hawaiian Telcom's existing telephone plant serving the area should have sufficient capacity to service the Kihei Walgreens project. Existing telephone facilities in this area are overhead and follow the Maui Electric Company overhead lines. These overhead telephone facilities will need to be relocated underground in a manner similar to the MECO lines unless a variance is obtained. Telephone service to the site would come underground from across South Kihei Road and follow the MECO service entry.

Underground telephone support structures will be provided and installed at the developer's expense. Telephone cables will be installed at Hawaiian Telcom's expense, with customers responsible of service connections and monthly rental fees. No alternate service routes were provided by Hawaiian Telcom.

6.3 Oceanic Time Warner Cable

Oceanic Time Warner Cable is the cable television provider on Maui, but also provides telephone and internet connection services.

Existing Oceanic facilities are overhead and follow those of Maui Electric Company and Hawaiian Telcom. Existing overhead lines will need to be relocated underground, similarly to the other utilities. Service lines to the site will follow the other utilities underground across South Kihei Road. Cable television infrastructure must be installed at the developer's expense, while cables will be installed at Oceanic's cost. No alternate service routes were provided by Oceanic Time Warner Cable.

APPENDIX A
Drainage Calculations

APPENDIX A-1
Pre-Development Onsite Surface Runoff (50-yr./1-hr.)



Warren S. Unemori Engineering, Inc.
Civil & Structural Engineers · Land Surveyors
Wells Street Professional Center
2145 Wells Street, Suite 403
Wailuku, Maui, HI 96793

HYDROLOGIC CALCULATIONS - Surface Runoff

Project Name: Kihei Walgreens
Project No.: 14003
Engineer: Derek T. Ono
Date: 2/26/2015

Area

Description: Pre-development onsite surface runoff

Area (A): 1.87 acres
Impervious Area: 1.51 acres

Runoff Coefficient

Infiltration:	[High]	→	0
Relief:	[Flat]	→	0
Vegetal Cover:	[High]	→	0
Development:	[Agricultural]	→	0.15

Composite Runoff Coefficient: 0.15

Impervious Runoff Coefficient: 0.50

Weighted Runoff Coefficient (C): 0.43

Time of Concentration

Runoff Length: 180 ft.
Start Elevation: 5.5 ft. M.S.L.
End Elevation: 4.2 ft. M.S.L.
Average Slope: 0.7 %
Time of Concentration (T_c): 11.5 minutes

Intensity

Project Location: Kihei, Maui, Hawaii
Design Storm: 50-year recurrence interval, 1-hour duration
Rainfall Depth: 2.0 in.
Intensity (I): 3.98 in./hr.

Flow Rate

$$Q = C \cdot I \cdot A$$
$$= 3.2 \quad \text{ft.}^3/\text{sec.}$$

APPENDIX A-2
Post-Development Onsite Surface Runoff (50-yr./1-hr.)



Warren S. Unemori Engineering, Inc.
Civil & Structural Engineers · Land Surveyors
Wells Street Professional Center
2145 Wells Street, Suite 403
Wailuku, Maui, HI 96793

HYDROLOGIC CALCULATIONS - Surface Runoff

Project Name: Kihei Walgreens
Project No.: 14003
Engineer: Derek T. Ono
Date: 2/26/2015

Area

Description: Post-development onsite surface runoff

Area (A): 1.87 acres
Impervious Area: 1.35 acres

Runoff Coefficient

Landscape Runoff Coefficient: 0.15
Impervious Runoff Coefficient: 0.95
Weighted Runoff Coefficient (C): 0.73

Time of Concentration

Runoff Length: 500 ft.
Average Slope: 2.0 %
Time of Concentration (T_c): 5 minutes

Intensity

Project Location: Kihei, Maui, Hawaii
Design Storm: 50-year recurrence interval, 1-hour duration
Rainfall Depth: 2.0 in.
Intensity (I): 4.85 in./hr.

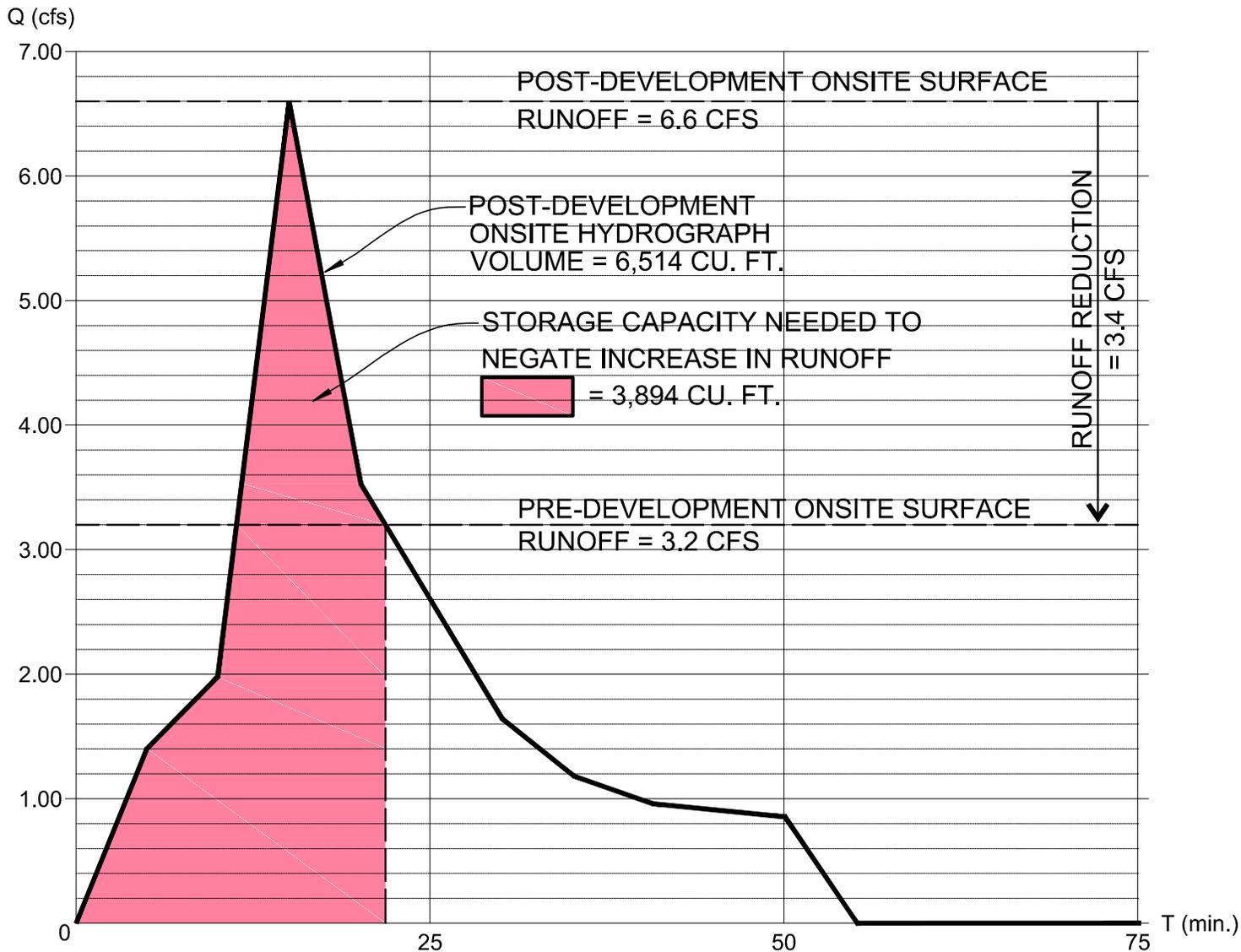
Flow Rate & Runoff Volume

$$Q = C \cdot I \cdot A$$
$$= 6.6 \text{ ft.}^3/\text{sec.}$$

$$V = 6514.2 \text{ ft.}^3$$

APPENDIX A-3
Retention Basin Sizing Calculations

APPENDIX A-3.1
Post-Development Onsite Runoff Hydrograph



NOTE:

1. TOTAL REQUIRED STORAGE CAPACITY =  = 3,894 CU. FT.
2. BASED ON 50-YR., 1-HR. STORM FOR KIHAI, HI (DEPTH=2.0 IN.)
3. RUNOFF REDUCTION = 6.6 CFS - 3.2 CFS = 3.4 CFS

FIGURE A-3.1

Post-Development Onsite Runoff Hydrograph

APPENDIX A-3.2
Storage Capacity Needed to Meet Water Quality Regulations



Warren S. Unemori Engineering, Inc.
Civil & Structural Engineers · Land Surveyors
Wells Street Professional Center
2145 Wells Street, Suite 403
Wailuku, Maui, HI 96793

HYDROLOGIC CALCULATIONS - Storm Water Treatment

Project Name: Kihei Walgreens
Project No.: 14003
Engineer: Derek T. Ono
Date: 2/26/2015

Purpose: To determine the required storage volume to meet the County of Maui, Department of Public Works' "Rules for the Design of Storm Water Treatment Best Management Practices"

Calculations: The required design volume for detention based control is computed by the MCC §15-111-5.a.1.C formula:

$$WQDV = C \cdot 1" \cdot A \cdot 3630$$

where, WQDV = water quality design volume in cubic feet
C = EPA volumetric runoff coefficient
A = gross area of the site in acres = 2.10 ac.
1" = design storm for detention based water quality system
3630 = conversion factor

The EPA volumetric runoff coefficient, C, calculated from the formula given in MCC §15-111-5.a.1.A is:

$$C = 0.05 + (0.009) \cdot (IMP)$$

where, IMP = percentage of impervious area
= (impervious area) / (gross area) · 100
= (1.52 ac.) / (2.10 ac.) · 100
= 72

Since IMP = 72, the value of C is:

$$C = 0.05 + (0.009) \cdot (72) \\ = 0.70$$

Compute the required design volume for a 1" storm with C = 0.70:

$$WQDV = C \cdot 1" \cdot A \cdot 3630 \\ = 0.70 \cdot 1" \cdot 2.10 \cdot 3630 \\ = 5,336 \text{ ft}^3$$

APPENDIX A-4
“Green Street” Storm water Planter Capacity Calculation

APPENDIX A-4.1
Pre-Development Shoulder Runoff (50-yr./1-hr.)



Warren S. Unemori Engineering, Inc.
Civil & Structural Engineers · Land Surveyors
Wells Street Professional Center
2145 Wells Street, Suite 403
Wailuku, Maui, HI 96793

HYDROLOGIC CALCULATIONS - Surface Runoff

Project Name: Kihei Walgreens
Project No.: 14003
Engineer: Derek T. Ono
Date: 2/26/2015

Area

Description: Pre-development shoulder runoff

Area (A): 0.23 acres
Impervious Area: 0.21 acres

Runoff Coefficient

Impervious Runoff Coefficient: 0.50
Weighted Runoff Coefficient (C): 0.50

Time of Concentration

Time of Concentration (T_c): 5 minutes

Intensity

Project Location: Kihei, Maui, Hawaii
Design Storm: 50-year recurrence interval, 1-hour duration
Rainfall Depth: 2.0 in.
Intensity (I): 4.85 in./hr.

Flow Rate

$$Q = C \cdot I \cdot A$$
$$= 0.6 \quad \text{ft.}^3/\text{sec.}$$

APPENDIX A-4.2
Post-Development Shoulder Runoff (50-yr./1-hr.)



Warren S. Unemori Engineering, Inc.
Civil & Structural Engineers · Land Surveyors
Wells Street Professional Center
2145 Wells Street, Suite 403
Wailuku, Maui, HI 96793

HYDROLOGIC CALCULATIONS - Surface Runoff

Project Name: Kihei Walgreens
Project No.: 14003
Engineer: Derek T. Ono
Date: 2/26/2015

Area

Description: Post-development shoulder runoff

Area (A): 0.23 acres
Impervious Area: 0.17 acres

Runoff Coefficient

Landscape Runoff Coefficient: 0.15
Impervious Runoff Coefficient: 0.95
Weighted Runoff Coefficient (C): 0.74

Time of Concentration

Time of Concentration (T_c): 5 minutes

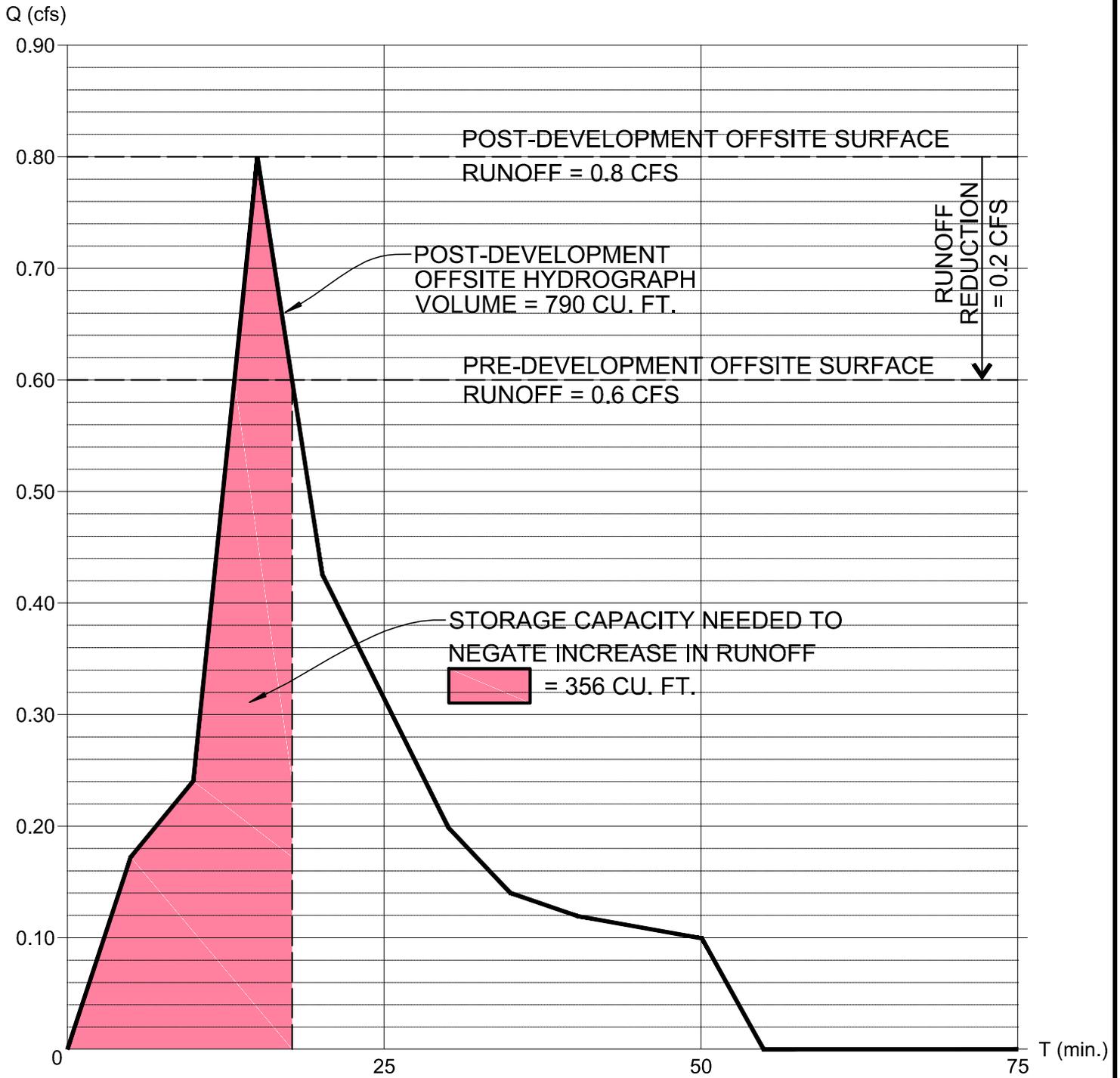
Intensity

Project Location: Kihei, Maui, Hawaii
Design Storm: 50-year recurrence interval, 1-hour duration
Rainfall Depth: 2.0 in.
Intensity (I): 4.85 in./hr.

Flow Rate & Runoff Volume

$$\begin{aligned} Q &= C \cdot I \cdot A \\ &= 0.8 \quad \text{ft.}^3/\text{sec.} \\ V &= 789.6 \quad \text{ft.}^3 \end{aligned}$$

APPENDIX A-4.3
Post-Development Shoulder Runoff Hydrograph



NOTE:

1. TOTAL REQUIRED STORAGE CAPACITY = = 356 CU. FT.
2. BASED ON 50-YR., 1-HR. STORM FOR KIHAI, HI (DEPTH=2.0 IN.)
3. RUNOFF REDUCTION = 0.8 CFS - 0.6 CFS = 0.2 CFS

FIGURE A-4.3

Post-Development Shoulder Runoff Hydrograph

APPENDIX B
Water Demand Calculations

APPENDIX B-1
Potable Water Demand Calculation

KIHEI WALGREENS
PROJECTED WATER DEMAND

<u>Use</u>	<u>Base Unit</u>	<u>Rate</u>	<u>Average Daily Demand (gpd)</u>
Drugstore Bldg.	14,550 sq.ft. x	140 gals/1000 sq.ft.* ==>	2,037
Landscape Irrigation	25,265 sq.ft. x	39 gals/1000 sq.ft.* ==>	985
TOTAL			3,022

Note:

** Consumption rates based on County of Maui, Department of Water Supply, Water System Standards, 2002, Table 100-18: "Domestic Consumption Guidelines," p. 111-3.*

Commercial: 140 gpd / 1,000 s.f.

Irrigation: 1,700 gpd/acre ÷ 43,560 s.f. = 39 gpd / 1,000 s.f.

APPENDIX B-2
Fire Flow Demand Calculation

ISO FIRE FLOW DEMAND¹ CALCULATION FOR
KIHEI WALGREENS

Required Fire Flow, $F = 18 C A^{0.5}$

Where: C = Construction Type Coefficient
A = Total Floor Area

C = 1.0 (Ordinary construction)
A = 14,550 sq.ft.
F = $18(1.0)(14,550)^{0.5}$
= 2,171 gpm ==> 2,250 gpm (Rounded to nearest 250 gpm)

CLOSEST BUILDINGS (CURRENT CONDITION):

120 ft. to North
150+ ft. to South
150+ ft. to East
60 ft. to West

ADJUSTMENTS FOR HAZARD AND EXPOSURE:

2,250 gpm
- 0 gpm (No Adjustment for Occupancy)
+ 113 gpm (+ 5% Building Separation to North)
+ 0 gpm (+ 0% Building Separation to South)
+ 0 gpm (+ 0% Building Separation to East)
+ 338 gpm (+15% Building Separation to West)

2,701 gpm ==> 2,750 gpm (Rounded to nearest 250 gpm)

¹Based on Insurance Services Office, "Guide for the Determination of Required Fire Flow", Second Edition, December 1974.

ADJUSTMENT FOR AUTOMATIC SPRINKLER PROTECTION:

	2,750 gpm	
-	1,375 gpm	(-50% Reduction for Automatic Fire Sprinklers)
+	500 gpm	(Estimated flow demand from fire sprinklers)
+	250 gpm	(Additional hose streams)
	<hr/>	
	2,125 gpm	==> <u>2,250 gpm</u> (Rounded to nearest 250 gpm)

February 23, 2015

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APPENDIX C
Wastewater Demand Calculation

KIHEI WALGREENS
PROJECTED SEWER DEMAND

<u>Planned Use</u>	<u>Basis</u>	<u>Contribution Rate</u>	<u>Sewer Demand</u>
Retail Area	14,550 s.f.	x 15 gals/350 s.f./day*	==> 624 gpd
<hr/>			
Total			624 gpd

Source:

* Contribution rates based on County of Maui, Wastewater Reclamation Division, "Wastewater Flow Standards," February 2, 2000.