



APPENDIX L
Preliminary Engineering Report
dated December, 2013 revised February 2, 2017.

Preliminary Engineering Report

PIILANI PROMENADE

Kihei, Maui, Hawaii

TMK: (2) 2-2-02: por. 16 and por. 82

TMK: (2) 3-9-01: 16, por. 148, por. 169, 170 - 174

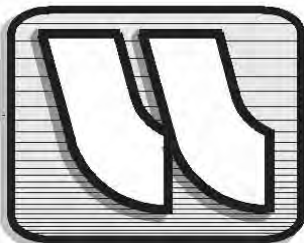
TMK: (2) 3-9-48: por. 122

Prepared For:

Sarofim Realty Advisors

8115 Preston Road, Suite 400

Dallas, TX 75225



WARREN S. UNEMORI ENGINEERING, INC.

Civil and Structural Engineers – Land Surveyors

Wells Street Professional Center – Suite 403

2145 Wells Street

Wailuku, Maui, Hawaii 96793

December 17, 2013

Revised: February 2, 2017

TABLE OF CONTENTS

	<u>Page</u>
1. INTRODUCTION	
1.1 Purpose	1-1
1.2 Project Description	1-1
1.3 Project Location	1-1
1.4 Existing Obligation to Construct Infrastructure	1-2
2. DRAINAGE	
2.1 Existing Conditions	2-1
2.1.1 Topography and Soils	2-1
2.1.2 Flood and Tsunami Zone	2-2
2.1.3 Existing Drainage Pattern	2-2
2.2 Drainage Plan for Offsite Runoff	2-4
2.3 Drainage Plan for Onsite Runoff	2-4
2.3.1 Projected Increase in Runoff	2-4
2.3.2 Proposed Improvements	2-5
2.3.3 Post-Development Runoff after Application of Mitigation Measures	2-6
<i>Figure 2-1 Soil Survey Map</i>	
<i>Figure 2-2 Flood Insurance Rate Map</i>	
<i>Figure 2-3 Existing Drainage Pattern</i>	
<i>Figure 2-4 Post-Development Drainage Pattern</i>	
3. WATER SYSTEM	
3.1 Existing Infrastructure	3-1
3.1.1 Potable Water System	3-1
3.1.2 Non-Potable Water System	3-1

3.2	Proposed Improvements	3-2
3.2.1	Potable Water System	3-2
3.2.2	Non-Potable Water System	3-3
3.3	Water Requirements	3-4
3.3.1	Water Sources	3-4
3.3.2	Fire Protection	3-5

Figure 3-1 Potable Water System Improvements

Figure 3-2 Non-Potable Water System Improvements

4.	WASTEWATER SYSTEM	
4.1	Existing Infrastructure	4-1
4.2	Sewer Improvements	4-1
4.3	Treatment Capacity	4-2
4.4	Impact Fees	4-2

Figure 4-1 Sewer System Improvements

5.	ROADWAY IMPROVEMENTS	
5.1	Existing Roadways	5-1
5.2	Proposed Improvements	5-1
5.2.1	Vehicular Access	5-1
5.2.2	Proposed Improvements	5-2

Figure 5-1 Vehicular Access Plan

Figure 5-2 Bike and Pedestrian Improvements

Figure 5-3 Typical Section Along East Kaonoulou Street

Figure 5-4 Bike & Pedestrian Way from Ohukai Road to East Kaonoulou Street

6.	POWER AND TELECOMMUNICATIONS	
6.1	Maui Electric Company Power System	6-1
6.2	Telephone and CATV System	6-2

Figure 6-1 Electrical Power Improvements

APPENDIX A - Drainage Calculations

A-1	Pre-Development Onsite Surface Runoff (50-yr./1-hr.)
A-2	Post-Development Onsite Surface Runoff (50-yr./1-hr.) Total
A-3	North Detention Basin Sizing Calculations
A-3.1	Post-Development Onsite Surface Runoff (50-yr./1-hr.) North
A-3.2	Post-Development Onsite Surface Runoff (50-yr./1-hr.) Roads, Water Tank and Diversion Ditch
A-3.3	North Detention Basin Sizing for Water Quality Protection
A-4	South Detention Basin Sizing Calculations
A-4.1	Post-Development Onsite Surface Runoff (50-yr./1-hr.) South
A-4.2	South Detention Basin Sizing for Water Quality Protection
A-5	Drain Inlet Pollution Filter Details

APPENDIX B - Drainage Report for Kaonoulu Market Place

(Approved by State of Hawaii Dept. of Transportation and Maui
County Dept. of Public Works in 2009)

APPENDIX C - Water Demand Calculations

C-1	Potable and Non-Potable Water Demand Calculation
C-2	Available Meter Capacity vs. Projected Demand
C-3	Fire Flow Demand Calculation

APPENDIX D - Wastewater Calculations

Preliminary Engineering Report for Piilani Promenade

1. INTRODUCTION

1.1 Purpose

This report describes the existing infrastructure in the vicinity of the Piilani Promenade project and identifies the key infrastructure improvements that will be needed to implement the proposed development plan.

1.2 Project Description

The project is located in Kihei, Maui on the easterly side of Piilani Highway. It lies south of Kihei Commercial Center and north of Kulanihakoi Gulch.

1.3 Project Location

Piilani Promenade will be a mixed-use development project combining light industrial, commercial, public/quasi-public and residential components on approximately 68 acres of M-1 (light-industrial) zoned land. The current development plan proposes approximately 530,000 square feet of commercial building space, 57,000 square feet of light industrial building space, a 2.3 acre recreational park and 226 residential units within a low-rise multi-family apartment complex.

The mixed use development will be part of a larger 76 acre project area consisting of: three developable lots (TMK 3-9-01: 16, 170 and 171) with a combined area of approximately 68 acres; three roadway lots (TMK 3-9-01: 172, 173 and 174) totaling approximately 7 acres; a 1 acre water tank lot (TMK 2-2-07: 77); and portions of adjacent land parcels on which various improvements will be constructed (TMK 3-9-01: 148 and 169; TMK 2-2-02: 16 and 82; and TMK 3-9-048: 122.)

1.4 Existing Obligation to Construct Infrastructure

Piilani Promenade will be constructed on Lots 2A, 2C and 2D of the Kaonoulu Ranch Large-Lot Subdivision No. 2, which received final subdivision approval from the County of Maui in 2009 with all required subdivision improvements secured by an obligation agreement and \$22 million performance bond.¹ These bonded subdivision improvements, which include extensive roadway and utility infrastructure², also represent most of the major infrastructure components needed to develop Piilani Promenade.

¹Ref. letters dated:

- August 14, 2009 from Maui County Department of Public Works granting final subdivision approval under bond to *Kaonoulu Ranch (Large-Lot) Subdivision No. 2* (Subdivision File No. 2.2795) and *Kaonoulu Ranch Water Tank Subdivision* (Subdivision File No. 2.2995); and
- September 17, 2010 from Maui County Department of Public Works acknowledging assumption of subdivision bond obligation by Piilani Promenade LLC.

²The bonded improvements are described by the *Construction Plans for Kaonoulu Marketplace*, approved in 2008 by the State of Hawaii Dept. of Transportation, various County of Maui Departments and the local Public Utilities. Construction of these improvements has been authorized by permits issued between 2010 and 2012 by the approving State and County Departments.

2. DRAINAGE

2.1 Existing Conditions

2.1.1 Topography and Soils

The project area is currently undeveloped pasture land covered by brush and scattered trees. The existing terrain generally slopes steadily downward from east to west at an average slope of roughly 4%. Elevation across the project area ranges from approximately 234 feet above Mean Sea Level (MSL) at the 1.0 MG Water Tank site to approximately 30 feet MSL at Piilani Highway. An existing minor natural drainageway (Drainageway “A”) runs northeast-to-southwest across the project area before converging with the main stem of Kulanihakoi Gulch below Piilani Highway.

According to the USDA’s *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*,³ the predominant soil classification found on the project area is Waiakoa extremely stony silty clay loam (WID2) (see Figure 2-1). This soil is characterized as having medium runoff and posing a potentially severe erosion hazard if left exposed.

³ United States Department of Agriculture, Soil Conservation Service, *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*, August 1972, p. 127, Map 107.

2.1.2 Flood and Tsunami Zone

The Federal Emergency Management Agency's Flood Insurance Rate Maps⁴ for the Kihei area place Piilani Promenade within Zone X, indicating that it lies outside of the 500-year floodplain (see Figure 2-2).

2.1.3 Existing Drainage Pattern

Offsite Storm Flows

Storm runoff from approximately 471 acres of undeveloped land east (mauka) of Piilani Promenade is conveyed by Drainageway "A" to the eastern boundary of the project area (see Figure 2-3). The 100-year, 24-hour peak runoff conveyed in Drainageway "A" is 498 cfs⁵ at this point. Once across the eastern boundary, Drainageway "A" continues across the project area in an east-west direction to an existing 102-inch twin barrel culvert crossing at Piilani Highway. Once across Piilani Highway, Drainageway "A" converges with the main stem of Kulanihakoi Gulch before reaching the Pacific Ocean.

⁴ U.S. Department of Homeland Security, Federal Emergency Management Agency, *Flood Insurance Rate Map, Maui County, Hawaii*, Community-Panel Number 150003 0580E and 0586E, September 25, 2009.

⁵ Offsite flow rate is documented in Appendix B, "Drainage Report for Kaonoulu Market Place," page 4.

Ohukai Subdivision, an existing residential development located to the northeast of Piilani Promenade, discharges approximately 25 cfs⁶ of stormwater runoff toward the project area from a drainage outlet located on the south side of Ohukai Road. Runoff discharged from Ohukai Subdivision's drainage culvert is conveyed by Drainageway "B" southward, until it converges with Drainageway "A", described earlier.

Onsite Storm Flows

The existing, undeveloped project area generates approximately 85 cfs of surface runoff during a 50-year 1-hour storm.⁷ This runoff sheet flows in a westerly direction until it is intercepted by either Kulanihakoi Gulch, Drainageway "A", existing concrete drainage ditches along Piilani Highway, or an existing 54-inch culvert⁸ at Piilani Highway located near the northwest corner of the project area (see Figure 2-3) – all of which eventually drain to the main stem of Kulanihakoi Gulch before reaching the ocean.

⁶ Offsite discharge rate from Ohukai Subdivision can be found in Appendix B, "Drainage Report for Kaonoulu Market Place," page 4.

⁷See Appendix A-1 for supporting calculations.

⁸ Runoff entering the 54-inch culvert at Piilani Highway enters the Kaonoulu Estates subdivision's drainage system, which eventually discharges into Kulanihakoi Gulch.

2.2 Drainage Plan for Offsite Runoff

Offsite runoff will be allowed to pass through the project area and will not be affected by the development of Piilani Promenade. Offsite surface runoff conveyed in Drainageways “A” and “B” will be routed to a new diversion ditch constructed along the project’s eastern boundary, then down along East Kaonoulou Street in a large underground drainline which will convey the runoff to the existing 102-inch culvert crossing at Piilani Highway (see Figure 2-4).

2.3 Drainage Plan for Onsite Runoff

2.3.1 Projected Increase in Runoff

Once developed, the Piilani Promenade project area is expected to produce a peak runoff volume of 292 cfs from a 50-year 1-hour storm.⁹ This represents a net increase of approximately 207 cfs attributable to development of the project area. A comparative summary of pre-development and post-development surface runoff is presented in Table 2-1 below:

Table 2-1 - Increase in Runoff Attributable to Development of Piilani Promenade

Drainage Area	Pre-Development Flow	Post-Development Flow Before Mitigation	Net Change
Onsite	85 cfs	292 cfs	+207 cfs

⁹ See Appendix A-2 for supporting calculations.

2.3.2 Proposed Improvements

Collection, Disposal, and Mitigation of Peak Flow

Surface runoff generated by Piilani Promenade’s buildings and pavement will be directed to drain inlets located throughout the development, then conveyed by underground drainlines to stormwater detention facilities for peak flow mitigation (see Figure 2-4). Underground detention chambers within Promenade South and an open detention pond within Promenade North with a combined storage capacity of 7.6 acre-feet will limit downstream stormwater discharges to a peak flow rates that do not exceed pre-development levels, in compliance with Maui County’s Drainage Rules.¹⁰

Water Quality Measures

Maui County now requires the implementation of water quality control measures to reduce water pollution from stormwater runoff.¹¹ Both “flow through” and “detention based” treatments will be employed by Piilani Promenade to mitigate stormwater-related water pollution

¹⁰ County of Maui, Department of Public Works and Waste Management, “Rules for the Design of Storm Drainage Facilities in the County of Maui,” Title MC-15, Chapter 4, November 2, 1995.

¹¹ 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.

associated with the Promenade North and South development sites.¹²

“Flow through” treatment will be achieved by outfitting parking lot drain inlets with filters capable removing up to 80 percent of Total Suspended Solids.¹³ “Detention based” treatment will be provided by providing additional storage volume in the subsurface detention chambers and surface detention pond to facilitate sediment removal in addition to peak flow mitigation.

2.3.3 Post-Development Runoff After Application of Mitigation Measures

The proposed stormwater detention improvements must fully mitigate the increase in peak flow attributable to development while simultaneously providing water pollution control. Table 2-2 summarizes the storage capacity within the stormwater detention system needed to achieve both these objectives.

¹² The East Kaonoulu Street roadway improvements, Piilani Highway roadway improvements, 1.0 MG water storage tank and other improvements associated with the Kaonoulu Ranch Large-Lot Subdivision No. 2 were approved prior to the effective date of County Ordinance 3902 which established the storm water quality requirements and so are exempt from these requirements. *Ref. Maui County Ordinance 3902:*

“SECTION 2. The requirements of this ordinance shall not apply to any subdivision that receives preliminary subdivision approval prior to the effective date [July 7, 2012] of this ordinance.”

¹³ See Appendix A-5 for a representative example of the type of drain inlet pollution filter system which will be employed.

Table 2-2 - Drainage Detention System Capacity for Piilani Promenade

Storage Capacity Required to Meet Water Quality Criteria	Additional Storage Capacity Required to Mitigate Peak Flow	Total Storage Capacity to be Provided
2.5 ac.-ft.	5.1 ac.-ft. ¹⁴	7.6 ac.-ft.

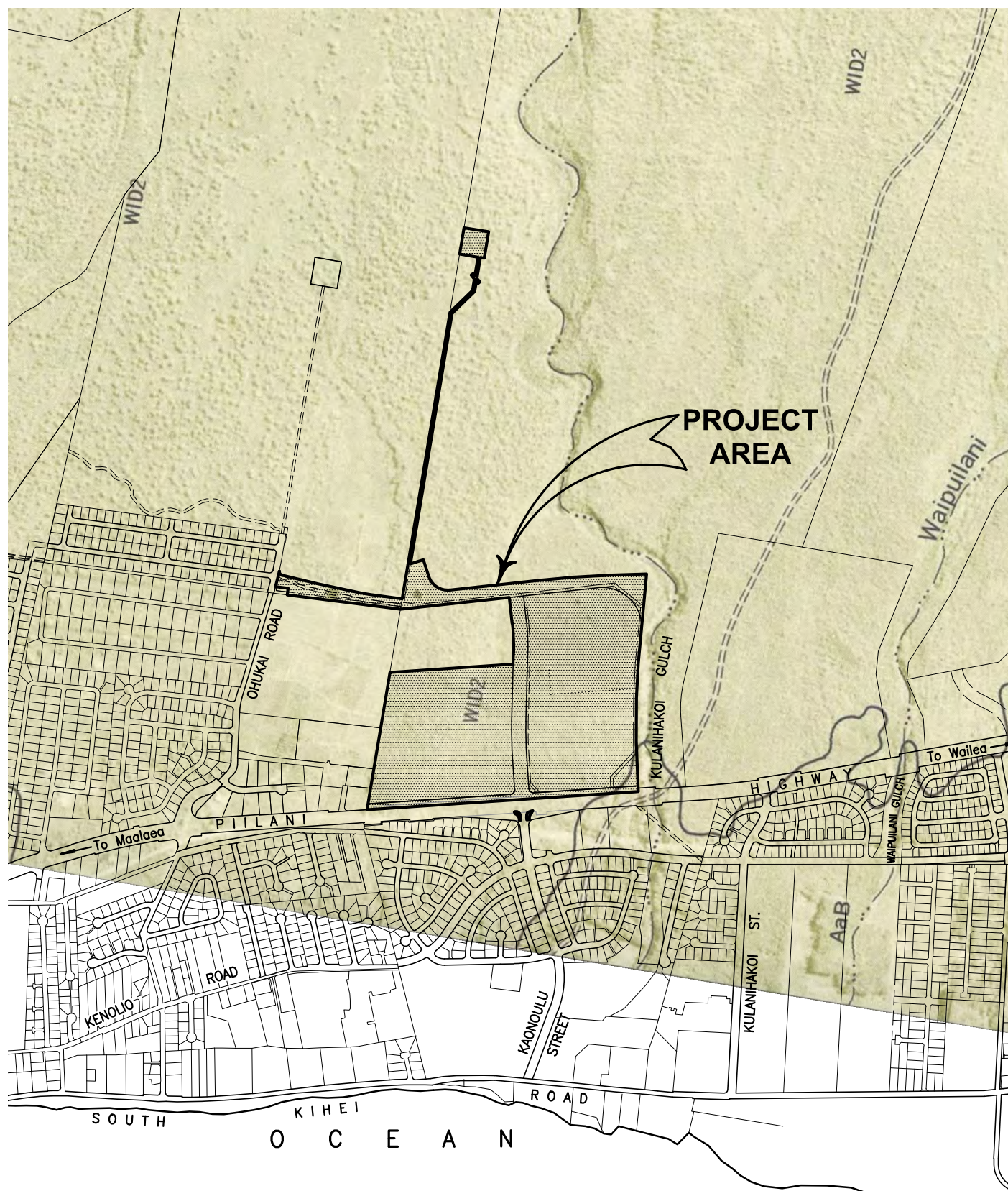
Once the stormwater detention facilities are in place, the hydrologic impact on downstream properties resulting from the proposed development of Piilani Promenade will be negligible, as summarized in Table 2-3.

Table 2-3 - Result of Peak Runoff Mitigation by Piilani Promenade

Drainage Area	Acreage	Pre-Development Peak Flow	Post-Development Peak Flow <i>Before</i> Mitigation	Post-Development Peak Flow <i>After</i> Mitigation	Net Change in Peak Runoff
North	30.1	31.2 cfs	107.7 cfs	9.6 cfs	-21.6 cfs
South	38.1	41.0 cfs	148.2 cfs	39.2 cfs	-1.8 cfs
Roads, Water Tank, Diversion Ditch	9.4	12.5 cfs	35.9 cfs	35.9 cfs	+23.4 cfs
Total	77.6	84.7 cfs	291.8 cfs	84.7 cfs	0.0 cfs

¹⁴ See Appendices A-3 and A-4 for supporting calculations.

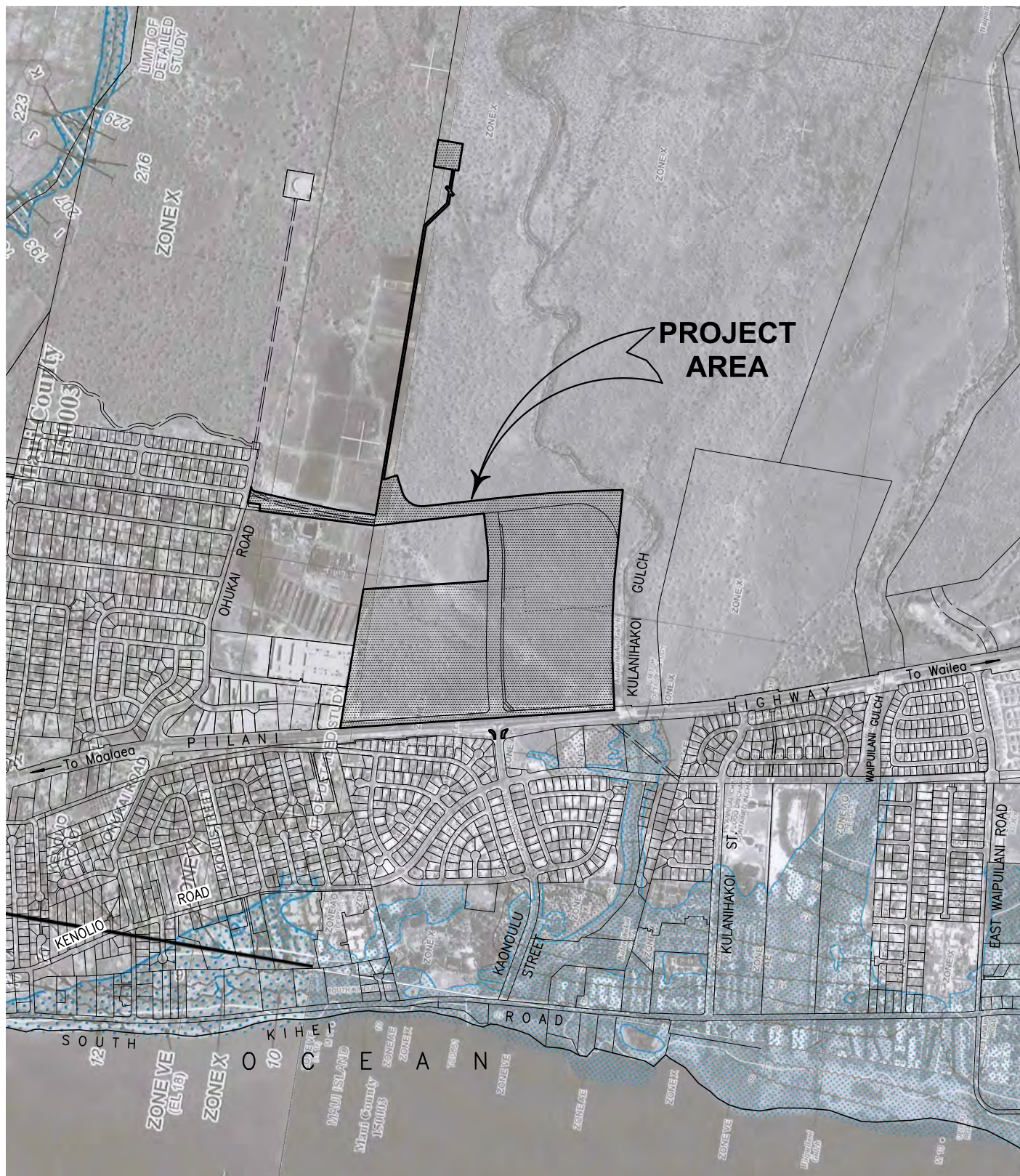
TRUE NORTH
SCALE: 1 IN. = 1200 FT.



Source:
U.S. Department of Agriculture, Soil Conservation Service, "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii", 1972, Map Sheet 107.

FIGURE 2-1
Soil Survey Map

TRUE NORTH
SCALE: 1 IN. = 1200 FT.

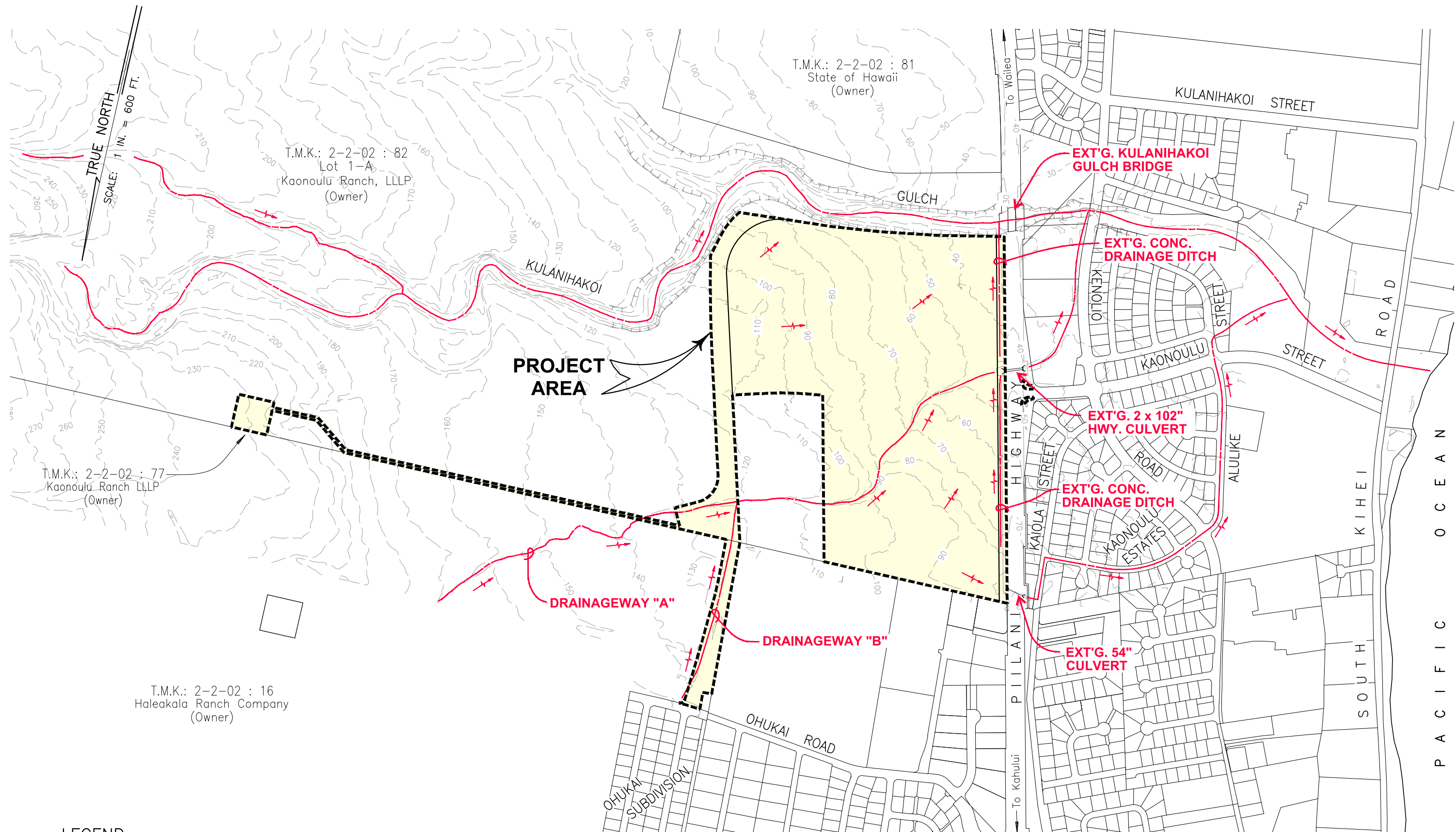


Source:

U.S. Department of Homeland Security, Federal Emergency Management Agency, "Flood Insurance Rate Map, Maui County, Hawaii", Map Numbers 1500030580E and 1500030586E September 25, 2009.

FIGURE 2-2
Flood Insurance Rate Map

V:\Projdata\13proj\13037\dwg\exhibits\PER\Extg-Drainage Pattern-00.dwg



LEGEND:

-  DIRECTION OF FLOW
-  PROJECT AREA LIMITS
-  FLOW LINE
-  EXISTING ELEVATION CONTOUR

FIGURE 2-3
Existing Drainage Pattern

V:\Projdata\13proj\13037\dwg\exhibits\PER\Proposed-Drainage Pattern-00.dwg

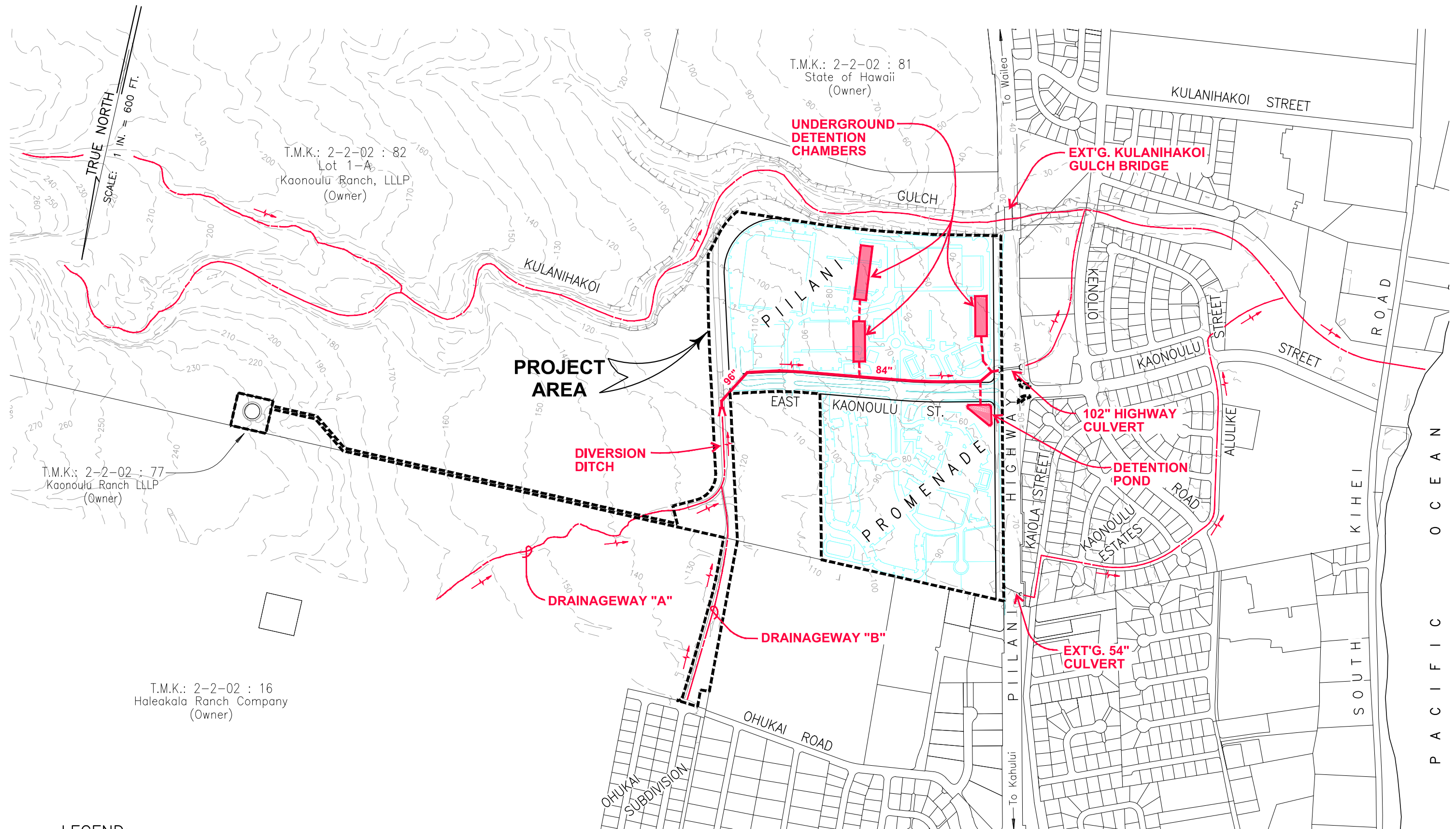


FIGURE 2-4
Post-Development Drainage Pattern

3. WATER SYSTEM

3.1 Existing Infrastructure

3.1.1 Potable Water System

The Piilani Promenade development is located within the Maui County Department of Water Supply's Central Maui service area. Potable water for the proposed development will come from existing groundwater wells located in upper Waiehu and North Waihee which draw groundwater from the Iao and Waihee Aquifers. Potable water from these wells is pumped into an existing 1.0 million gallon (MG) capacity concrete water storage tank located in upper Waiehu¹⁵, then conveyed across the isthmus by the Central Maui Water Transmission System's 36-inch diameter transmission main to consumers in South Maui. The existing Department of Water Supply water distribution system does not currently extend into the project area.

3.1.2 Non-Potable Water System

An irrigation well permit was obtained from the State Water Resource Commission for a well which was constructed in 2011 on Lot 2B¹⁶ of the Kaonoulou Ranch Large-Lot Subdivision No. 2 at a wellhead elevation of 118 feet. The well has been proven capable of producing 216,000 gallons of non-potable

¹⁵The floor elevation of the 1.0 MG Waiehu Storage Tank is approximately 490 feet MSL.

¹⁶Lot 2B of the Kaonoulou Ranch Large-Lot Subdivision No. 2 is TMK (2) 3-9-001: 169.

water per day and a permanent 150 gpm pump has since been installed. No distribution infrastructure has yet been constructed to utilize the water, however.

3.2 Proposed Improvements

3.2.1 Potable Water System

Piilani Promenade will be served by the water system improvements that it will construct to complete the subdivision improvement requirements for Kaonoulu Ranch Large-Lot Subdivision No. 2.¹⁷ (See Figure 3-1) These improvements will consist of:

- 1) relocating a 2,500 ft. long segment of DWS' existing 36-inch diameter Central Maui Water Transmission System waterline from its present alignment, which now crosses the project area, onto a new alignment along East Kaonoulu Street;
- 2) constructing a new 1.0 million gallon (MG) capacity concrete water storage reservoir located at elevation 220 feet that will be dedicated to the Dept. of Water Supply upon completion;
- 3) installing a 3200 ft. long, 12-inch diameter transmission waterline extending from the DWS' existing 36-inch Central Maui Water

¹⁷ Ref. Letter dated August 14, 2009 from County of Maui Department of Public Works granting final subdivision approval under bond to *Kaonoulu Ranch (Large-Lot) Subdivision No. 2* (Subdivision File No. 2.2795) and *Kaonoulu Ranch Water Tank Subdivision* (Subdivision File No. 2.2995).

Transmission line to the 1.0 MG storage reservoir that will be used to fill the new storage tank;

- 4) installing a 5,500 ft. long, 16-inch diameter distribution main extending from the new 1.0 MG storage reservoir to East Kaonoulu Street which will deliver potable water for domestic use and fire protection to the Piilani Promenade project site; and
- 5) installing a further 1,100 ft. long extension of a 12-inch diameter distribution main across Piilani Highway to a connection point at the 18-inch diameter waterline on Kenolio Road to provide water circulation and link the new water system improvements to the County water distribution system serving the Kihei area.

3.2.2 Non-Potable Water System

Permanent electrical power, a permanent pump control system and a small control tank will be installed at the existing irrigation well site on Lot 2B to complete the outfitting of this well and enable it to be used as a permanent source of irrigation water for Piilani Promenade. A 6-inch diameter water main will be installed along one shoulder of East Kaonoulu Street to deliver non-potable well water to the various irrigation systems that will be used to irrigate landscaping on East Kaonoulu Street and throughout the Piilani Promenade development. (See Figure 3-2)

A future connection point at the eastern end of the irrigation main will be provided to enable the irrigation system to utilize reclaimed water from the County's R-1 system in the future, once that system has expanded northward and reaches the Piilani Promenade development.¹⁸

3.3 Water Requirements

3.3.1 Water Sources

Piilani Promenade will consume an average of 252,000 gallons of water per day (gpd) at build-out, including 171,000 gpd of potable water for domestic uses and 81,000 gpd of non-potable water for irrigation.¹⁹

The development currently has three 3-inch Dept. of Water Supply-issued domestic water meters available, whose combined 1050 gpm flow capacity exceeds the roughly 600 gpm of flow capacity expected to be needed by Piilani Promenade to complete the build out of its proposed development plan.²⁰ Consequently, no additional potable water sources beyond the issued County water meters should be needed to implement the Piilani Promenade development plan.

The existing 216,000 gpd capacity irrigation well is capable of supplying both the expected 81,000 average and 121,000 maximum daily demand of non-

¹⁸ Providing for a future connection to the County reclaimed water system is a condition of County zoning for this project. (Ref. Maui County Ordinance 2772, effective May 25, 1999.)

¹⁹Water demand calculations may be found in Appendix C-1.

²⁰Water meter capacity calculations may be found in Appendix C-2.

potable irrigation water needed to complete the build out of the proposed development plan. Consequently, no additional non-potable water sources beyond the existing well are needed.

3.3.2 Fire Protection

Piilani Promenade will require a fire protection system capable of delivering a fire flow of 3,000 gallons-per-minute (gpm)²¹ from a storage reservoir with at least a 360,000 gallon storage capacity²² to meet Maui County Fire Department and Department of Water Supply requirements for fire suppression. These requirements will be met or exceeded by the construction of the 1.0 MG capacity water storage tank and 16-inch distribution main, which together will be capable of delivering the required volume of water.

²¹See Appendix B-4 for fire flow demand calculation.

²²Reservoir storage capacity required to support needed fire flow for two hours:
 $3000 \text{ gpm} \times 120 \text{ minutes} = 360,000 \text{ gallons}$

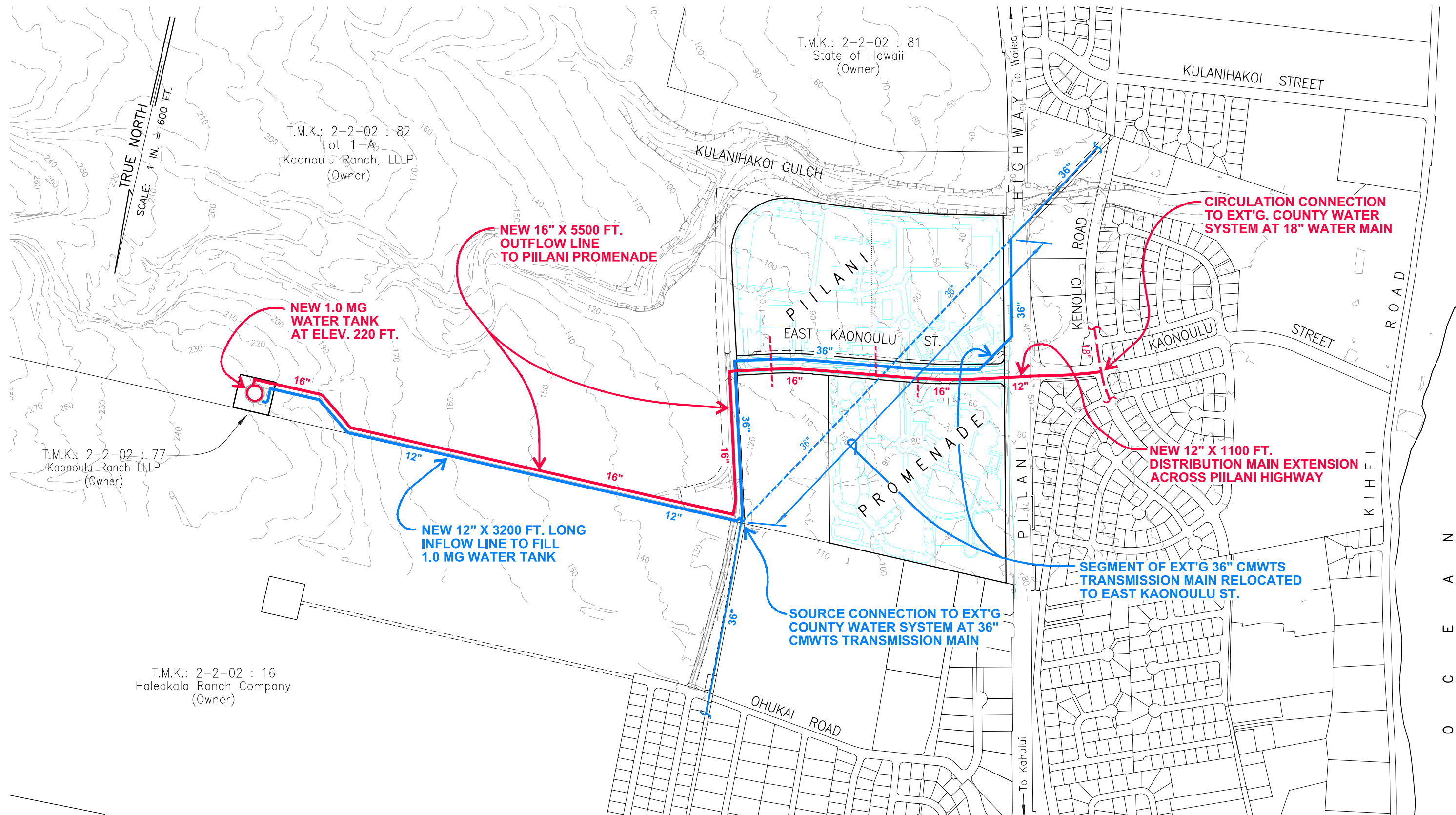


FIGURE 3-1
Potable Water System Improvements

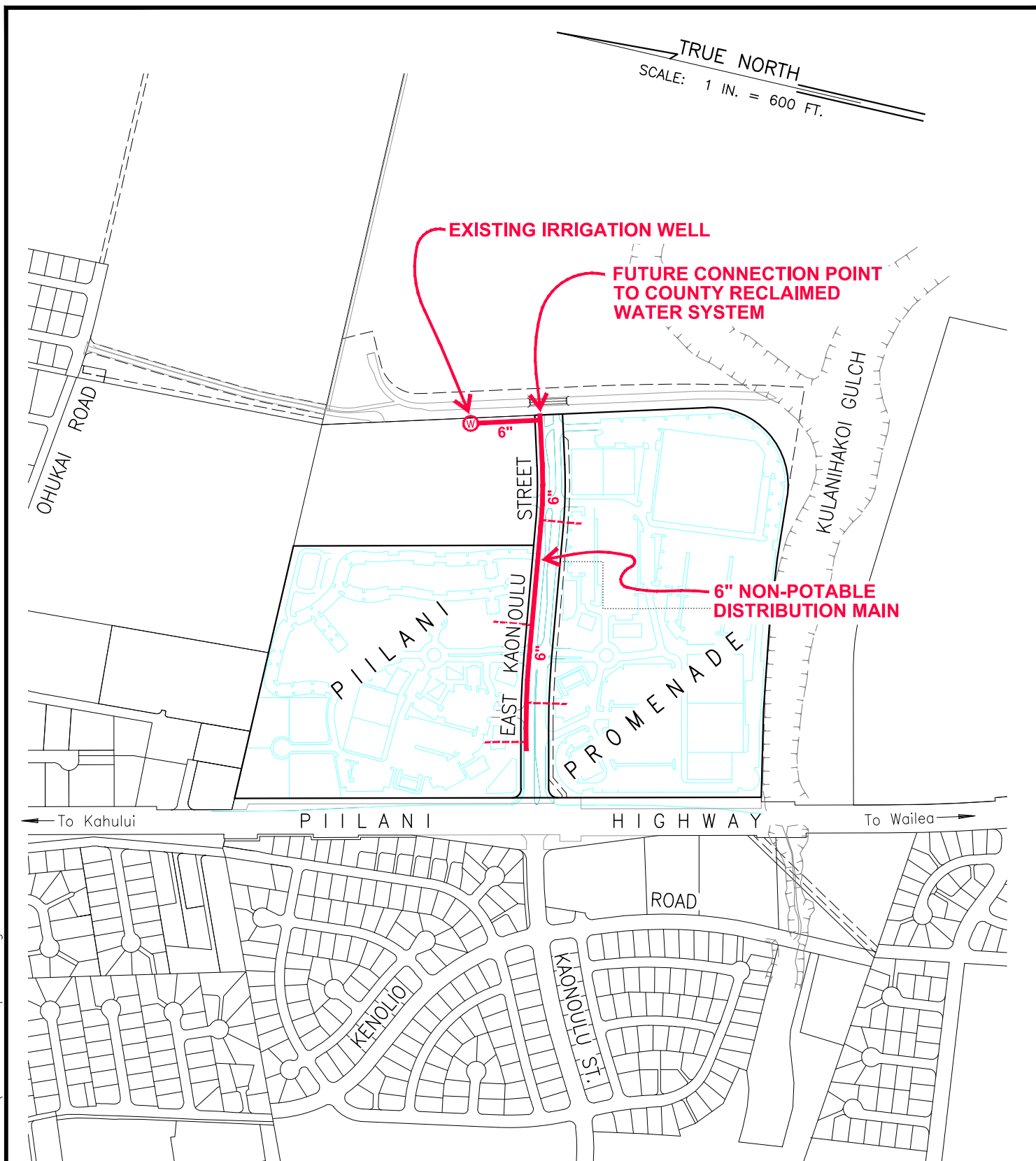


FIGURE 3-2
Non-Potable Water System Improvements

4. WASTEWATER SYSTEM

4.1 Existing Infrastructure

The project site is currently not sewerred; however, the sewerage system operated by the County of Maui is located nearby, to the west of project site across Piilani Highway. Wastewater collected by the County's Kihei sewerage sewer system is conveyed by a series of existing gravity lines, pump stations and force mains along Kihei Road which transports the collected wastewater to the County of Maui's Kihei Wastewater Reclamation Facility (KWWRF) for processing and disposal.

4.2 Sewer Improvements

Piilani Promenade is expected to generate 114,000 gallons of wastewater per day.²³ The development will connect to the existing County sewerage system at a point approximately 1,400 feet west of project site at the intersection of Kaonoulu and Alulike Streets, makai of Piilani Highway, where the County's sewer system has sufficient capacity to accept the wastewater generated by the project. A 2,600 ft. long gravity sewer mainline consisting of 8- and 10-inch diameter pipe will extend eastward along Kaonoulu Street and across Piilani Highway from this connection point to the Piilani Promenade project site. (See Figure 4-1)

²³Sewer demand calculations may be found in Appendix D.

4.3 Treatment Capacity

The Maui County Dept. of Environmental Management, Wastewater Reclamation Division reports that the County's Kihei Wastewater Reclamation Facility has approximately 4.6 million-gallons-per-day (mgd) of its 8.0 mgd treatment capacity still available based on measured average daily flows.²⁴ Consequently, there should be ample treatment capacity available to accommodate the 114,000 gallon (0.1 mgd) daily wastewater flow expected to be generated by the Piilani Promenade project.²⁵

4.4 Impact Fees

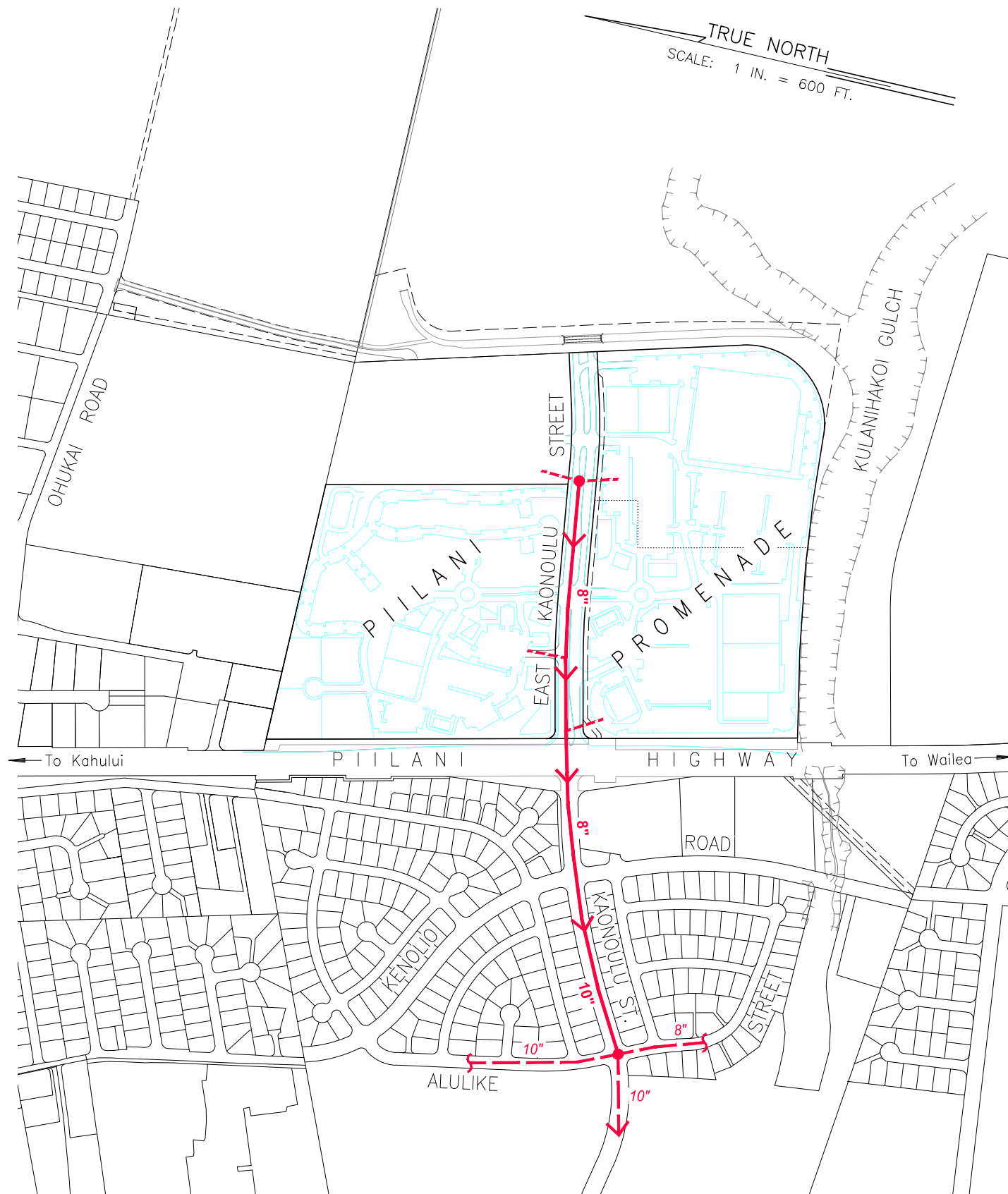
Piilani Promenade will be subject to two impact fees levied by the County of Maui to cover the cost of wastewater collection and treatment infrastructure serving the Kihei area, including:

- A "Regional Wastewater Treatment System Facility Expansion Assessment Fee," for treatment plant expansion, which is assessed at \$4.65 per gallon of project flow. Piilani Promenade will be assessed approximately \$530,100 for the 114,000 gpd of wastewater flow which the project is expected to generate.

²⁴ Actual average daily wastewater flows into the Kihei wastewater treatment plant measured 3.4 mgd as of December 31, 2012.

²⁵ 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.

- 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. Piilani Promenade will be assessed approximately \$756,960 for the 114,000 gpd of wastewater flow which the project is expected to generate.



LEGEND:

- 8" NEW GRAVITY SEWERLINE
- SEWER LATERAL
- > DIRECTION OF FLOW
- EXISTING GRAVITY SEWERLINE

FIGURE 4-1
Sewer System Improvements

5. ROADWAY IMPROVEMENTS

5.1 Existing Roadways

Piilani Highway – a four-lane highway which is owned and maintained by the Hawaii State Department of Transportation and serves as the primary north-south arterial highway linking Kihei and the other cities on the island of Maui – currently provides the only improved access to the project site. Its intersection with Kaonoulou Street planned western terminus of the Kihei-Upcountry Maui Highway, whose alignment was approved in 2002.²⁶

A secondary access route to the project site in the form of a 44-foot wide access easement extending from the Ohukai Road / Hale Kai Street intersection across Haleakala Ranch lands was obtained in 2001; however, this access easement has remained unimproved to date.

5.2 Proposed Improvements

5.2.1 Vehicular Access

Piilani Promenade will signalize and substantially widen the existing intersection at Piilani Highway and Kaonoulou Street and construct a four-lane, 1,800 ft. long extension of Kaonoulou Street east of Piilani Highway. Once completed, East Kaonoulou Street will provide the primary vehicular access to and

²⁶The Record of Decision for the Kihei-Upcountry Maui Highway Final Environmental Impact Statement was approved on May 21, 2002.

from the Piilani Promenade development onto Piilani Highway. Access to and from the Northern and Southern portions of Piilani Promenade development will be provided by a combination of driveways along East Kaonoulu Street that will include: (See Figure 5-1)

- one full-movement signalized driveway;
- one full-movement stop-controlled driveway;
- two right-turn-only stop-controlled driveways; and
- one stop-controlled service-vehicle driveway with a restricted left-turn - movement.

A Traffic Impact Analysis Report Update has been prepared which discusses the needed geometric improvements at the Piilani Highway/Kaonoulu Street intersection in greater depth.²⁷

5.2.2 Bicycle and Pedestrian Access

Bicycle and pedestrian access to Piilani Promenade will be facilitated by a number of improvements constructed with the development.

- East Kaonoulu Street will be constructed with walking and cycling paths on both shoulders to allow convenient bike and pedestrian access to Piilani Promenade. (See Figures 5-2 and 5-3) The bike paths will tie into the

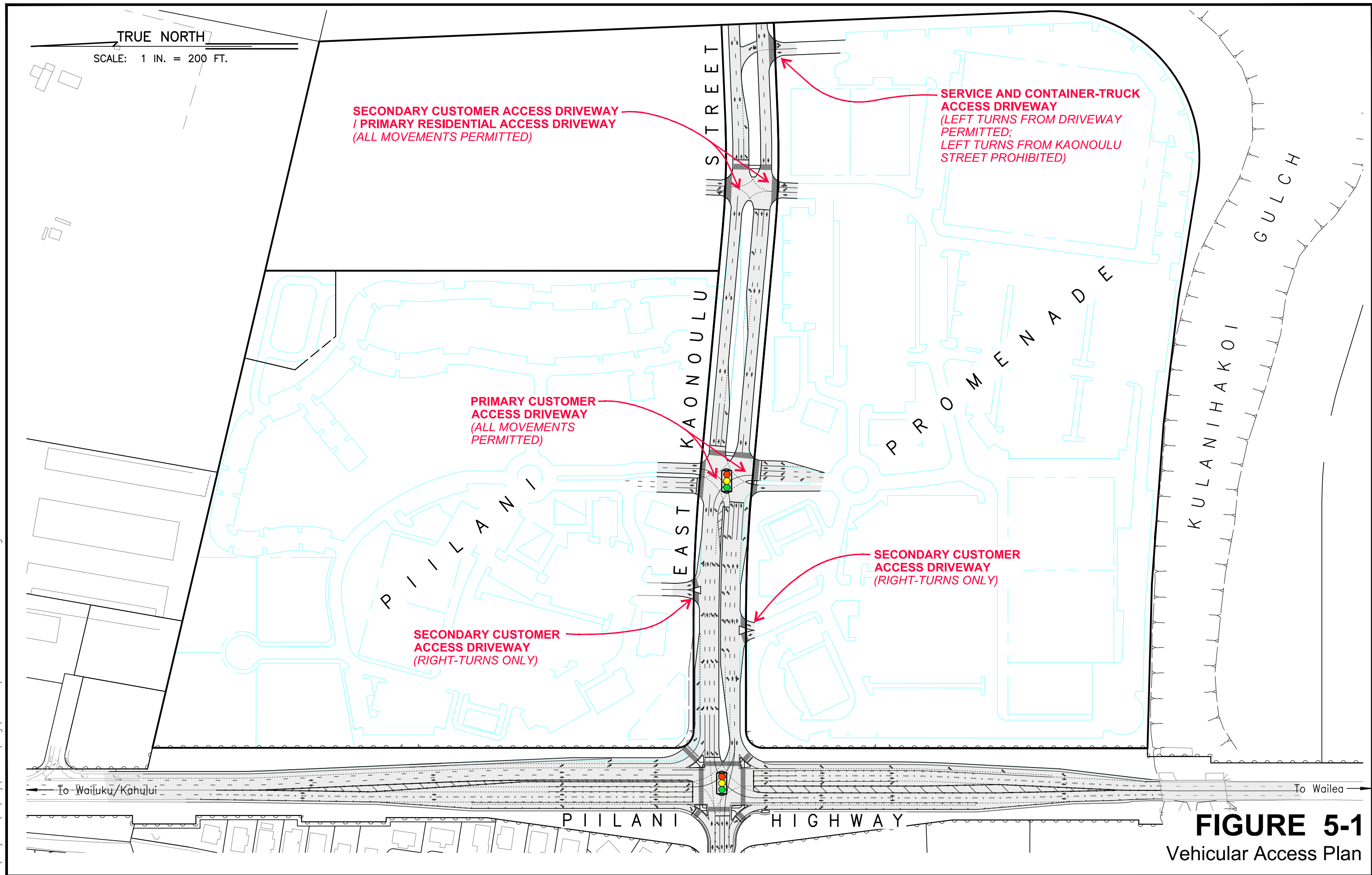
²⁷ SSFM International, *Pi'ilani Promenade Traffic Impact Analysis Report Update*, Kihei, Maui, December 20, 2016, p. 59.

bicycle lanes along Piilani Highway to provide connectivity with the rest of Kihei.

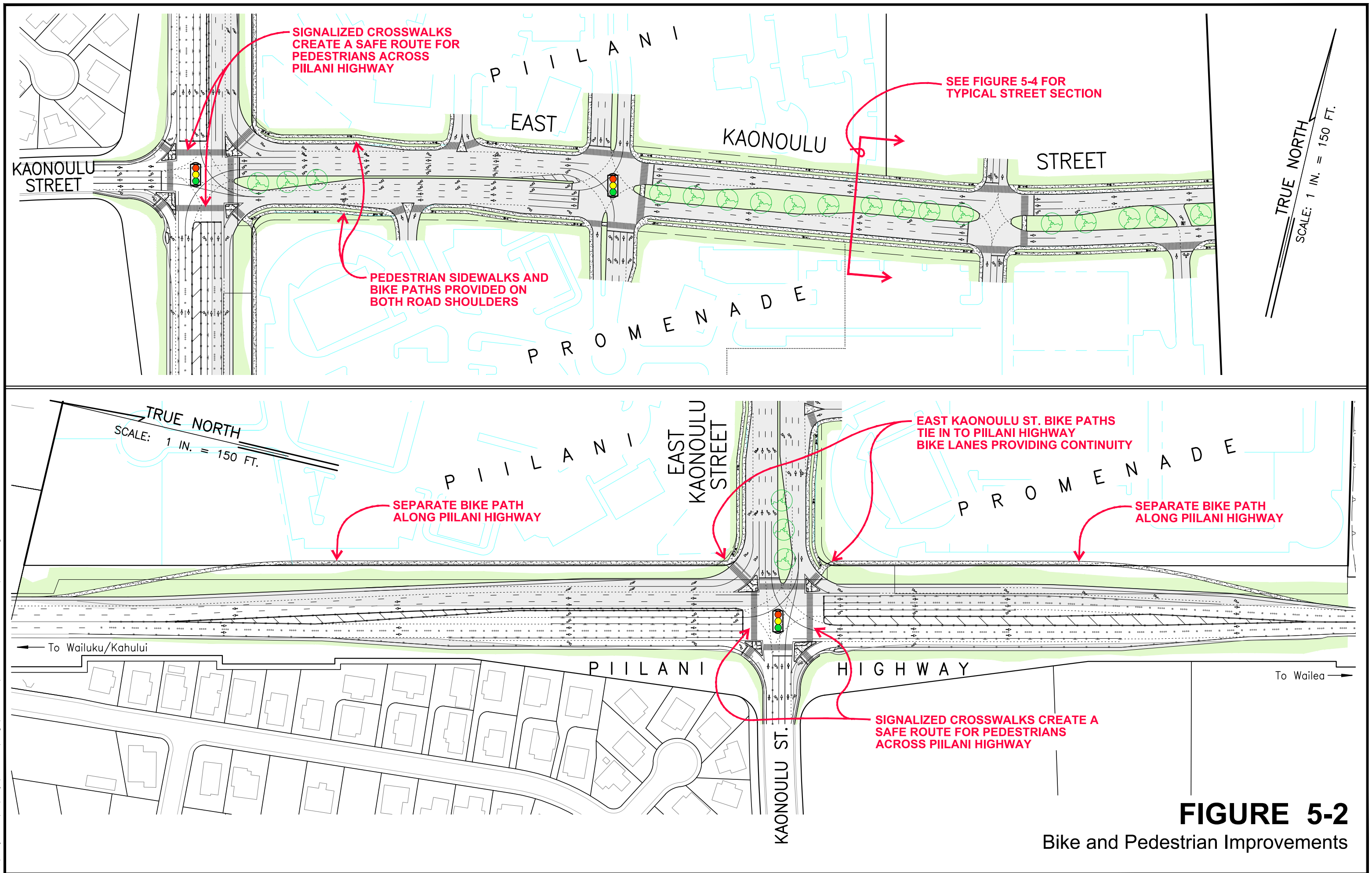
- The new signalized intersection at Kaonoulu Street will include crosswalks enabling pedestrians from the residential area below Piilani Highway to cross the Highway safely.
- A separate bike path running parallel to Piilani Highway will be constructed within the Piilani Promenade development.

Among the improvements will also be a gated, 20-foot wide paved bike and pedestrian way which will be constructed from Ohukai Road to East Kaonoulu Street within the 44-foot wide Access and Utility Easement obtained from Haleakala Ranch to provide a more direct link between Piilani Promenade and the residential area to the north of the development.²⁸ (See Figure 5-4)

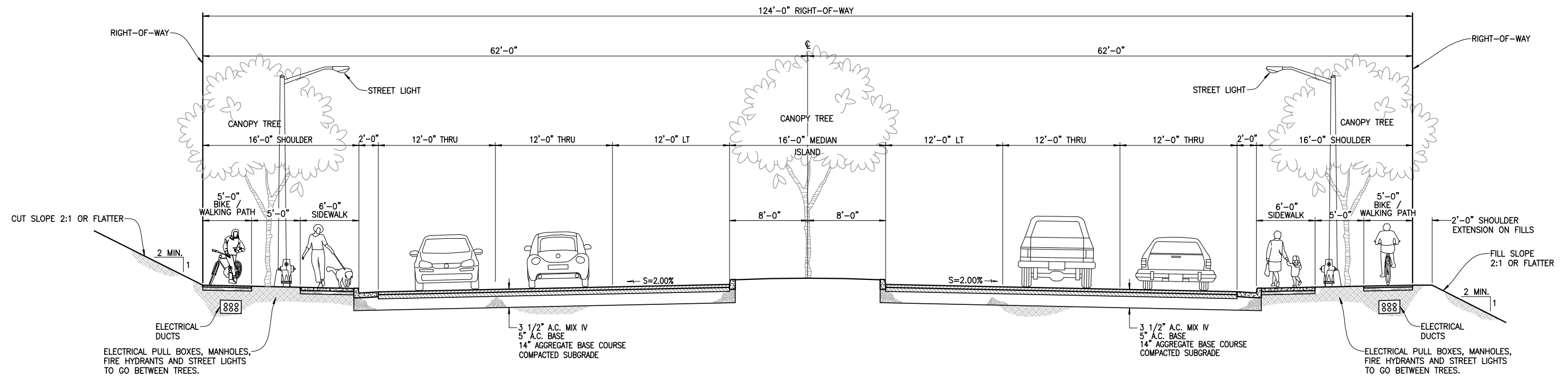
²⁸ The paved bike and pedestrian way will also be used to enable service and maintenance vehicles to access the drainage channel and culvert improvements located on TMK 2-2-02: 82, the irrigation pump station on Lot 2B, and the new 1.0 MG water tank site. Maintenance vehicle access over the bike and pedestrian way will be limited to authorized personnel during normal daylight working hours and emergencies in order to minimize noise and traffic nuisance to the existing residences along Ohukai Road.



V:\Projdata\13proj\13037\dwg\exhibits\Bike-Pedestrian-imp-00.dwg



V:\Projdata\13proj\13037\dwg\exhibits\Typ-Sec-Kaonoulu St-Ext-00.dwg



TYPICAL SECTION ALONG EAST KAONOULU STREET

SCALE: 3/32" = 1'-0"

FIGURE 5-3

Typical Section Along East Kaonoulu Street

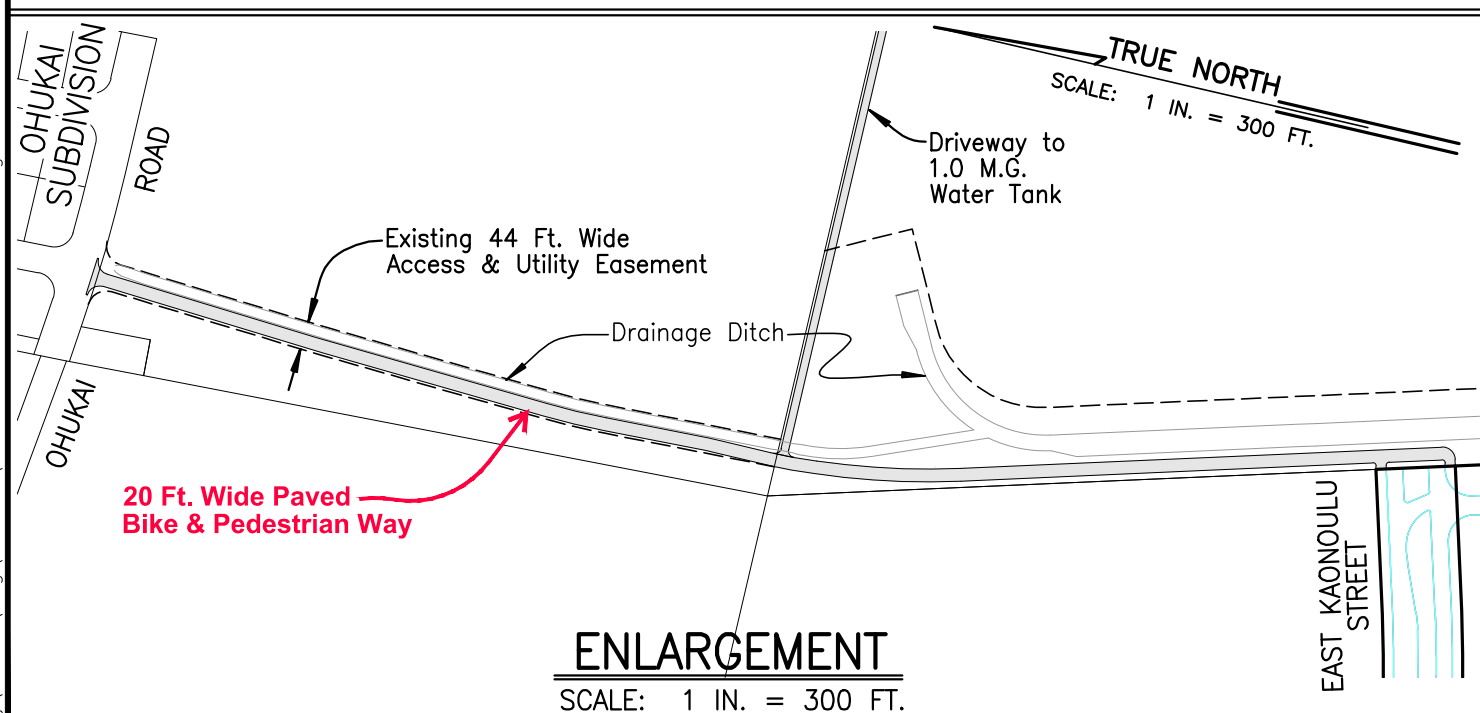
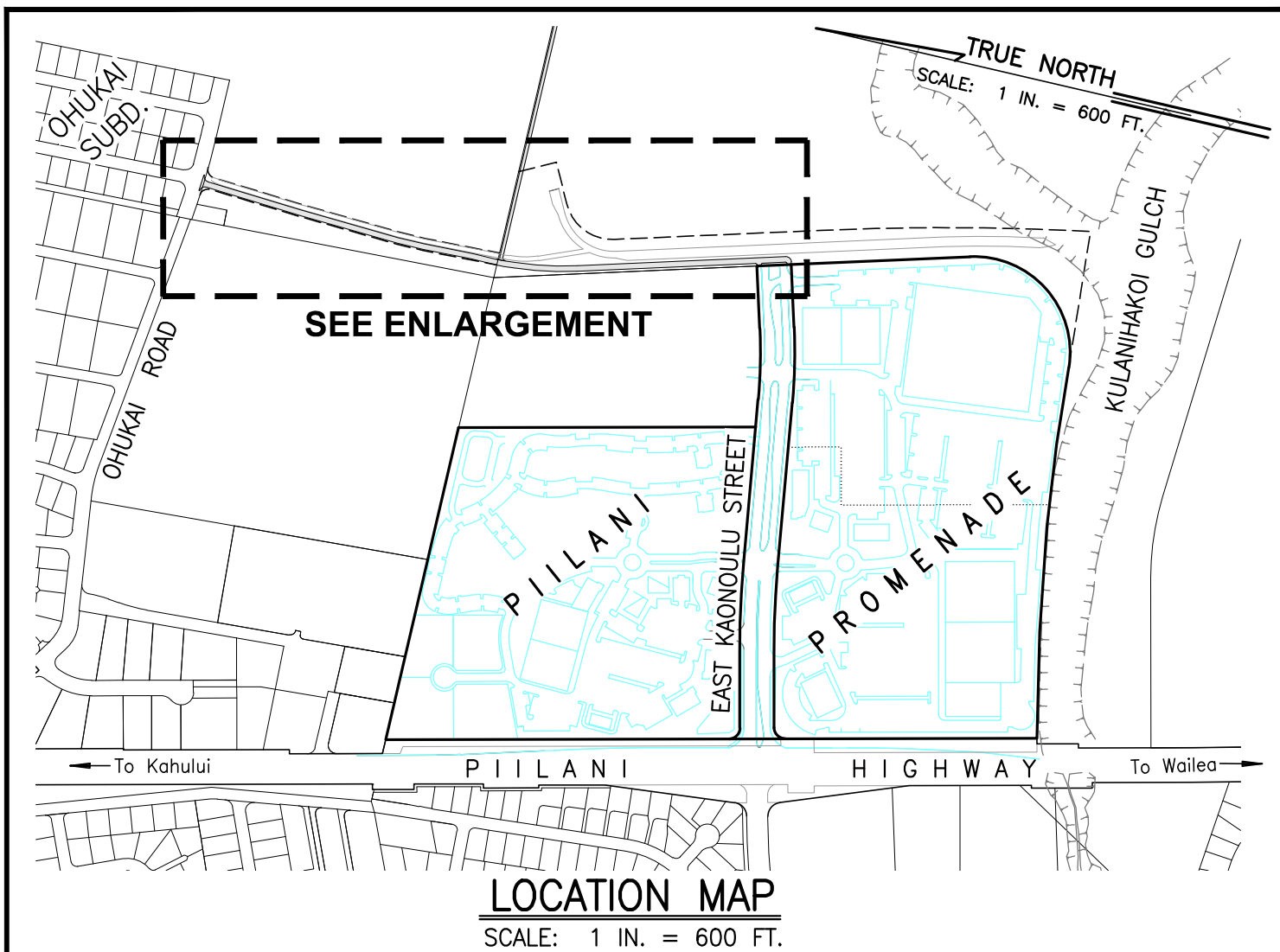


FIGURE 5-4

Bike & Pedestrian Way from Ohukai Road to East Kaonoulu Street

6. POWER AND TELECOMMUNICATIONS²⁹

6.1 Maui Electric Company Power System

There are no existing MECo power sources in the immediate vicinity of the proposed development. The closest existing MECo power source is an overhead 69 kV and 12 kV pole line running through the existing subdivision just makai of Piilani Highway. The 69 kV is part of MECo's transmission loop for the Island of Maui, and is the nearest source of large power. The 12 kV pole lines provide distribution power to existing commercial and residential developments in the area. However, MECo has advised that the existing 12 kV system does not have sufficient spare capacity to accommodate the estimated 6,250 kVA of load required by the current Piilani Promenade development plan.

Maui Electric Company is planning a new substation to provide the additional capacity needed to accommodate further growth in the north Kihei area. The new substation will be located in the northwest corner of the Piilani Promenade development, and will be fed by an overhead 69 kV line extension across Piilani Highway, which will be tapped into MECo's transmission loop pole line below the Highway. (See Figure 6-1) Public Utilities Commission (PUC) review and approval are required for MECo's new substation.

The substation will contain two (2) MECo transformers to step down the voltage from 69 kV to 12 kV for local distribution. A new 12 kV concrete-encased underground ductline and manholes will be provided to extend power from the substation, along the

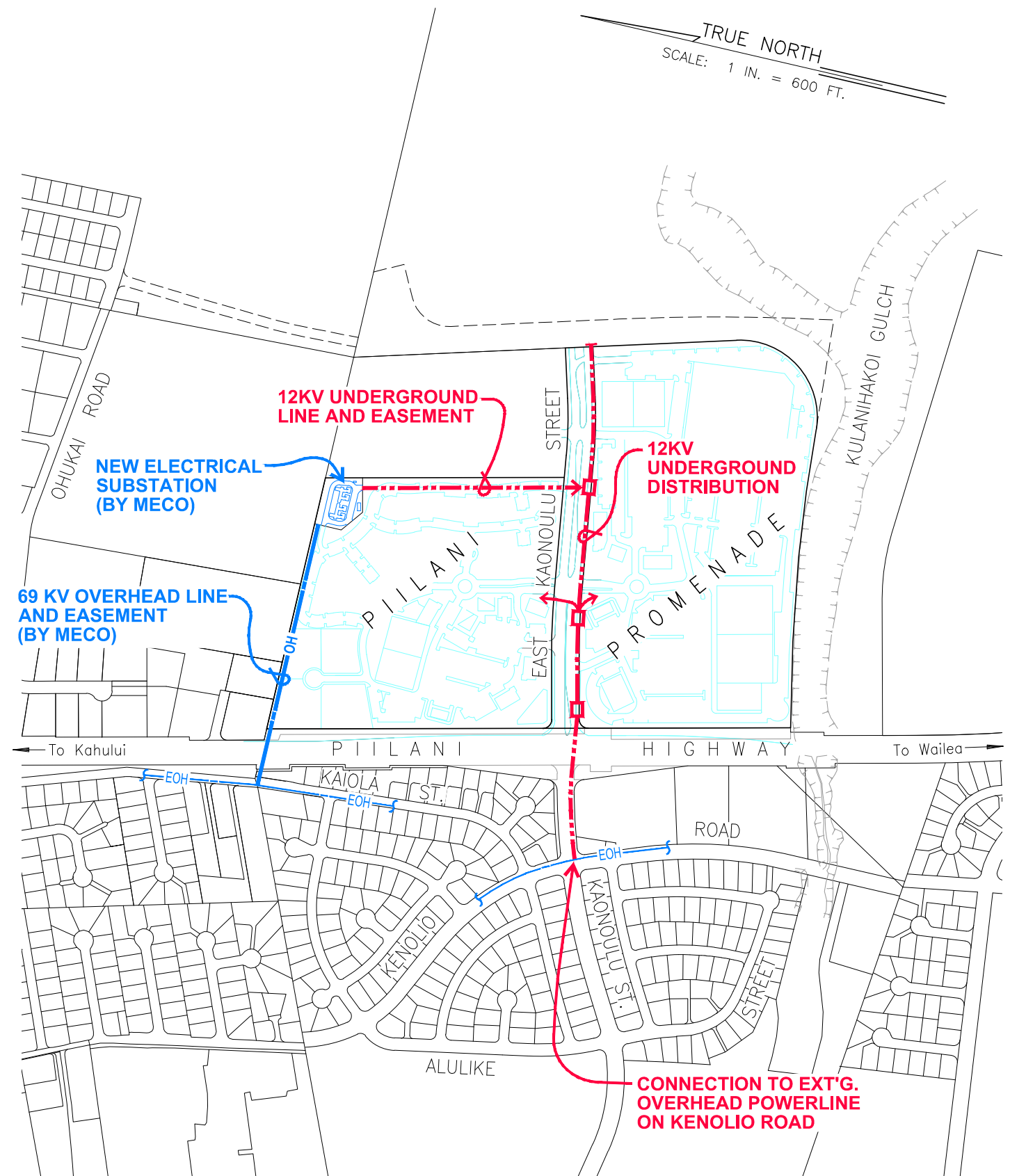
²⁹Discussion provided by ECS, Inc.

north boundary of the residential site, and to a major ductline along Kaonoulu Street extension. Stubouts for 12 kV distribution will be provided at each bulk-lot for future on-site distribution. All distribution will be underground, including wiring along East Kaonoulu Street for MECo's street lighting system.

6.2 Telephone and CATV System

Hawaiian Telcom (HT) and Oceanic Time Warner Cable (OTWC) also do not have any existing telecommunications facilities in the immediate vicinity of the proposed development. The closest source of telephone and CATV service is MECo's 69 kV pole line, which runs below Piilani Highway. It is proposed to build an underground ductline extension from the existing 69 kV pole line, across Piilani Highway, and underground along Kaonoulu Street extension. Conduit stubouts will be provided for each bulk-lot for future on-site distribution.

HT and OTWC will provide the fiber optic cables in the ductlines on an as-needed basis. No Central Offices or electronic equipment pads are anticipated. However, small cross connects and CATV node pads may be required along Kaonoulu Street. As with MECo, all distribution will be underground.



LEGEND:

- CONSTRUCTED BY PIILANI PROMENADE
- CONSTRUCTED BY MAUI ELECTRIC CO.

FIGURE 6-1
Electrical Power Improvements