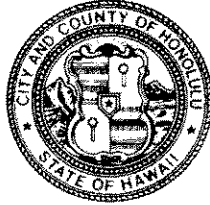


DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 11<sup>TH</sup> FLOOR  
HONOLULU, HAWAII 96813  
Phone: (808) 523-4564 • Fax: (808) 523-4567  
Web site: [www.honolulu.gov](http://www.honolulu.gov)



MUFI HANNEMANN  
MAYOR

DIRECTOR  
EUGENE C. LEE, P.E.  
DEPUTY DIRECTOR

WW.P 06-068

March 29, 2006

Ms. Genevieve Salmonson, Director  
Office of Environmental Quality Control  
235 South Beretania Street, Suite 702  
Honolulu, HI 96813

RECEIVED  
06 MAR 29 11:45  
OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

Dear Ms. Salmonson:

Subject: Finding of No Significant Impact (FONSI)  
for the Wanaao Road/Keolu Drive Reconstructed Sewer  
Kailua, Oahu, Hawaii  
TMK: 4-2-19, 21-22, 24-25, 27-30, 39-41, 46, 49-50, 75, and 80

The Department of Design and Construction has reviewed the comments received during the 30-day public comment period, which began on February 8, 2006. We have determined that this project will not have significant environmental effects and have issued a FONSI. Please publish this notice in the next available *Environmental Notice*.

We have enclosed a completed OEQC Publication Form and four copies of the Final EA. Please contact project manager, Carl Arakaki, at 523-4671 or our consultant, Nancy Nishikawa with Kimura International, Inc., at 944-8848, if you have any questions.

Very truly yours,

A handwritten signature in black ink, appearing to read "Eugene C. Lee".

Eugene C. Lee, P.E.  
Deputy Director

Enclosures

c: Glenn Kimura, Kimura International, Inc.

2006-04-08 0A FEA WANAAO ROAD- KEOLU DRIVE RECONSTRUCTED SEWER APR - 8 2006

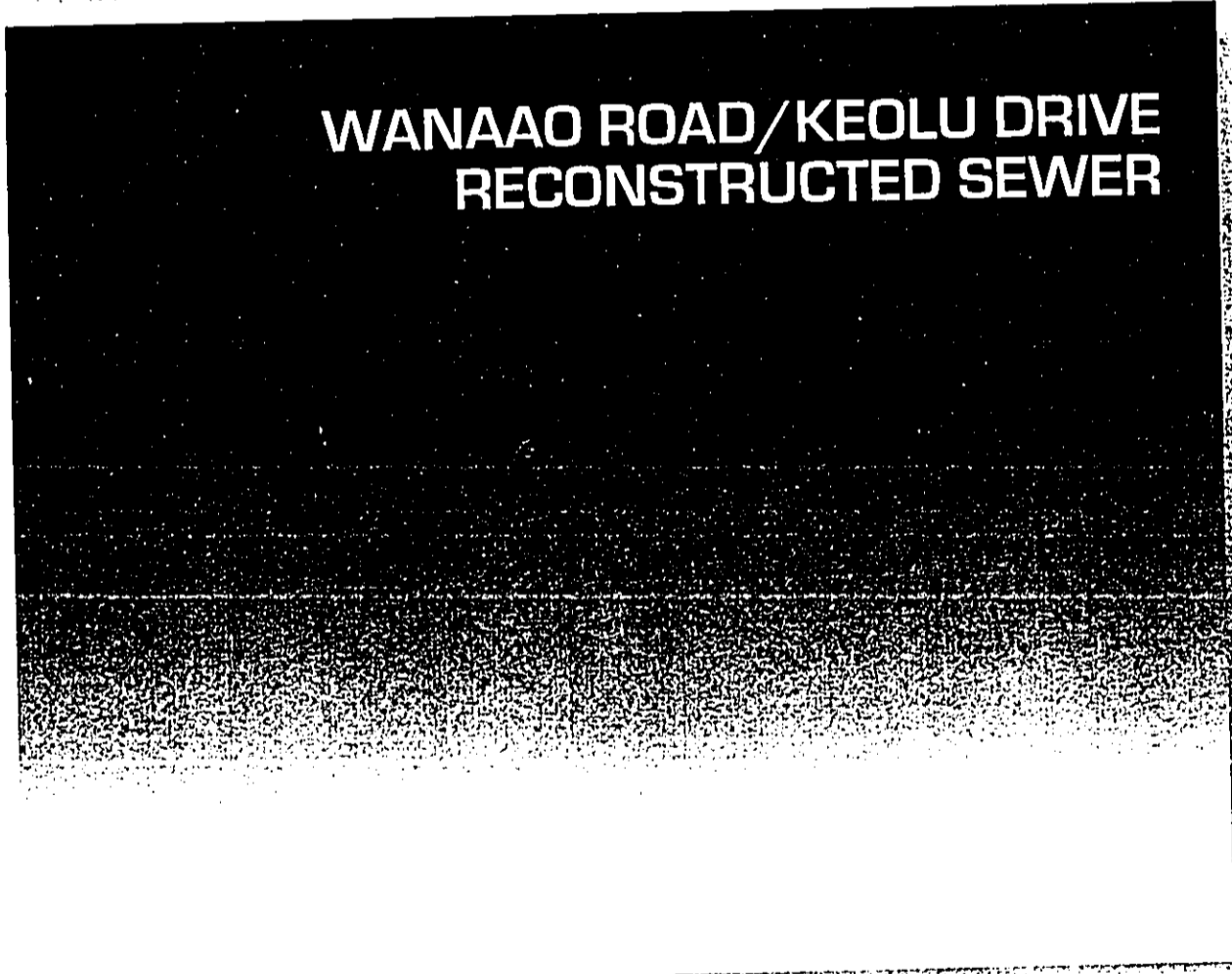
**FILE COPY**

OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

06 MAR 29 AM 11:26

RECEIVED

**FINAL ENVIRONMENTAL ASSESSMENT**



**WANAAO ROAD/KEOLU DRIVE  
RECONSTRUCTED SEWER**

**City and County of Honolulu  
Department of Design and Construction**

March 2006

# **FINAL ENVIRONMENTAL ASSESSMENT**

---

## **Wanaao Road/Keolu Drive Reconstructed Sewer**

TMK: 4-2-19, 21-22, 24-25, 27-30,  
39-41, 46, 49-50, 75, 80

Prepared for:  
Department of Design and Construction  
City and County of Honolulu

Prepared by:  
Kimura International, Inc.

March 2006

**Table of Contents**

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1-1</b>
1.1	Proposing Agency and Action .....	1-1
1.2	Purpose of the Environmental Assessment .....	1-1
1.3	Project Summary .....	1-2
<b>2</b>	<b>PROPOSED ACTION .....</b>	<b>2-1</b>
2.1	Project Overview and Location .....	2-1
2.2	Project Background .....	2-5
2.3	Purpose of and Need for the Project .....	2-6
2.4	Technical Description of the Project .....	2-7
2.4.1	Microtunneling .....	2-8
2.4.2	Horizontal Directional Drilling .....	2-11
2.4.3	Open Trench .....	2-12
2.4.4	Pipeline Support .....	2-12
2.5	Project Cost .....	2-12
2.6	Project Schedule.....	2-12
2.7	Permits Required or Potentially Required .....	2-13
<b>3</b>	<b>AFFECTED ENVIRONMENT .....</b>	<b>3-1</b>
3.1	Physical Environment .....	3-1
3.1.1	Topography, Geology, and Soils .....	3-1
3.1.2	Air Quality and Odors.....	3-5
3.1.3	Natural Hazards .....	3-6
3.1.4	Hydrology and Water Quality.....	3-9
3.1.5	Noise Quality .....	3-13
3.1.6	Hazardous Materials .....	3-15
3.2	Biological Environment .....	3-15
3.2.1	Flora .....	3-15
3.2.2	Fauna .....	3-16
3.3	Socio-economic Environment .....	3-20
3.3.1	Population and Employment .....	3-20
3.3.2	Surrounding Land Uses .....	3-21
3.3.3	Scenic and Visual Land Resources .....	3-21
3.3.4	Archaeological, Historic, and Cultural Resources .....	3-22
3.4	Traffic and Circulation .....	3-24

---

3.5	Public Utilities .....	3-32
3.6	Public Health and Safety.....	3-33
4	<b>LAND USE PLANS, POLICIES, AND CONTROLS.....</b>	<b>4-1</b>
4.1	Hawaii State Plan.....	4-1
4.2	State Land Use Classification .....	4-1
4.3	City and County of Honolulu Land Use Regulations .....	4-3
4.4	Special Management Area .....	4-3
5	<b>ALTERNATIVES .....</b>	<b>5-1</b>
5.1	Design Alternatives .....	5-1
5.1.1	No Action .....	5-1
5.1.2	Rehabilitate and Add .....	5-1
5.1.3	Install and Abandon .....	5-1
5.1.4	Preferred Design Alternative .....	5-2
5.2	Construction Alternatives .....	5-2
5.2.1	Open Trench.....	5-2
5.2.2	Microtunneling .....	5-3
5.2.3	Horizontal Directional Drilling .....	5-3
5.2.4	Preferred Construction Alternative .....	5-3
6	<b>DETERMINATION .....</b>	<b>6-1</b>
7	<b>FINDINGS AND REASONS SUPPORTING THE DETERMINATION .....</b>	<b>7-1</b>
8	<b>BIBLIOGRAPHY .....</b>	<b>8-1</b>
9	<b>CONSULTATION AND COORDINATION .....</b>	<b>9-1</b>
9.1	Individuals and Organizations Consulted during Preparation of the DEA .....	9-1
9.2	Individuals and Organizations Contacted during the DEA Comment Period .....	9-2
<b>APPENDICES</b>		
A	<b>Pre-Assessment Consultation</b>	
B	<b>Public Information Meeting, January 23, 2006</b>	

**LIST OF FIGURES**

1.	Location Map .....	2-2
2.	Proposed Project .....	2-9
3.	Soils .....	3-4
4.	Flood Insurance Rate Map .....	3-7
5.	Traffic Counts: Keolu Drive Northwest Bound .....	3-27
6.	Traffic Counts: Keolu Drive Southeast Bound .....	3-27
7.	Traffic Counts: Wanaao Road Northeast Bound .....	3-29
8.	Traffic Counts: Wanaao Road Southwest Bound .....	3-29
9.	State Land Use Districts .....	4-2
10.	Koolaupoko Sustainable Communities Plan .....	4-5
11.	Zoning .....	4-6
12.	Special Management Area Map .....	4-7

**LIST OF TABLES**

1.	Project Summary .....	1-2
2.	Potential Government Permits and Approvals .....	2-13
3.	Population of Kailua, Oahu, and Hawaii, 1990 and 2000 .....	3-20
4.	Traffic Volume Counts, Keolu Drive at Wanaao Road .....	3-26
5.	Traffic Volume Counts, Wanaao Road at Keolu Drive .....	3-28
6.	Summary of Draft Environmental Assessment Distribution and Comments .....	9-3

**ACRONYMS**

BMP	Best Management Practice
CDP	Census Designated Place
CIP	Capital Improvement Program
CIPP	Cured-in-Place Pipe
DDC	City and County of Honolulu, Department of Design and Construction
DEA	Draft Environmental Assessment
DLNR	State of Hawaii, Department of Land and Natural Resources
DOE	State of Hawaii, Department of Education
DOH	State of Hawaii, Department of Health
EA	Environmental Assessment
EIS	Environmental Impact Statement
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
GPD	Gallons Per Day
HAR	Hawaii Administrative Rules
HDD	Horizontal Directional Drilling
HRS	Hawaii Revised Statutes
LF	Linear Feet
MSL	Mean Sea Level
NPDES	National Pollutant Discharge Elimination System
OEQC	State of Hawaii, Office of Environmental Quality Control
SF	Square Feet
SHPD	State of Hawaii, Historic Preservation Division
SMA	Special Management Area
UBC	Uniform Building Code
WWPS	Wastewater Pump Station
WWTP	Wastewater Treatment Plant

## **1 INTRODUCTION**

### **1.1 PROPOSING AGENCY AND ACTION**

The City and County of Honolulu, Department of Design and Construction (DDC) proposes to replace an existing trunk sewer line through a section of Kailua, in the Koolaupoko District of Oahu. The proposed sewer line will consist of pipes with inside diameters that vary in size from 12 inches to 42 inches. The new trunk line will be installed within portions of Keolu Drive and Wanaao Road. The project will begin at the intersection of Keolu Drive and Akalani Loop/Akahai Street, continue along Keolu Drive to Wanaao Road, then turn onto Wanaao Road. The project will end with a tie-in at the Kailua Heights Wastewater Pump Station (WWPS), located at the corner of Wanaao Road and Auwina Street. The total length of the new line will be approximately 6,600 linear feet or 1.25 mile. The project will also include 8-inch collector lines, manholes, and appurtenant facilities. Following sewer reconstruction, roadways within the project limits will be resurfaced.

### **1.2 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT**

The Environmental Assessment (EA) discloses short- and long-term impacts on the natural and man-made environment that could result from construction and operation of the proposed action. Mitigation measures are proposed when there is a potential for adverse impacts.

This EA has been prepared to satisfy the requirements of Chapter 343, Hawaii Revised Statutes (HRS) and Title 11, Chapter 200, Environmental Impact Statement (EIS) Rules of the Hawaii Administrative Rules (HAR).

The proposed action has triggered the rules and regulations for environmental review because it will be financed by the City and County of Honolulu with public funds and will use public land within the right-of-way of City streets. Kaelepulu Stream lies within the Conservation District and the State Office of Conservation and Coastal Lands has determined that a Conservation District Use Permit is required.

The environmental review process allows for three courses of action depending on a project's anticipated level of environmental impact. The first course would be an "exemption" from environmental review according to the HAR Chapter 200, EIS Rules.

The second course of action applies to projects whose environmental impacts would not be "significant." The term "significant" has a technical definition under HAR Chapter 200. For projects lacking a "significant" environmental impact, an Environmental Assessment is prepared and is the appropriate environmental review document. Pre-assessment comments for this project led to a determination that sewer line improvements would not cause significant impacts, or would have adverse impacts that could be mitigated to less than significant levels. Therefore,



a DEA was prepared for the proposed action. Findings of the DEA were used to determine the project's significance. The bases for concluding that the project's impacts will not be significant under HRS 343 are provided in Chapter 7.

The third course of action applies to projects expected to have a "significant" impact on the environment. For such projects, an Environmental Impact Statement (EIS) is prepared, and is the appropriate environmental review document. Since the impacts of the proposed project will not be "significant," an EIS was not prepared.

### 1.3 PROJECT SUMMARY

Table 1 contains a description of the project and applicable land-use designations.

**Table 1: Project Summary**

Project Name	Wanaao Road/Keolu Drive Reconstructed Sewer
Proposing Agency	Department of Design and Construction, City and County of Honolulu
Project Location	Enchanted Lake, Kailua, Koolaupoko District, Island of Oahu
Approving Agency	Department of Design and Construction, City and County of Honolulu
Determination	Finding of No Significant Impact (FONSI) under Chapter 343, HRS
Property Owners	City and County of Honolulu (streets) Private property owners (sewer easements)
Tax Map Keys	4-2-19, 21-22, 24-25, 27-30, 39-41, 46, 49-50, 75, 80
Existing Uses of the Site	Road right-of-way Abutting uses are residences, businesses, churches, and schools
Proposed Project	Replacement sewer line on Keolu Drive (Akalani Loop/Akahai Street to Wanaano Road) and on Wanaao Road (Keolu Drive to Kailua Heights Wastewater Pump Station)
Length and Diameter of Proposed Pipeline	Length = 6,600 feet or 1.25 miles Diameter = 12- to 42-inches (main); 8-inches (collector)
State Land Use	Urban, except Kaelepulu Stream which is in the Conservation District
Zoning	R-5, R-7.5 Residential, B-1 Neighborhood Commercial
SMA Designation	Approx.500 feet, from Paopua Lp to Auwina St (across Kawainui Canal) is within the SMA.

## 2 PROPOSED ACTION

### 2.1 PROJECT OVERVIEW AND LOCATION

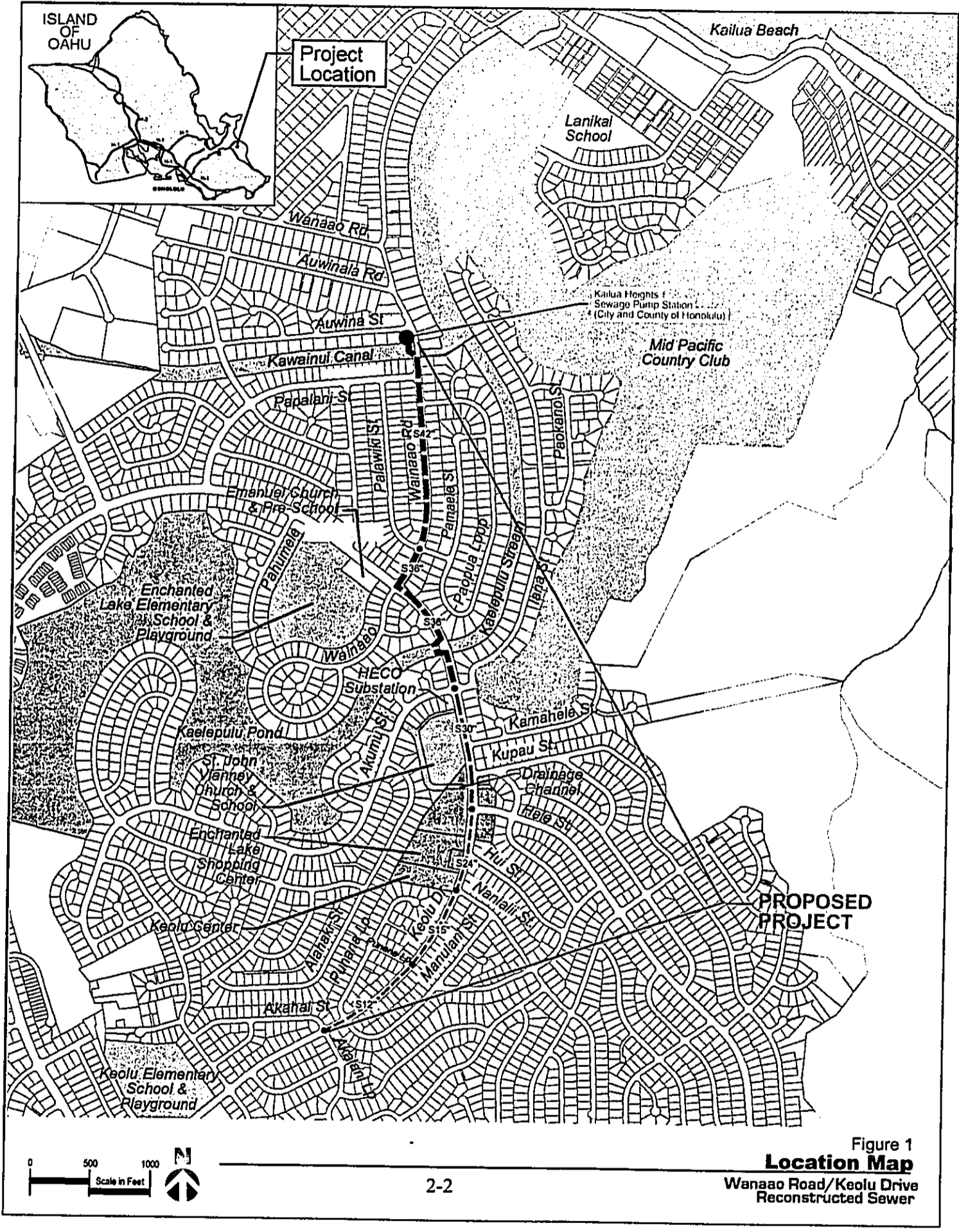
The City and County of Honolulu, Department of Design and Construction (DDC) proposes to replace an existing sewer line comprised of vitrified clay pipes and reinforced concrete pipes measuring 8, 12, 21, and 24 inches in diameter. The existing line will be capped and abandoned in place and replaced with new, larger-capacity sewer line ranging in diameter from 12 inches to 42 inches to accommodate current and projected wastewater flows. The new sewer line will follow an alignment that includes portions of Keolu Drive and Wanaao Road (see Figure 1). The project will begin at the intersection of Keolu Drive and Akalani Loop/Akahai Street and continue along Keolu Drive for approximately 4,300 feet. The line will then turn onto Wanaao Road and extend approximately 2,300 feet, ending at the Kailua Heights Wastewater Pump Station (WWPS) located at the corner of Wanaao Road and Auwina Street. In total, the project involves approximately 6,600 linear feet or 1.25 miles of new pipeline.

Once installation of the new trunk line is complete, service laterals will be connected with new 8-inch connector lines. The new trunk line will become the server while the existing line will be abandoned in place. As requested by the Department of Facility Management, the DDC is examining the possibility of filling the abandoned pipes with flowable fill or controlled low strength material (CLSM). After construction is completed underground, roadways within the project limits will be fully resurfaced.

Construction will generally occur within the right-of-way of existing streets and easements on private property. All of the streets involved are under the jurisdiction of the City and County of Honolulu. The project will pass beneath three water channels: Kaelepulu Stream, Kawainui Canal, and an unnamed drainage channel located between the Enchanted Lake Shopping Center and a Union Service Station<sup>1</sup>. Kaelepulu Stream is classified in the State Conservation District and the two other waterways are in the Urban District.

The project area contains a mix of residential and commercial uses. Keolu Drive is a looped collector road serving the Enchanted Lake community. Wanaao Road is a residential street, but it also provides one of two links between Enchanted Lake and Kailua Town. The proposed sewer line will pass through a commercial area, which includes two shopping centers, Keolu Center and Enchanted Lake Center, and neighborhood businesses arrayed on both sides Keolu Drive. There are several institutions abutting or near the Keolu Drive segment of the project area, including St. John Vianney Church and School, Emmanuel Church and Pre-School, and Enchanted Lake Elementary School and Playground. A Hawaiian Electric Co. substation is located at the corner of Keolu Drive and Iana Street. Residences abutting Keolu Drive and Wanaao Road are detached, one- and two-story homes.

<sup>1</sup> Names of waterways used in this DEA are based on engravings on bridge structures. Kaelepulu Stream is also known as Kaelepulu Canal. Kawainui Canal is also known as Hamakua Canal.



ISLAND OF OAHU

Project Location

Kailua Beach

Lanikai School

Wanao Rd

Auwinala Rd

Auwina St

Kawainui Canal

Kailua Heights Sewage Pump Station (City and County of Honolulu)

Mid Pacific Country Club

Papalahi St

Palawiki St

Wanao Rd

Wanao St

Palawiki St

Peopua Loop

Kaelepulu Street

Kamahele St

Enchanted Lake Elementary School & Playground

Emmanuel Church & Prep School

HECO Substation

Kaelepulu Pond

St. John Yanney Church & School

Enchanted Lake Shopping Center

Keolu Center

PROPOSED PROJECT



Figure 1  
**Location Map**  
 Wanao Road/Keolu Drive  
 Reconstructed Sewer

# DOCUMENT CAPTURED AS RECEIVED

Wanaao Road/Keolu Drive Reconstructed Sewer  
Final Environmental Assessment

Chapter 2  
Proposed Action



Keolu Drive at Akahai Street (left) and Akalani Loop (right)  
Up gradient end of project alignment



Enchanted Lake commercial area on Keolu Drive

# DOCUMENT CAPTURED AS RECEIVED

Wanaao Road/Keolu Drive Reconstructed Sewer  
Final Environmental Assessment

Chapter 2  
Proposed Action



Residences on Wanaao Road



Kailua Heights Wastewater Pump Station at Wanaao Road and Auwina Street  
Down gradient end of project alignment

## 2.2 PROJECT BACKGROUND

### *Pipe Characteristics*

The wastewater collection system in Kailua was built incrementally between 1954 and 1969. Many of the lines consist of unlined, reinforced concrete pipe that are vulnerable to structural and corrosion failures. Existing sewer lines in the project area were constructed in 1956 as part of the infrastructure system for Enchanted Lake, a newly developing bedroom community in Windward Oahu.

The "Islandwide Sewer Adequacy Project" by Akinaka/Fukunaga Engineering Joint Venture, dated July 1989, indicated that sections of the Kailua wastewater collection system were hydraulically inadequate based on the project land use of the City and County's Koolaupoko Development Plan (since updated and renamed the Koolaupoko Sustainable Communities Plan). That study found that the existing collection system is inadequate to handle current and future peak flows.

Additional studies involving the Ahuimanu/Kaneohe/Kailua area focused on the infiltration/inflow conditions of the wastewater system. Smoke testing "Kailua and Kaneohe-Ahuimanu Smoke Testing Report" by Barrett Consulting Group, dated April 1993 and an infiltration/inflow study "Ahuimanu-Kaneohe-Kailua Infiltration/Inflow Report" by Barrett Consulting Group, dated March 1992 contributed to the awareness of the system's physical status.

### *Planning Background*

In 1995, the City and County of Honolulu entered a consent decree that stemmed from civil action filed for alleged environmental violations cause by discharges at the Kailua and Kaneohe Wastewater Treatment Plants (WWTPs). Among the remedies provided by the consent decree, the City agreed to prepare a Facilities Plan to address long-term needs for wastewater collection and disposal in the Windward region. Work on the plan began soon after and following a series of draft documents and extensive public outreach, the Final Kailua-Kaneohe-Kahaluu Facilities Plan was approved by the Department of Environmental Services in September 1998.

The Facilities Plan recommended changes to the WWTP, flow equalization facilities, and collection system lines. The Wanaao Road Sewer Replacement project was not mentioned specifically; however, the Facilities Plan refers to the rehabilitation and/or replacement of structurally deteriorated sewers and lines in Kailua.

To fulfill another requirement of the consent decree, the City embarked on a twenty-year Capital Improvement Project (CIP) Program to upgrade and improve its aging sewer system. The CIP Program prioritizes areas that require rehabilitation of existing sewer lines.

The need for the current sewer replacement project was first identified in the preliminary engineering report for the Kalaheo Avenue Relief Sewer dated August 1995. The gravity sewer from Akumu Street to the Kailua Heights WWPS along Keolu Drive was found to be heavily deteriorated and hydraulically inadequate. Spill analysis indicated four wet weather spills occurred in 1998 in the 21-inch line located on Keolu Drive between Akumu Street and Naniiali Street.

A subsequent field study was conducted of the existing sewer system along Keolu Drive and Wanaao road. Completed in 2000, the Wanaao Road Sewer Study found that sections of the pipe line are positioned in a non-positive flow direction; in other words, pipes are not aligned in a downward position to allow gravity to take fluids to the desired destinations. Peak flows exceed the sewer pipe capacity, so that some pipes are currently surcharged or overloaded. Closed circuit television tapes further revealed a high degree of infiltration and pipe corrosion. Several of the lines contained grease. Some sections showed exposed rebar, holes in the sewer line, and sags in the pipe.

### 2.3 PURPOSE OF AND NEED FOR THE PROJECT

Due to the inadequacies of the existing sewer line, the DDC has proposed installing a new, larger capacity sewer line. Replacement will eliminate sags in some sections of the pipeline caused by differential settlement of the underlying soils. Restoring proper gradient to the gravity flow system will ensure wastewater flow velocities necessary for "self-cleaning." Sags have also allowed sewer gases to accumulate, thereby contributing to corrosion. New pipes will address the structural concerns and eliminate the probability of deteriorated pipe sections collapsing. Further, pipes constructed from modern materials will better prevent stormwater influent from entering and surcharging the sewer lines, thereby reducing the risk of future overflows and the need for bypasses.

Deficiencies in the existing sewer line have resulted in the need for constant maintenance to remove grease, grit, and other debris that accumulate at or near low points in the line. Frequent sewer cleaning is required to avoid sewage spills and backups due to clogged lines. The high degree of maintenance is labor intensive and costly. Odor complaints are often associated with cleaning activities.

## 2.4 TECHNICAL DESCRIPTION OF THE PROJECT

The project will replace the existing sewer line along Keolu Drive from Akalani Loop/Akahai Street to Wanaao Road, and along Wanaao Road to the Kailua Heights Wastewater Pump Station at the intersection with Auwina Street (see Figure 2). Approximately 6,600 linear feet or 1.25 mile of pipes, ranging in diameter from 12 to 42 inches, will be installed in this corridor. The replacement pipe will connect downstream to the pump station, and upstream to an existing 8-inch pipe. In general the proposed new sewer will parallel the existing line, approximately 5 to 16 feet in horizontal distance from the outer diameter of the existing sewer. Upon completion of the new trunk line, the existing line will be abandoned in place, possibly after being filled with flowable fill or controlled low strength material (CLSM).

The crown of the newly installed sewer line will be about 8 to 18 feet beneath the existing ground surface. To allow for gravity flow, pipes at the downstream end of the alignment will have the greatest amount of cover, while those at the upstream end will have the least cover. The new sewer at the upstream end will have an inside diameter of 12 inches. The inside diameter of the new sewer will incrementally increase from 15 inches to 42 inches as the sewer collects increasing amounts of wastewater and proceeds to the down gradient end.

The new sewer line will include a 36-inch sewer line crossing under the Kaelepulu Stream and two 30-inch sewer lines under Kawainui Canal. Kaelepulu Stream is approximately 92 feet across at street level, and reaches a depth of approximately 18 feet deep at the deepest point of the sewer line invert. Kawainui Canal is approximately 105 feet across at street level, and approximately 14 feet deep along the proposed sewer line crossing, with a mudline elevation of approximately 7 feet below mean sea level (MSL).

New 8-inch collection lines will be installed to collect sewage from laterals (pipes running from individual properties) and chimneys and connect to the larger trunk line. New manholes will be constructed over the new alignment, and those that are no longer needed will be demolished.

Bypassing of wastewater flows will be required during the project to assure continuous sewage service. The Contractor will provide and operate temporary facilities including plugs, pumps, and other equipment necessary to intercept sewage flow before it reaches the work area, carry it past his work area, and return it to the existing sewer at a point downstream. Where bypass pumping is required, the work will not damage private or public property or create a public nuisance. The Contractor will take measures to prevent excessive sewer surcharging and will not dump or allow sewage flow on private property, gutters, streets, sidewalks, or storm sewers. The bypass lines generally will be installed above ground except at driveway and street crossings, where they will be installed at shallow depths to minimize impacts to traffic flow. Noise from bypass pumps will be in compliance with applicable noise level restrictions or will be dampened.

Portions of Keolu Drive and Wanaao Road that are located within the project limits will be rehabilitated after sewer construction. This work will include cold planning, resurfacing and



# DOCUMENT CAPTURED AS RECEIVED

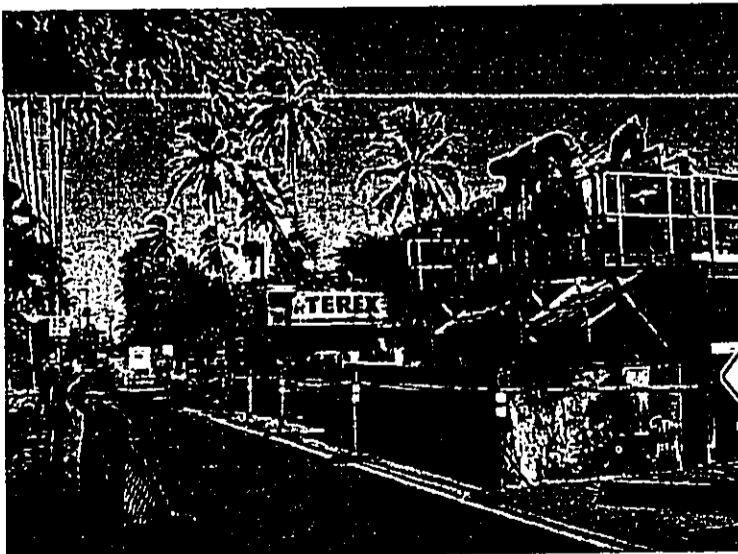
reconstructing asphalt concrete pavements, adjusting utility manhole frames and covers, installing vehicle loop detectors and applying pavement markings.

Installation of the proposed pipeline may utilize several construction methods. However, microtunneling is expected to be the primary construction method. Sections of the pipeline at higher elevations may use the open trench construction method. Horizontal directional drilling is proposed for pipe installation beneath Kaelepulu Stream due to the inverted siphon profile.

## 2.4.1 Microtunneling

Microtunneling will be used to install the sewer pipes in the low-lying reaches of the project area where subsurface soil and groundwater conditions would make conventional open trenching very difficult and more expensive. This method will also be used in the commercial district and other areas with high traffic volumes, where access is needed to driveways and cross streets.

**Construction Staging Area.** Construction staging areas will be established at several points along the alignment. The jacking pit refers to a large underground shaft that contains the microtunnel boring machine and is the point from which the pipe is pushed forward. A typical jacking pit site needs space for the jacking pit and, above ground, for the slurry separation plant, muck handling, crane, control cabin, pipe storage, and support facilities such as generator, power pack, and pipe lubrication unit. The receiving pit requires a smaller overall area since its primary purpose is to provide a shaft for retrieving the boring machine. A separate staging area is needed for an on-site concrete plant that supplies jet grouting material. The minimum area required for construction staging around the jacking pit is approximately 50 feet by 100 feet. The jacking pit itself is typically 15 feet wide by 30 feet long, or larger depending on the length of the pipe sections that are installed. The minimum work area required for receiving pits is approximately 30 feet by 40 feet.



Microtunneling construction staging area on Kalaheo Avenue

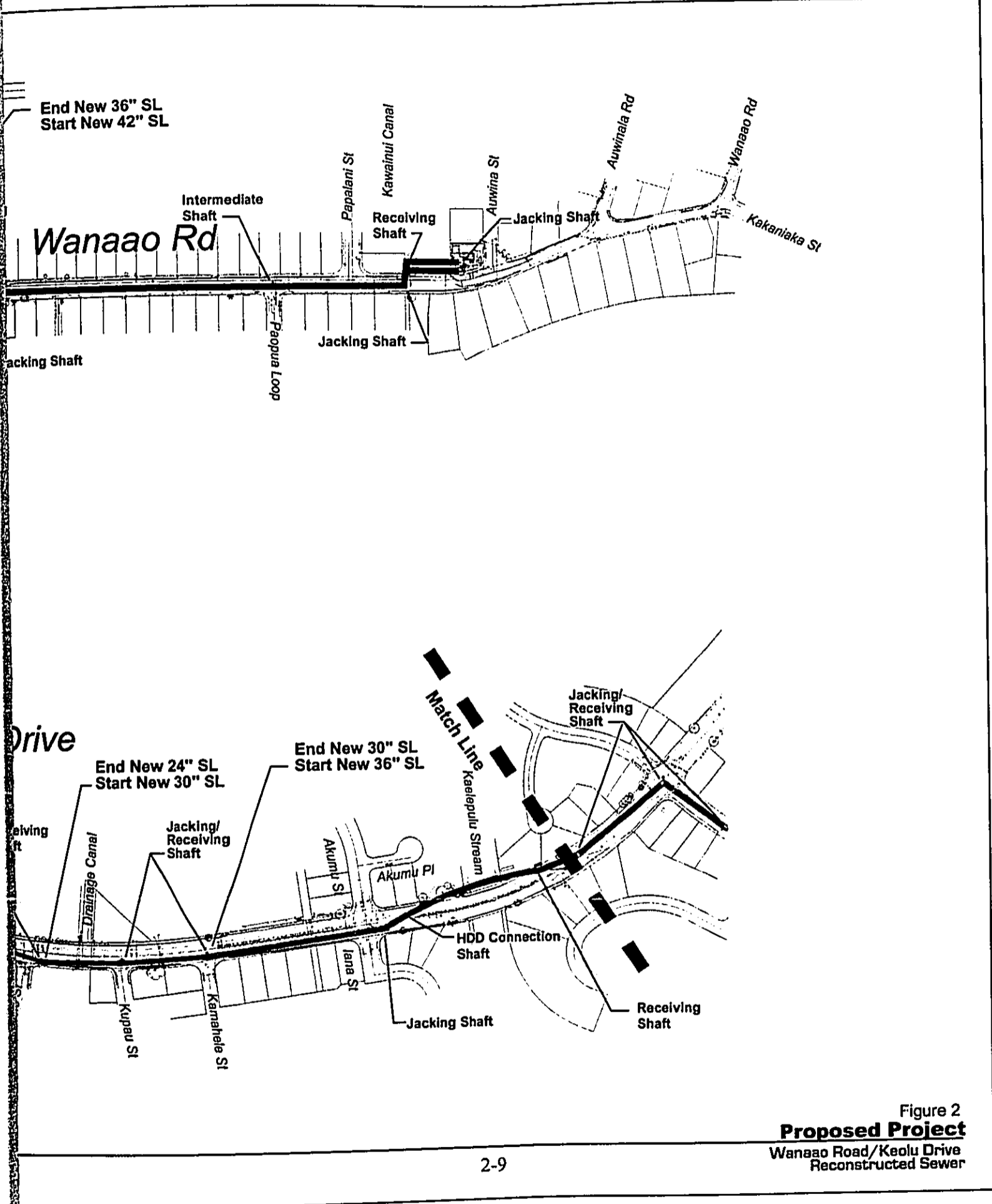
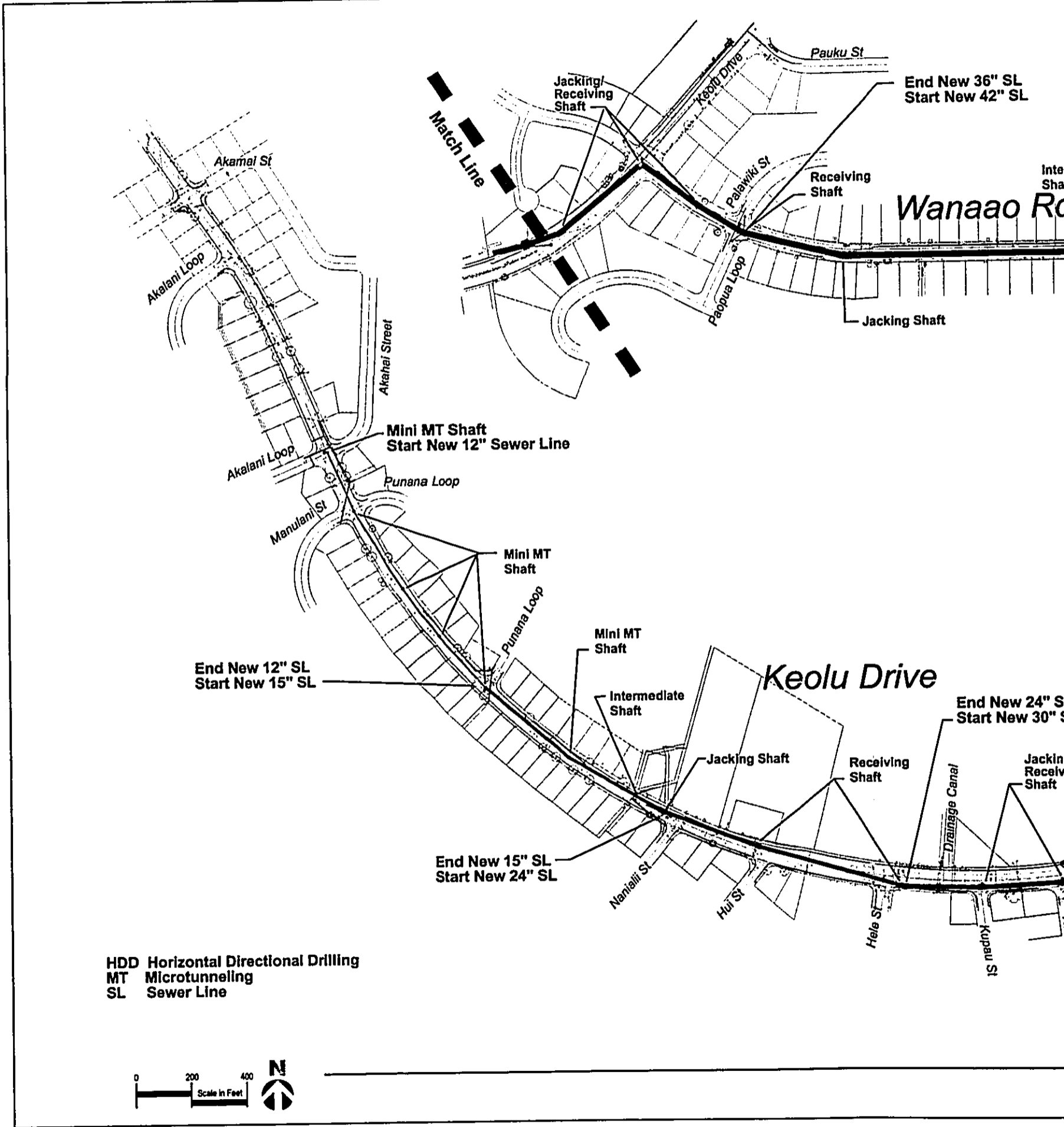


Figure 2  
**Proposed Project**  
 Wanaao Road/Keolu Drive  
 Reconstructed Sewer



HDD Horizontal Directional Drilling  
 MT Microtunneling  
 SL Sewer Line

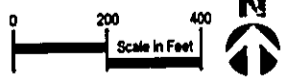


Figure 2 shows the sites proposed for jacking and receiving pits. Factors considered in selecting these sites were:

- Maximum microtunneling drive lengths (400-1,500 feet for pipes 30 inches in diameter or larger. When drive lengths exceed 400-800 feet, intermediate jacking stations must be used to distribute the jacking load along the pipe string.)
- "Bends" in the alignment, since microtunneling installs pipes in a straight line
- Manhole locations
- Locations that minimize impacts to traffic ingress and egress from driveways

Staging areas will remain in place on a 24-hour basis until the segment is completed. Because the jacking pit has extensive equipment requirements, it is located in as few places as possible. To minimize the need to relocate the microtunneling equipment, pipes will be laid in one direction, then the equipment will be turned around to install pipes in the opposite direction.

**Spoils Disposal.** Spoils resulting from microtunneling operations will include water, soil, and drilling fluid additives (if used). To maintain a clean site and to facilitate more rapid separation and disposal, the microtunneling operation will include a slurry separation plant with shakers, screens, and cyclones. In this process, the spoils are transported directly into the plant that separates fine sand and gravels. Liquid material is recycled for use by the microtunneling boring machine. Solids are taken off-site for testing and stockpiling, then disposed of at a site approved by the City and County.

#### 2.4.2 Horizontal Directional Drilling

Due to easement and other physical space limitations, a bending radius to avoid bridge piers, and the lack of adequate ground cover beneath Kaelepulu Stream, horizontal directional drilling (HDD) will be used to install a siphon sewer.

**Construction Staging Area.** The minimum construction work and staging area at the entry and exit locations for HDD is an area approximately 20 feet by 150 feet. Adequate space must be temporarily provided on one side of the stream crossing to fuse and lay the entire pipe string for the pull back. Additional staging area is required for pipe storage, slurry separation systems, and spoils handling with dewatering. To expedite the construction process, a 24-hour staging area would be set up for the drill rig, slurry separation plant, and related support facilities. The minimum area required for the 24 hour staging is 10 feet by 100 feet. If the Contractor is required to remove the drilling rig offsite at the end of each workday, it would substantially increase construction costs and extend the construction period.

**Sewer Easements.** The DDC is in the process of acquiring permanent sewer easements to allow ingress and egress for installation of the sewer siphon lines under Kaelepulu Stream and for future maintenance, repair, or replacement work to these lines. The affected properties are TMKs 4-2-050: 076 (1,081 SF), 4-2-050: 075 (138 SF), and 4-2-049: 010 (1,472 SF).

**Spoils Disposal.** Spoils handling and disposal are similar to those for microtunneling.

### 2.4.3 Open Trench Method

Open trenching is a possibility along the higher elevation portion of the new sewer alignment due to the anticipated presence of stiff alluvium, relatively lower water table, and different required pipe sizes. Along the remaining alignment in lower elevations, open trench or shaft excavations are expected to be slow and difficult due to the need to control groundwater inflow into the excavation and full perimeter support of the excavation against flowable sands and other soft lagoonal soils.

Even if trenchless methods are used for most of the alignment, open trench excavations will still be necessary in local areas for lateral connections and chimney connections.

### 2.4.4 Pipeline Support

To provide long-term support for the new sewer line and minimize future settlement of the sewer pipeline and manholes, the sewer will be supported by stabilizing the compressible soils using jet grouting. Jet grouting refers to construction techniques that use high-pressure fluids or binders (mud and cement, sometimes mixed with bentonite clay) that are injected into the soil at high velocities to form support columns. While the columns extend down through the soft, loose deposits into firmer bearing materials, the microtunneled pipeline is aligned in a perpendicular direction through the jet grout columns. This approach would be similar to methods used for construction of the Nimitz Highway Relief Sewer and the Kainehe Street, Hamakua Drive, and Keolu Drive Reconstructed Sewer.

For sections where open trench methods are used, lightweight backfill can reduce the amount of new loads on the compressible soils. If no pipeline support is provided, such as for the sewer laterals, pipe materials that are capable of tolerating wide differential settlements between pipe segments and pipe-to-manhole connections would be used.

## 2.5 PROJECT COST

The estimated construction cost is \$29.5 million (in 2005 dollars). Funds will be budgeted through the City and County of Honolulu's sewer service charge program.

## 2.6 PROJECT SCHEDULE

The project is tentatively scheduled to open bids in the 4<sup>th</sup> quarter of 2006 with construction expected to begin in 2007. Project completion will require approximately 24 to 30 months.

Specific construction phasing will be left to the Contractor. In general, he can start at any end and could do some preparatory work along other parts of the project alignment which may expedite the construction schedule. It is likely that construction may begin from the down gradient end of the alignment, which is at the Kailua Heights WWPS at Wanaao Road and Auwina Street.

**2.7 PERMITS REQUIRED OR POTENTIALLY REQUIRED**

Governmental permits needed to implement the proposed action are listed in Table 2.

**Table 2: Potential Government Permits and Approvals**

Type	Agency
Department of the Army (DA) Permit Section 10; Section 404	Department of the Army, Corps of Engineers
National Pollutant Discharge Elimination System (NPDES)	State Department of Health, Clean Water Branch
Construction Noise Variance	State Department of Health, Noise, Radiation, and Indoor Air Quality Branch
Coastal Management Zone Consistency Review	Office of State Planning
Conservation District Use Permit	State Department of Land and Natural Resources
Historic Sites Review/Archaeological Monitoring Plan	State Historic Preservation Division. Department of Land and Natural Resources
Major Special Management Area Permit	City and County of Honolulu, Dept. of Planning and Permitting
Street Usage Permit; Construction Dewatering Permit; Permit to Excavate in Public Right- of-way	

### **3 AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIONS**

#### **3.1 PHYSICAL ENVIRONMENT**

##### **3.1.1 Topography, Geology, and Soils**

The project is situated in the Enchanted Lake area, which is in the southeastern portion of the Kailua Regional Wastewater Treatment Plant tributary area. It is flat to moderately sloped with the flat area tending to be near sea level.

The topography at the southwest end of the alignment along Keolu Drive slopes in a northeast direction, with existing ground surface elevations ranging from approximately 33 feet above mean sea level (MSL) at Akahai Street to 9 feet above MSL at Punana Loop. The topography of the remainder of the alignment along Keolu Drive and Wanaao Road is generally level to gently sloping, with existing ground surface elevations ranging from 9 to 10 feet above MSL.

The project area's geology and soil conditions are important elements of the proposed pipeline since past problems with ground settlement have damaged sewer lines and reduced sewer performance. One objective of the project is to avoid similar problems with the new sewers. Satisfactory long-term performance of the new sewer line requires minimizing differential settlement to maintain adequate pipe slopes for satisfactory flow capacity and flow velocity. Soil conditions also affect the ease with which the pipes can be installed, thereby affecting the extent and duration of environmental impacts during construction.

Interpretations of subsurface conditions presented in this EA are based on the results of the explorations completed by Geolabs, Inc (soils and geotechnical subconsultant) and URS and Yogi Kwong Engineers, LLC (underground construction engineering subconsultant). Available geotechnical information indicates that the project area is underlain by a complex sequence of lagoonal, estuarine, and alluvial deposits, residual soils, and extremely weathered basalt. The fluctuations of the sea level have resulted in migrating shorelines, and the formation of eroding channels, which dissected basaltic laval flows and earlier coral and alluvial deposits. Most of these channels in the project area were later filled in by soft lagoonal and estuarine deposits. Substantial man-made fills were placed to raise the ground surface above and surrounding Kaelepulu Pond when the Enchanted Lakes area was originally developed. Due to the complexity of past deposits in the area, variations in subsurface strata, complex interbedding of deposits within short distances—in both vertical and horizontal directions—are expected. In addition, where existing utilities and manholes were constructed near or below the proposed sewer line interval, trench backfills will extend beyond the utilities and further complicate subsurface conditions affecting project design and construction.

The project site contains three types of soils as identified by the USDA Soil Conservation Service. Fill land (FL), Hanalei silty clay (HnA), and Papaa clay (PYE) are explained in full below and shown in (Include map of area and soil types)

***Fill Land, mixed (FL)***

Fill land consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. This type of land is primarily used for urban developments such as airports, housing areas, and industrial facilities.

***Hanalei silty clay, 0 to 2 percent slopes (HnA)***

Hanalei silty clay is primarily found on stream bottoms and flood plains. The surface layer, about 10 inches thick, is composed of dark and very dark gray, silty clay that has dark-brown and reddish mottles. The subsurface layer is about 3 inches thick, and consists of very dark gray and dark-gray silty clay. The subsoil, about 13 inches thick, is mottled, dark gray and dark grayish-brown silty clay that has an angular blocky structure. The substratum is stratified alluvium. The surface layer is strongly to very strongly acidic while the subsoil is neutral. Permeability is moderate, runoff is slow, and the erosion hazard is no more than slight. Roots penetrate to the water table and flooding is a hazard because of the soils usual wetness.

***Papaa Clay, 20 to 35 percent slopes (PYE)***

Papaa soils consist of well-drained soils which formed in colluvium and residuum derived from basalt. These soils are usually used for pasture and are found in moderately sloping to very steep areas. The surface layer is very dark brown clay about 12 inches thick. The next layers, which extended down to about 24 inches, are dark reddish-brown and dark reddish-gray clay that has prismatic structure. Below this is clay to silty clay loam that has a variegated color pattern of grays, browns, and yellows. Soft, weathered rock is at a depth of about 40 inches. Papaa clay is difficult to work with because of its high shrink-swell potential. Runoff is also medium to rapid and the erosion hazard is moderate to severe. The clays in this soil are very sticky and very plastic, allowing them to crack easily when dry. The soil is slightly acidic throughout.

Based on preliminary boring information, approximately 80 percent of the new sewer segment is expected to encounter mainly lagoonal deposits consisting primarily of very soft to medium stiff silts and clays, and very loose to medium dense silty coralline sands and gravels, with some organic layers and occasional cobbles and boulders. Approximately 20 percent of the new sewer segment is expected to encounter mainly alluvial deposits consisting primarily of medium stiff to hard high plasticity clay or elastic silt with basalt sands and gravels and some basalt cobbles and boulders. A small portion of the alignment will encounter hard coral limestones.

Subsurface conditions at the southern end of the line, beginning at the intersection of Keolu Drive and Akalani Loop/Akahai Street and extending to Kaelepulu Stream, generally consist of medium stiff clayey soil interbedded with medium dense silty sands and gravel. Lagoonal deposits were found approximately 40 feet Mean Sea Level (MSL). Underlying the lagoonal



deposits are alluvium/coralline detritus extending past a depth of 105 feet (maximum depth explored).

Subsurface conditions along the remainder of the line extending to the Kailua Heights WWPS on Wanaao Road generally consisted of loose to medium dense silty sands and gravel. Localized zones of hard coral formation were also encountered near the Kailua Heights WWPS, and the northernmost end of the sewer line. Available information indicated that the coral ledge possibly begins about 470 feet from the Kawainui Canal at a depth of approximately 12 feet MSL. Lagoonal deposits reach depths of about 40 feet MSL throughout, and are underlain by alluvium/coralline detritus past 116 feet (the maximum depth explored). It is anticipated that the excavations will likely encounter hard coral formations from slightly south of the Paopua Loop to the end of the replacement line at Kailua Heights WWPS.

Ground water was encountered at boring depths from 5.5 to 12.6 feet below the existing surface.

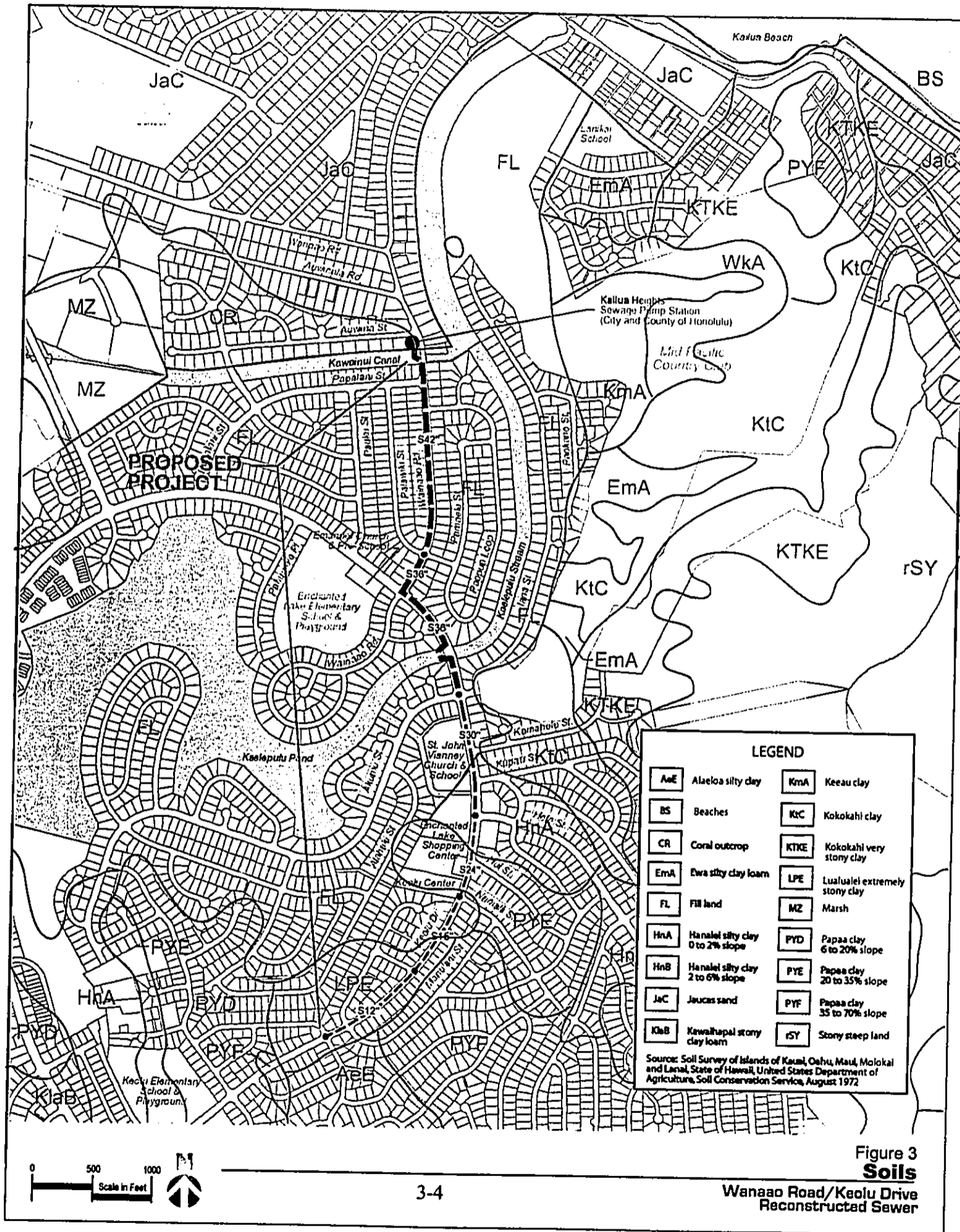
#### Potential Impacts and Mitigation Measures

Potential geotechnical concerns during construction include:

- Presence of loose or very loose subsoil. Installation of the new sewer line is expected to be difficult, as the pipe will be prone to potential differential settlements caused by the weight of new backfill materials and also to potential vibrations during sheet pile pulling, if sheet piles are used in sewer installation.
- Presence of relatively shallow ground water. Due to the proximity of the project site to Kailua Bay and the generally permeable nature of the granular soils on location, it is likely that the groundwater levels will be affected by tidal fluctuations, seasonal precipitation, and storm surge conditions.
- Presence of numerous underground utilities and underground structures. The condition of old trench backfills and their bedding material is unknown and could possibly contain cobbles, boulders, and cemented zones. This may affect the planned installations at the major utility crossings.

To provide the proper support for the sewer line, jet-grout columns would most likely need to be installed in the alluvium/coralline layer below the loose lagoonal soils, requiring an installation depth of 50 to 75 feet below the existing pavement surface. This depth will ensure that columns are embedded a minimum of 2-feet into the medium dense and/or stiff alluvial soils anticipated at 40 to 70 feet below the existing pavement surface.

It is also anticipated that the trench and shaft excavations will encounter shallow groundwater and potentially unstable soil conditions associated with lagoonal deposits. Excavations may also encounter cemented coral formations. In both cases, these excavations will likely require proper sheeting, shoring, and dewatering.



### 3.1.2 Air Quality and Odors

The Kailua area has a moderately wet climate with an annual average rainfall of about 75 inches. Most of the rain falls during the winter from November through January, with a monthly average rainfall between 7 and 9 inches, while summer months are dry with a monthly average rainfall between 3 to 5 inches. However, precipitation and cloud cover usually remain near the mountains, keeping the coastal areas relatively sunny and dry. Temperatures in the area range between a normal high of 85 degrees Fahrenheit and a minimum of 65 degrees Fahrenheit.

Prevailing winds are northeasterly trade winds, occurring approximately 70 percent of the time. Trade winds occur about 45 percent of the time in January and increase to more than 90 percent in July. Normal trade winds tend to decrease in the fall, with light, variable winds picking up through the winter and into early spring.

The nearest State Department of Health (DOH) air quality monitoring station is located at the Waimanalo Sewage Treatment Facility, approximately 4 miles east of the project site. Air quality data indicate it is likely that all national ambient air quality standards are currently being met in the project area. Vehicular traffic is the major source of air pollutants; however, the vehicular traffic levels through the area are not high enough to significantly degrade air quality levels.

#### Potential Impacts and Mitigation Measures

Climatic conditions are not expected to have a significant effect on the project. Temporary and localized negative impacts on air quality will occur in areas adjacent to the construction site. The microtunneling and HDD construction methods will help to reduce airborne particulates since the spoils come out of the ground saturated by groundwater and/or drilling fluid. Even after the separation process, fine sands will contain moisture as they are taken off-site for further handling and disposal.

Construction vehicles and machinery will generate exhaust emissions, airborne particulates, and dust. Due to the close proximity of residences and businesses along the project corridor, appropriate mitigation measures will be utilized to minimize potential air pollutants during the construction process. These mitigation measures include the following:

- Construction will be phased to minimize the amount of excavation and exposed time of open areas.
- Only clearing and excavation/trenching necessary for site access and equipment will occur.
- Stockpiles of soils and other construction spoils will not be allowed on City streets. Construction debris and excavated materials that will not be used in the future will be disposed of at permitted facilities.
- The Contractor will sprinkle water, as necessary, to control dust.

- Properly secured and welded steel plates will cover exposed travel lanes after construction hours and during weekends.
- The Contractor will use vehicles that are properly maintained.

Construction activities will employ fugitive dust emission control measures in compliance with provisions of the State DOH Rules and Regulations (Chapter 43, Section 10), and Hawaii Administrative Rules (HAR), Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33 on Fugitive Dust.

Construction of the new sewer line will not generate sewer odor. When connections to existing sewers are made, there may be brief periods when odor is emitted. Odor is generally controlled by using flow-through plugs and properly fitted manhole covers. Because the new pipeline is expected to perform satisfactorily with less frequent cleaning and maintenance—requiring direct access to the pipes—there will be fewer opportunities for the release of sewer odors.

### 3.1.3 Natural Hazards

#### *Flood Zone*

Floods are caused by heavy rainfall associated with tropical rain storms. The greatest dangers to flooding occur where mountain streams emerge onto low-lying coastal areas, monthly rainfall in the surrounding water shed exceeds 8 inches, and adequate flood control structures are lacking to channel excessive runoff. In Windward Oahu, streams originate in steep mountains and flow relatively quickly to the ocean, triggering flash floods in coastal areas. Kailua's shallow groundwater table is responsible for major flooding that tends to occur during large storm events. The Kawainui Flood Control Project (completed in 1966 to move water from Kawainui Marsh to Kailua Bay) and Kaelepulu Canal (originally built by rice farmers to control water flow from the marsh to their pond fields) have eased flooding to some extent, although urbanization and the associated creation of impervious, paved surfaces have created localized ponding problems.

The Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) indicates that most of the proposed project area is classified as Zone X, which is an area determined to be outside the 500-year flood plain (Figure 4). Approximately 120 lineal feet of sewer line crossing Kawainui Stream is classified as Zone AE, which is defined as an area that corresponds to the 100-year flood plains determined in the Flood Insurance Study by detailed methods. Mandatory flood insurance purchase requirements apply in this area. Also, approximately 200 lineal feet of transition area between the two zones is classified as Zone XS, which is an area within the 500-year flood plain.

The Tsunami Evacuation Zone Map shows that the project site is outside the tsunami hazard zone. The nearest evacuations areas are located at Kailua Elementary School, Kailua Intermediate School, and Kailua District Park—facilities that would not be impacted by project construction.

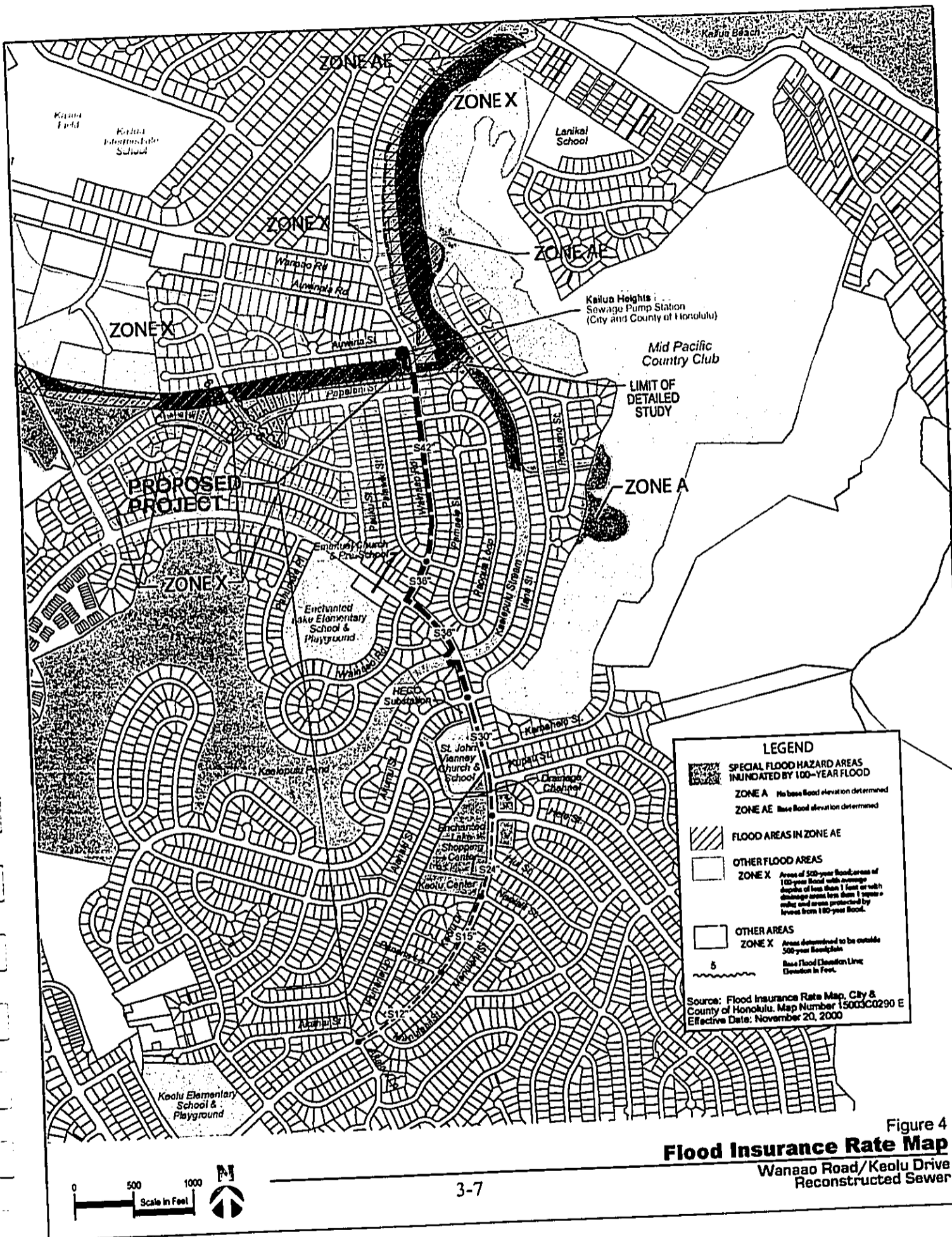


Figure 4  
**Flood Insurance Rate Map**  
 Wanaao Road/Kaolu Drive  
 Reconstructed Sewer

### ***Seismic Activity***

Oahu has experienced a number of earthquakes, but most are not strong and cause little or no damage. The Uniform Building Code (UBC) provides minimum design criteria to address potential damages due to seismic disturbances. The UBC scale is rated from Seismic Zone 1 through 4, with 1 being the lowest level for potential seismic induced ground movement. The island of Oahu is in UBC Earthquake Zone 2A, with a design horizontal acceleration of 0.15g. This acceleration is intended to correspond to a probability of being exceeded 10 percent or less over a time interval of 50 years.

A preliminary assessment of liquefaction potential was performed at selected boring locations along the proposed sewer alignment. The results indicated that the very loose to loose sands (mainly lagoonal deposits) encountered along the sewer pipeline alignment have a moderate to high potential for liquefaction under ground shaking conditions similar to an earthquake of Richter magnitude 5.25 or greater, or induced by construction equipment such as vibratory hammers.

### **Potential Impacts and Mitigation Measures**

Flooding is possible near the drainage channels. Contract documents will require the Contractor to monitor weather conditions and prepare the work site to prevent flood damage, prevent sewage overflows, and maintain continuous wastewater service. The Contractor will be required to provide sewage bypass pumps sized for peak wet-weather sewage flows and back-up bypass pumps.

The new sewer line will be designed to meet or exceed UBC design criteria for Earthquake Zone 2A. Although earthquakes are the most notable cause of liquefaction, the phenomenon can also be induced by some types of construction equipment, such as vibratory hammers. The potential for liquefaction and possible damage to nearby walls, fences, and structures, can be reduced by limiting or prohibiting the use of equipment with strong vibrations.

### 3.1.4 Hydrology and Water Quality

#### Surface Water

The proposed alignment crosses two perennial streams, Kaelepulu Stream and Kawainui Canal, and an unnamed drainage channel. The Hawaii Stream Assessment (Hawaii Commission on Water Resource Management, 1990) evaluated the quality of various stream resources. The two perennial streams received the following ratings:

	Kaelepulu Stream	Kawainui Canal
Aquatic Resources (ability to support aquatic fauna, most of which have a life cycle involving both the stream and the sea; rankings based on the presence of four native species considered to be indicators of a healthy native aquatic ecosystem).	Without	Outstanding
Riparian Resources (related to geologic features of the stream itself and overall ecological conditions and that may affect stream quality and management).	Substantial	Outstanding
Cultural Resources (including archaeological resources, historic sites, and current taro cultivation).	Taro cultivation	Est. 10 historic sites; high sensitivity
Recreational Resources (including boating, fishing, nature study areas, parks, scenic views, and swimming).	Fishing Swimming Boating Park	Fishing Boating Park

#### Water Quality of Streams

The Final EIS for the Kailua-Kaneohe-Kahaluu Facilities Plan (2000) contained data from bacteriological sampling of streams in Kailua including Kaelepulu Stream and Kawainui Canal. The data themselves were drawn from two studies conducted by the University of Hawaii, Water Resources Research Center in October 1993. One study looked at impacts of discharges of freshwater from Kawainui Canal into Kailua Bay and to determine the sources of water quality indicator bacteria. The other study was intended to determine the impact of Kaelepulu Stream on the microbiological quality of the waters in Kailua Bay and to determine the possible sources of indicator bacteria. Data obtained at that time indicated an exceedance of established recreational water quality standards. It was determined that high levels of *Clostridium perfringens* (an indicator of fecal wastes) were not a product of sewage discharge, but most likely due to feces

from ducks that concentrate in the area. Bacteria levels were highest in areas where water enters the drainage systems. Most sampling sites also exceeded State standards for levels of *E. coli* and fecal coliform, especially at sites below urban development. The source of most fecal bacteria was previously determined to come from the soil.



Kaelepulu Stream



# DOCUMENT CAPTURED AS RECEIVED



Kawainui Canal

## **Groundwater**

The project area overlies the Koolaupoko Aquifer System which extends from Waikane Valley to the Nuuanu Pali. Given the low elevation of the project area, the aquifer types found in the system is basal aquifers. Basal groundwater occurs at shallow depths and floats on the heavier seawater. Some of the groundwater in the system eventually drains to streams or emerges in wetlands. Groundwater also leaves by unseen underflow to the ocean and through caprock. Where the water table is at or higher than the streams, groundwater inflow contributes to stream flow. The opposite may be true if the water table is below the stream level, particularly if the stream is perched on highly permeable alluvium.

Groundwater was encountered in all of the borings drilled for this project. Relatively shallow groundwater was encountered at depths ranging between 5.5 and 12.6 feet below the existing pavement surface (Geolabs, 2002).

#### Potential Impacts and Mitigation Measures

Horizontal directional drilling (HDD) was selected as the preferred construction method for the Kaelepulu Stream crossing to install the siphon sewer and to minimize disruptions to the stream environment. With HDD, the curved drill path would be bored 20 to 40 feet beneath the streambed. Therefore, construction activities would not impact or alter the waterway or aquatic habitat.

Microtunneling is the preferred construction method for the crossing under Kawainui Canal. A major constraint at this location is connection to the wet well at the Kailua Heights wastewater pump station, which has a depth of approximately 20 feet. Tunneling at this depth, would allow limited ground cover between the pipe and the bottom of the canal. To increase the cover, the sewer line was redesigned from one 42-inch pipe to two 30-inch pipes. To provide protection against potential damage to the new sewer crossing at shallow depth beneath the canal, a slightly larger diameter steel casing has been proposed for this section. A stainless steel or other approved casing pipe will be jacked first, then the sewer installed inside the casing. However, there remains a slight possibility that the boring might collapse and/or cuttings might seep out of the boring. As a precaution against such an event and to mitigate the dispersal of spoils and drilling fluid (mud), a silt curtain could be erected along the canal crossing alignment.

Another option is to use conventional surface methods to lay the pipeline. If this option is selected, there is a potential for adverse impacts from construction activity occurring in the stream channel. Burial of the sewer line beneath Kawainui Canal will require additional measures to minimize impacts on stream flow and stream biota. The stream would be temporarily diverted to one side of the channel through the use of sheet piles and/or steel plate coffer dams. After the first half of the segment is completed, the stream would be diverted to the other side to complete the installation.

Water pumps would be used to discharge water from the construction area into settling tanks. The dewatering discharge would go through a dewatering treatment and filtration system to remove silt, dirt, oil, grease, and suspended solids to acceptable levels. Best Management Practices and a water quality monitoring plan would be developed for the stream crossing work. A water quality monitoring plan would be established to verify the adequacy of the dewatering filtration system and to ensure that the proposed construction activities will not result in long-term adverse impacts to State waters. Water sampling would be performed before construction commences to define the water quality baseline, during construction activities, and after construction is completed. The water quality parameters to be measured include total suspended solids, dissolved oxygen, temperature, pH, turbidity, salinity, and oil and grease. This effort would be coordinated with the State Department of Health's (DOH) Total Maximum Daily Load (TMDL) program for Kailua Bay.

Construction activity in the water would also require additional permits:

- A Department of the Army, Section 404 permit will “likely be required” for the stream, as indicated by the Chief of the Regulatory Branch, George Young
- Section 401 Water Quality Certification, State Department of Health

**Runoff Contaminants.** The proposed project will not increase the volume of peak stormwater runoff or contribute contaminants to stormwater runoff. Materials that may enter streams and drainage channels include soil from excavations, particles from paving materials, oil and grease from construction equipment, and suspended particles in dewatering effluent. Adverse impacts to surface water quality will be mitigated through erosion control measures, treating dewatering effluent to remove silt, and use of silt fences and sediment-trapping drain inlet filters. Construction will be phased and scheduled to limit the time that bare ground is exposed to minimize erosion. Pavement and groundcover will be restored as soon as is practical.

The Contractor will be required to treat dewatering effluent using appropriate Best Management Practices, such as sedimentation, chemical pretreatment, and/or filtration prior to discharge. Dewatering effluent contaminated with sewage will be discharged to the sewer system. Accidental sewage spills during construction will be reported in accordance with standard DOH protocol. The Contractor will be required to submit a spill mitigation plan before work begins.

The National Pollutant Discharge Elimination System (NPDES) general permit will be obtained from the DOH Clean Water Branch for:

- Construction activities
- Construction effluent disposal
- Hydrotesting water disposal

Water quality testing will be performed to comply with the requirements of the NPDES permit.

### 3.1.5 Noise Quality

Noise is regulated by DOH under HAR Chapter 11-42, “Vehicular Noise Control for Oahu,” and Chapter 46, “Community Noise Control.” The following are current allowable noise limits for residential, apartment, and community business properties on Oahu.

Zoning	Daytime (7:00 am – 10:00 pm)	Nighttime (10:00 pm – 7:00 am)
Residential	55 dBA	45 dBA
Apartment	60 dBA	50 dBA
Community Business	60 dBA	50 dBA

### Potential Impacts and Mitigation Measures

**Project Construction Noise.** Noise levels will increase for the duration of the construction period because of construction equipment and the movement of construction vehicles. Project construction will likely involve excavation, pre-drilling, sheet pile driving, ground improvement (grouting), backfilling, power generation, and paving. The various construction activities are expected to have an adverse impact on nearby residential areas and other sensitive receptors, such as schools and churches. The actual noise levels produced will be a function of the methods employed during each stage of the construction process.

Pile drives and earthmoving equipment, such as backhoes, front loaders, bulldozers, and diesel-powered trucks, will be among the loudest equipment used during construction. Sheet pile driving may be one method for shaft construction available to the Contractor. Noise levels are anticipated to be in the range of 100-105 dBA within 50 feet of the driving operation. Some of the noise can be mitigated by requiring the use of a noise damping blanket. Microtunneling activities will produce noise in the range of 70-90 dBA, mostly from cranes, generators, the slurry plant, and other engines. During jet grouting, the vacuum truck produces noise in the range of 80-100 dBA. Several measures will be implemented to reduce noise levels, including pre-drilling to reduce vibrations and resistance to driving, and requiring the Contractor to use quieter equipment (e.g., generators) when available, mufflers and noise reduction blankets (e.g., around pile drivers), and noise barriers, which can reduce noise levels by about 10 dBA.

Work on weekends and at night will be limited. However, in some cases, it may be necessary to operate equipment overnight, such as sewage pumps to bypass flow around the work area or pumps to dewater trenches in cases of emergency repair. Although the pumps would be housed in noise-attenuating enclosures, noise standards may be exceeded. On occasion, emergency microtunneling may be needed where there is a risk that machinery could get stuck if operations are stopped at the end of a normal work day or to complete a HDD pullback operation.

In cases where construction noise exceeds, or is expected to exceed the DOH's "maximum permissible" property line noise levels, a permit must be obtained from the DOH to operate vehicles, construction equipment, and power tools. Required permit conditions for construction activities are:

- No permit shall allow construction activities creating excessive noise before 7:00 am and after 6:00 pm of the same day
- No permit shall allow construction activities which emit noise in excess of 95 dBA except between 9:00 am and 5:30 pm of the same day
- No permit shall allow construction activities which exceed the allowable noise levels on Sundays and on certain holidays. Pile driving and other activities exceeding 95 dBA will be prohibited on Saturdays.

Within the overall project schedule, the Contractor will be required to coordinate noisier construction activities with area schools and their vacation periods. The Contractor will also be

required to notify individual homes, businesses, and schools prior to the start of construction. All affected parties will have access to the construction manager through a 24-hour hotline.

**Project Generated Traffic Noise.** During some portions of the project, vehicles may be detoured onto side streets. Detoured vehicles will increase the traffic volume and, therefore, traffic noise on these streets. It is expected that detours will be operation only during construction hours. Detour locations, times, and durations, have not been determined. After the project is completed, noise levels are expected to return to pre-construction levels.

### 3.1.6 Hazardous Materials

Construction of the proposed pipeline is not expected to encounter high concentrations of hazardous materials. The land was used primarily for agriculture or undeveloped prior to residential and commercial development. The commercial district currently has two active service stations and one former service station. These properties contain or previously contained underground storage tanks for fuel.

#### Potential Impacts and Mitigation Measures

During construction, the Contractor will be required to perform hazardous materials testing on excavated soil and spoils taken offsite for disposal. The Contractor and construction inspectors will visually monitor excavations and groundwater for signs of possible contamination, such as oil sheens or unusual odors. If soil contamination is suspected, soils and groundwater will be tested immediately to determine if hazardous materials are present. Appropriate remedial action will be taken to meet applicable regulatory requirements. Design and/or construction methods will be modified, as needed.

## 3.2 BIOLOGICAL ENVIRONMENT

### 3.2.1 Flora

The proposed alignment is entirely along paved streets in the suburban residential community of Kailua. The project area lies within Ripperton and Hosaka (1942) vegetation zone B. Zone B typically consists of coastal flats and adjacent sloping lands with rainfall less than 20 inches to 40 inches. Ground cover on undeveloped lands is typically sparse and conditions are semi-desert. Kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*) and klu (*Acacia farnesiana*) are common. Ilima (*Sida fallax*) and uhaloa (*Waltheria indica*) are common shrubs. Both perennial and annual grasses occur in natural situations. However, the predominant vegetation regime today consists of well-manicured residential lots with a host of introduced and native ornamental shrubs and trees that would not be adapted to the area if they were not watered and otherwise maintained.

Red mangrove (*Rhizophora mangle*) line Kawainui Canal and Kaelepulu Stream. Both channels can be navigated by small recreational boats. Depth is greater than 2 feet at mid channel. The concrete lined drainage channel north of Enchanted Lake Shopping Center contains a very low flow of water of about 1 inch in depth during dry periods.

There are no rare, endangered, or threatened species of plants in the project corridor.

Potential Impacts and Mitigation Measures

This project is not anticipated to have an adverse impact on flora. Landscaping on public and/or private property may be displaced by construction activities; however, the Contractor will be required to restore plant materials in accordance with pre-construction conditions.

**3.2.2 Fauna**

The U.S. Fish and Wildlife Service has identified four federally listed waterbird species that may occur in the project area (letter dated July 2, 2001).

Common Name	Hawaiian Name	Scientific Name	Federal Status
Hawaiian duck	Koloa maoli	Anas wyvilliana	Endangered
Hawaiian coot	Alae ke'oke'o	Fulica alai	Endangered
Hawaiian moorhen	'Alae 'ula	Gallinula chloropus sandvicensis	Endangered
Hawaiian stilt	Ae'o	Himantopus mexicanus knudseni	Endangered

The Hawaiian owl or pueo (*Asio flammeus*), a species of concern, was also mentioned.

A field survey was conducted by certified wildlife biologist Tim J. Ohashi for this project on July 13, 2002 between 8:20 a.m. and 09:20 a.m. Five count stations were established along the proposed route to sample both terrestrial wildlife and assess the presence of wildlife within drainage canals and ditches. Observations were made for three minutes at each station. All birds seen and heard were recorded. In addition to the counts at the stations, searches for wildlife signs and incidental observations were made along the entire route.

- Station 004 Wanao Bridge over Kawainui Canal on Wanao Road next to wastewater facility
- Station 005 Intersection of Keolu Drive and Wanao Road
- Station 006 Keolu Bridge over Kaelepulu Pond Drainage Canal on Keolu Drive
- Station 007 Drainage ditch north of Enchanted Lakes Shopping Center on Keolu Drive
- Station 008 Intersection of Keolu Drive and Nanialii Street

### Avian Findings

Fifteen species of birds were identified from the station counts. They are listed in order of abundance (count totals in parentheses, I = introduced, N = native, E = endangered):

Pigeons (*Columba livia*) (40) I  
Spotted dove (*Streptopelia chinensis*) (15) I  
Common myna (*Acridotheres tristis*) (13) I  
Red avadavat (*Amandava amandava*) (12) I  
Red vented bulbul (*Pycnonotus cafer*) (11) I  
Zebra dove (*Geopelia striata*) (9) I  
English sparrow (*Passer domesticus*) (7) I  
Java sparrow (*Padda oryzivora*) (2) I  
Hawaiian Duck (*Anas wyvilliana*) (2) E  
Japanese White-eye (*Zosterops japonicus*) (2) I  
Red crested cardinal (*Paroaria coronata*) (2) I  
House finch (*Carpodacus mexicanus*) (2) I  
Mallard (*Anas platyrhynchos*) (2) I  
Muscovy ducks (*Cairina moschata*) (2) I  
Hawaiian Stilt (*Himantopus mexicanus*) (1) E

Pigeons were the most numerous bird encountered. The majority of them were found at Station 004 where they were being kept at a residence. All other introduced species are typical of urbanized lowland areas on Oahu. A pair of mallards and two muscovy ducks (*Cairina moschata*) were found within the drainage ditch next to Enchanted Lake Shopping Center (see photo).

The Hawaiian stilt is a federally listed endangered species. One was observed flying overhead at Station 004. It was flying from the direction of Kaelepulu Pond that provides stilt habitat. There was, however, no shallow water stilt habitat, along the proposed route, at either of the crossings over the larger drainage canals. The concrete lined drainage ditch next to the shopping center could provide foraging habitat for stilts, but no stilts were observed during the survey.

The Hawaiian duck is a federally listed endangered species. A pair was encountered at Station 006 within the Kaelepulu Pond drainage channel where they foraged along the shoreline at the base of the bridge foundation (see photo).

No Hawaiian coot (*Fulica alai*) or Hawaiian moorhen (*Gallinula chloropus sandvicensis*) were observed along the proposed route. Both species are federally listed endangered waterbirds that occur in Kaelepulu Pond and nearby marshes.

No native short-eared owl or pueo (*Asio flammeus sandwichensis*) was seen during the survey. Nearby hillsides may provide owl habitat but the proposed project does not effect these slopes.

### ***Mammalian Findings***

Trapping is usually required to adequately survey an area for small mammals. No trapping was conducting for the survey but the following mammals could be expected for the area:

Small Indian mongoose (*Herpestes auropunctatus*)  
Feral cat (*Felis cattus*)  
Rats (*Rattus* sp.)  
House mouse (*Mus musculus*)

The Hawaiian hoary bat (*Lasiurus cinereus semotus*) is the only native terrestrial mammal found in Hawaii. It is a federally listed endangered species. Bats are not frequently encountered on the island of Oahu, therefore, the survey was not designed to detect bats which are more commonly observed at dusk, but sometimes in the early morning. No bats were observed.

### **Potential Impacts and Mitigation Measures**

The proposed project route crosses two major drainage channels, Kawainui Canal and Kaelepulu Stream, and one concrete lined drainage ditch that provide some waterbird habitat. The route is entirely along roads and bridges within a highly disturbed area of suburban residential and commercial properties. The fauna in the project area would most likely include naturalized introduced species that have adapted readily to the human environment.

The Hawaiian duck, a federally listed endangered species, was seen within Kaelepulu Pond Drainage channel. A Hawaiian stilt, also a federally listed endangered species was seen flying over the proposed route. Care must be taken during the construction project to minimize disturbance of any endangered species that may approach the construction site.

The waterbird habitat along the route is marginal and the presence of waterbirds along the route shows how adaptable the birds can be to human activities. The proposed project is not expected to result in significant adverse impact on endangered species.



# DOCUMENT CAPTURED AS RECEIVED

---



Endangered Hawaiian ducks, Kaelepulu Stream



Unnamed drainage channel north of Enchanted Lake Shopping Center, from Keolu Drive

### 3.3 SOCIO-ECONOMIC ENVIRONMENT

#### 3.3.1 Population and Employment

According to the U.S. Census Bureau's geography, the project is located in the Kailua Census Designated Place (CDP). In 1990, the Kailua CDP had a residential population of 36,818. In 2000, the population fell slightly to 36,513 (see Table 3). Data from the 2000 Census also showed the majority of the population between the ages of 35 and 54, an indication of a maturing community.

Table 3: Population of Kailua, Oahu, and Hawaii, 1990 and 2000

	1990	2000	Net Change	Percent Change
Kailua CDP	36,818	36,513	-305	-0.8
Oahu	836,231	876,156	39,925	4.8
Hawaii	1,108,229	1,211,537	103,308	9.3

Source: U.S. Census Bureau, Summary File Tape 1, 1990, 2000

#### *Economy*

The project area includes a compact, but important commercial district for the Enchanted Lake community. Businesses are located in a three-block area of Keolu Drive between Nanialii Street and Iana Street. Commercial establishments include a broad range of enterprises ranging from fast food drive-ins to small, sit-down restaurants, gas stations, supermarket, mini marts, craft store, banks, and dentist and physician offices. The main clientele appears to be residents in the Enchanted Lake subdivision, with a secondary market area extending to the Windward region.

#### Potential Impacts and Mitigation Measures

The proposed project will not affect population levels. Although the project will increase the capacity of sewer pipes, this design feature is intended to remedy pipes that are currently too small to handle peak flows.

Construction of the proposed sewer line, estimated to cost \$29.5 million, will be funded by the City and County of Honolulu's CIP Program.

The project will provide employment for contractor personnel, material suppliers, and others involved with the construction industry. The increase in employment will be temporary. Because Oahu has a single labor market, construction crews are likely to come from dispersed places beyond the project area.

Traffic impacts during construction may temporarily reduce the number of customers at the Enchanted Lake Shopping Center and other nearby businesses. Potential mitigation measures are addressed in Section 3.4.

### 3.3.2 Surrounding Land Uses

Commercial businesses consisting of low-rise buildings are located along both sides of Keolu Drive from Nanialii to Hui Street. St. John's Vianney School and Church is located near the intersection of Keolu Drive and Kamahale Street. Land use along the remainder of the alignment along Keolu Drive and Wanaao Road is predominantly residential, consisting of one- and two-story homes. Roadways in the project area are covered with asphalt concrete (AC), and include AC or concrete driveways. Privately owned concrete rock masonry and tile walls, and wooden and metal chain link fences are located within close proximity along the majority of the property lines of the alignment. These walls are not expected to be supported by foundations, and are prone to damage and cracking during construction. Overhead utilities that run along Keolu Drive and Wanaao Road include telephone, street light, and electrical lines. These overhead utilities will affect construction access and must be considered in design and construction.

#### Potential Impacts and Mitigation Measures

Three easement areas are required to allow ingress and egress for installation of sewer siphon lines under Kaelepulu Stream and for any future maintenance, repair, or replacement work to these lines. The properties affected are:

- TMK 4-2-050: 076 (1,081 SF)
- TMK 4-2-050: 075 (138 SF)
- TMK 4-2-049: 010 (1,472 SF)

Standard City and County protocols will be followed to acquire the sewer easements. Property owners are compensated.

Motorists who frequently travel on Keolu Drive and Wanaao Road will face inconveniences during construction. Disruptions will be temporary and will last only as long as it takes to install each segment. A traffic control plan will be prepared to mitigate project impacts to surrounding land uses and owners.

### 3.3.3 Scenic and Visual Resources

The most significant visual resources in the project area are the views of the Koolau Mountain Range and Mount Olomana. These visual resources can be seen from various points along Keolu Drive and Wanaao Road.

### Potential Impacts and Mitigation Measures

Installation of the underground pipe line will have no adverse impacts on existing views, view planes, or aesthetic resources. As the installation does not include any aboveground structures, any impact during construction will be temporary.

During the pre-assessment consultation process, a letter was received from residents in the project area expressing concern about parked equipment creating an eyesore. To minimize the project's visual impact, contract documents will prohibit the Contractor from storing materials and/or equipment along the alignment, except within the prescribed limits of 24-hour staging areas. The staging areas will be used during set-up and mobilization, period of actual construction, and break-down. Spoils will be removed daily; no on-site stockpiling of spoils will be permitted. Except for equipment and materials being used at the work site, the Contractor will be required to procure a baseyard away from residential and business areas. The Contractor will also be monitored so that work and staging areas are kept clean and free of debris, dust, and mud.

#### **3.3.4 Archaeological, Historic, and Cultural Resources**

A Traditional and Cultural Assessment Study was conducted for this project by Cultural Surveys Hawaii in July 2002. The study consisted of a field inspection along the edges of Wanaao Road and Keolu Drive and archival research of documents and maps.

##### ***Summary of Cultural Practices in the Immediate Vicinity of the Project Area***

Early maps of the project area and Mahele records indicate that Kaelepulu was well-populated but the focus of habitation and wetland taro production appears to have been on the southwest margin (Pooakea). This probably reflects the greater availability of fresh running water in the area. No kuleana (commoner) land claims were made in the immediate vicinity of the project area. This may reflect an absence of fresh, running water and more brackish conditions less amenable for drinking and taro production. The potential for a number of different cultural impacts is evaluated below.

**Wahi Pana (Storied Places).** The traditional cultural import of the project area would appear to adhere to Kaelepulu Pond and to a lesser extent to Kawainui. The proposed alignment lies on the margins of Kaelepulu Pond and crosses its main drainage channel, Kaelepulu Stream. In the case of Kawainui, the project alignment crosses its southern drainage channel, Kawainui Canal. These were both wahi pana or "storied places" rich in Hawaiian traditions.

Kaelepulu Pond has been designated State Site 50-80-11-377 largely because of its cultural associations rather than specific archaeological findings. These cultural associations include its use as a fishpond, association with a moo (water spirit demi-god) and association with the celebrated foot-runner Ulanui and the goddess Hiiaka and her companion Wahine-omao.

Kawainui Marsh (State Site 50-80-11-2029, declared eligible for the National Register of Historic Places) is referred to in the legends of Kawelo, Kahalaopuna, Keomelemele, the menehune, and in the history of the ruling chiefs Kualii and Olopana. Kawainui was the home of the moo Hauwahine and of the wish-fulfilling tree Makalei.

The proposed sewer line would have no adverse impact on either of these two wahi pana in their presently developed condition.

**Hawaiian Archaeological Sites.** Other than Kaelepulu Pond itself (designated primarily for cultural associations), no archaeological sites have been designated in the vicinity.

**Burials.** There have been over fifteen reports of human skeletal remains from coastal Kailua. However, no burials have ever been reported from the Kaelepulu or Keolu areas or within 500 meters of the project area.

**Sacred Sites.** Kaelepulu was a sacred site in the sense that it was home to a guardian moo. The primary importance to the ancient Hawaiians was as a place of residence and wetland agriculture. No other sacred sites are known in the vicinity.

**Trails.** Numerous trails are indicated in the vicinity of the project area on historic maps. This transportation system has long been subsumed by the road system of the Enchanted Lake subdivision. The proposed project will have negligible impacts on pedestrian access. Safe walkways around construction areas will be designated for pedestrians.

**Gathering Practices.** Vegetation in the area is all street and subdivision plantings and landscaping. Exotic mangroves have invaded the margins of the dredged channels. No native gathering practices are believed to be operative.

**Fishing.** Kawainui and Kaelepulu were famous for their mullet, awa, ahole, and oopu fish and for their limu kala-wai. The traditions also emphasize, however, that access to the resources of the fishpond were regulated by the konohiki. Fishponds were typically as proprietary as taro patches. It seems probable that in the late 19<sup>th</sup> century these kapu broke down with freer access for the common people. Today some or all fishing access appears to be regulated by law, presumably for reasons of safety. It is unlikely that the project will have more than a transient restriction of fishing practice.

#### Potential Impacts and Mitigation Measures

Based on background research, the fill soil in the area, and the urbanization of this area, it is unlikely that any traditional Hawaiian activities will be encountered within the proposed sewer line project area, other than fishing. Impacts to fishing would be of short duration when work is actually in progress at the two bridges.

The State Historic Preservation Division (SHPD), commented by letters dated May 30, 2000 and November 29, 2000 that deposits of beach sands classified as Jaucus sand are known to contain human burials and other cultural artifacts. As shown in Figure 3, Jaucus sand is found north of Kawainui Canal. The proposed pipeline ends at the pump station which abuts the north side of the canal. The area south of the canal, where the pipeline will be constructed, is fill land with coral outcrops and unlikely to contain historic sites.

However, to mitigate against adverse impacts, an archaeological monitoring plan will be prepared and submitted to the SHPD for review and approval. Additionally, protocols for construction will require that, if significant cultural deposits or human skeletal remains are encountered, work in the immediate vicinity will stop and the SHPD will be contacted.

### 3.4 TRAFFIC AND CIRCULATION

#### *Existing Roadway System*

The proposed project will be constructed within the following rights-of-way:

- Keolu Drive between Akalani Loop/Akahai Street and Wanaao Road
- Wanaao Road between Keolu Drive and Auwina Street

All streets have a posted speed limit of 25 miles per hour and are owned by the City and County of Honolulu.

Keolu Drive is a four-lane, looped collector road with turn lanes. It connects to the regional transportation system at Kalaniana'ole Highway and provides circulation through the Enchanted Lake subdivision. Roadway improvements include curbs, gutters, sidewalks, and a planting strip between the curb and sidewalk. On-street parking is allowed in the residential areas and in some parts of the commercial district. The posted speed limit is 25 miles per hour.

Three intersections within the project area are signalized:

- Keolu Drive at Hele Street
- Keolu Drive at Akumu Street
- Keolu Drive at Wanaao Road

Wanaao Road is a two-lane residential street off of Keolu Drive. It is improved with rolled curbs, planting strip, and sidewalks. Street parking is allowed on both sides. Because it provides one of two connections to Kailua Town—Hamakua Drive being the other—Wanaao Road experiences average daily use that is heavier than typical traffic volumes on local streets.

There is a posted speed limit of 25 miles per hour. Resident complaints about high-speed traffic led to a pilot project with traffic calming measures, including two midblock traffic islands and medians at the intersection of Wanaao Road and Auwina Street. The experiment was

discontinued in July 2005 because of difficulties getting in and out of driveways, bottlenecks caused by buses blocking the narrowed lanes, and loss of on-street parking spaces.

#### ***Traffic Conditions***

Tables 4 and 5 show estimated traffic volumes at a key juncture—Keolu Drive and Wanaao Road—based on counts taken over a 24-hour period from Wednesday, February 16, 2005 to Thursday, February 17, 2005. The 24-hour traffic count on Keolu Drive totaled 12,515, with 8,463 vehicles traveling northwest bound (toward Hamakua Drive) and 4,052 vehicles traveling southeast bound (toward Enchanted Lake Shopping Center). A total of 6,094 vehicles traveled on Wanaao Road over the 24-hour period, with 5,702 vehicles traveling southwest bound (toward Kaelepulu Pond) and 392 vehicles traveling northeast bound (toward Kailua Beach).

Figures 5 through 8 show the hourly distribution of vehicles. All four charts reveal a brief, but relatively intense morning peak period between 7:00 and 8:00 am. Traffic after 8:00 am subsides noticeably. The afternoon peak period is more protracted, with elevated traffic volumes from 4:00 to 7:00 pm.

#### ***Public Transportation***

The proposed alignment coincides with Bus Route 57 and 85/85A. Route 57 runs between Kailua and Downtown Honolulu and Ala Moana Shopping Center. During the daytime, the bus arrives at 30-minute intervals. The westbound portion travels along Keolu Drive. As the route only travels the Keolu Drive loop, construction on Wanaao Road will not directly affect the bus route. Although the 85/85A bus route does not have any stops within the proposed project area, it passes on both Keolu Drive and Wanaao Road. The 85/85A runs between Kailua and Downtown Honolulu, but only passes through the project area during the hours of 5:55 a.m. to 6:37 a.m., which is before the normal construction work day.

#### ***Bikeways***

There is a marked bike lane on Keolu Drive that begins just outside the project area, on the north side of the Wanaao Road intersection. There are no marked bike lanes in the project area itself; however, bicyclists are frequently seen riding on the sidewalks or sharing the road with motorists.

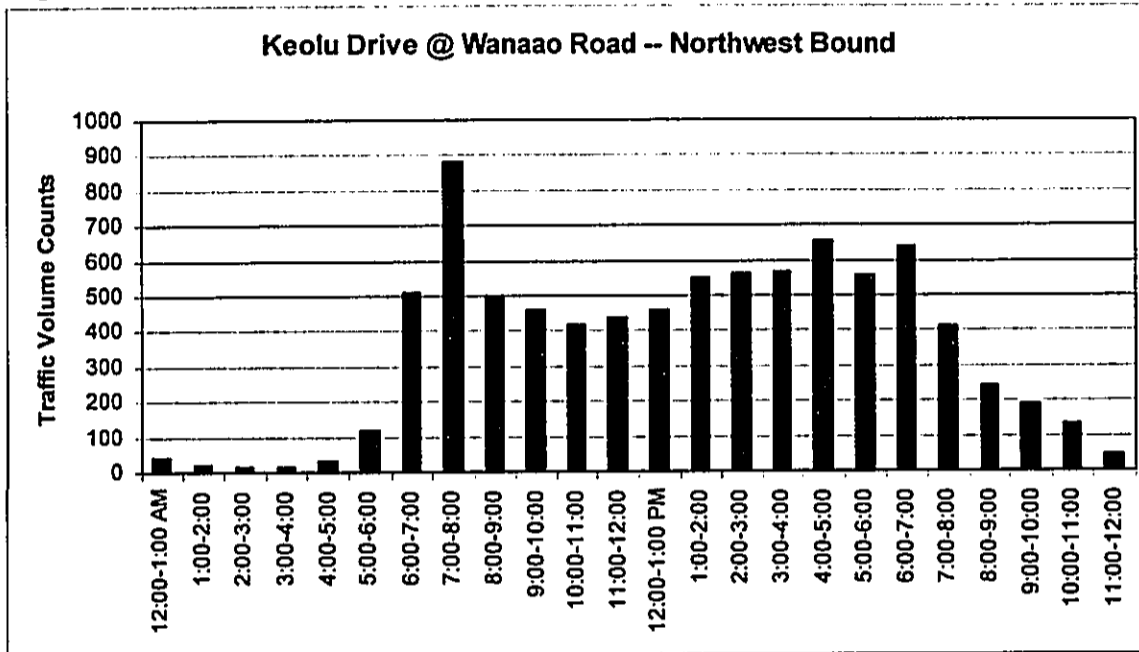
**Table 4: Traffic Volume Counts, Keolu Drive at Wanaao Road**

A.M.	NW Bound	SE Bound	P.M.	NW Bound	SE Bound
12:00-1:00	42	20	12:00-1:00	459	222
1:00-2:00	19	12	1:00-2:00	551	308
2:00-3:00	15	9	2:00-3:00	560	315
3:00-4:00	14	5	3:00-4:00	569	264
4:00-5:00	31	10	4:00-5:00	655	368
5:00-6:00	119	34	5:00-6:00	555	344
6:00-7:00	509	71	6:00-7:00	638	312
7:00-8:00	884	275	7:00-8:00	411	284
8:00-9:00	501	189	8:00-9:00	241	212
9:00-10:00	461	175	9:00-10:00	193	112
10:00-11:00	420	222	10:00-11:00	133	55
11:00-12:00	439	203	11:00-12:00	44	31
12-Hour A.M.	3,454	1,225	12 Hour P.M.	5,009	2,827
24-Hour Total	8,463	4,052			

Source: City and County of Honolulu, Department of Transportation Services,  
Wednesday, February 16, 2005 to Thursday, February 17, 2005

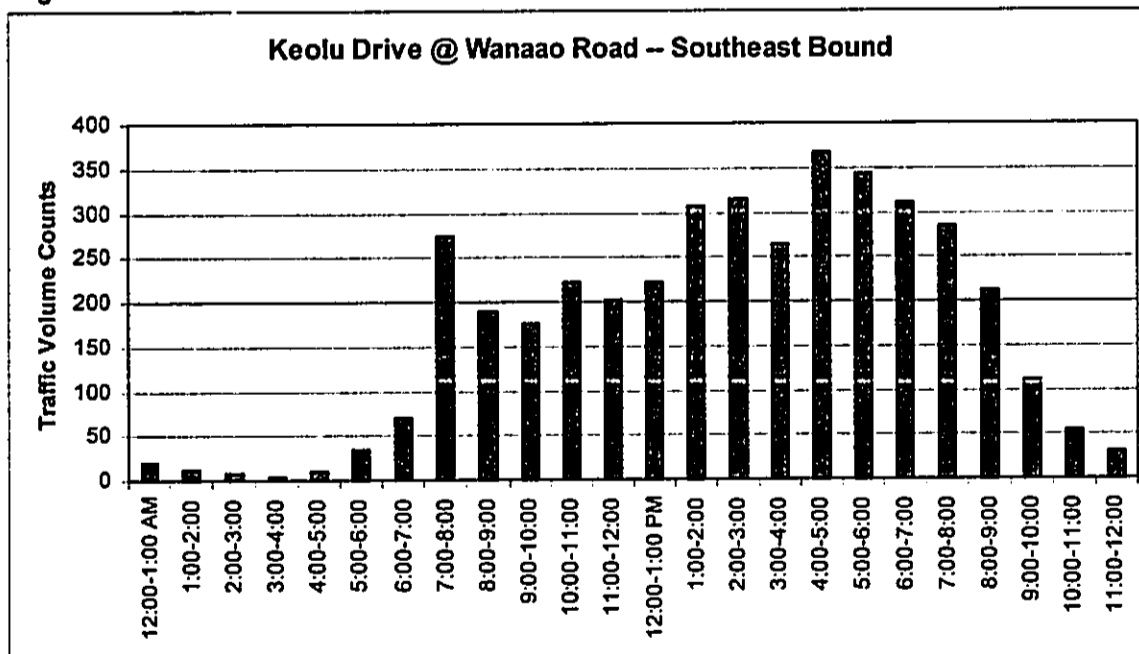


Figure 5



Source: City and County of Honolulu, Department of Transportation Services, Wednesday, February 16, 2005 to Thursday, February 17, 2005

Figure 6



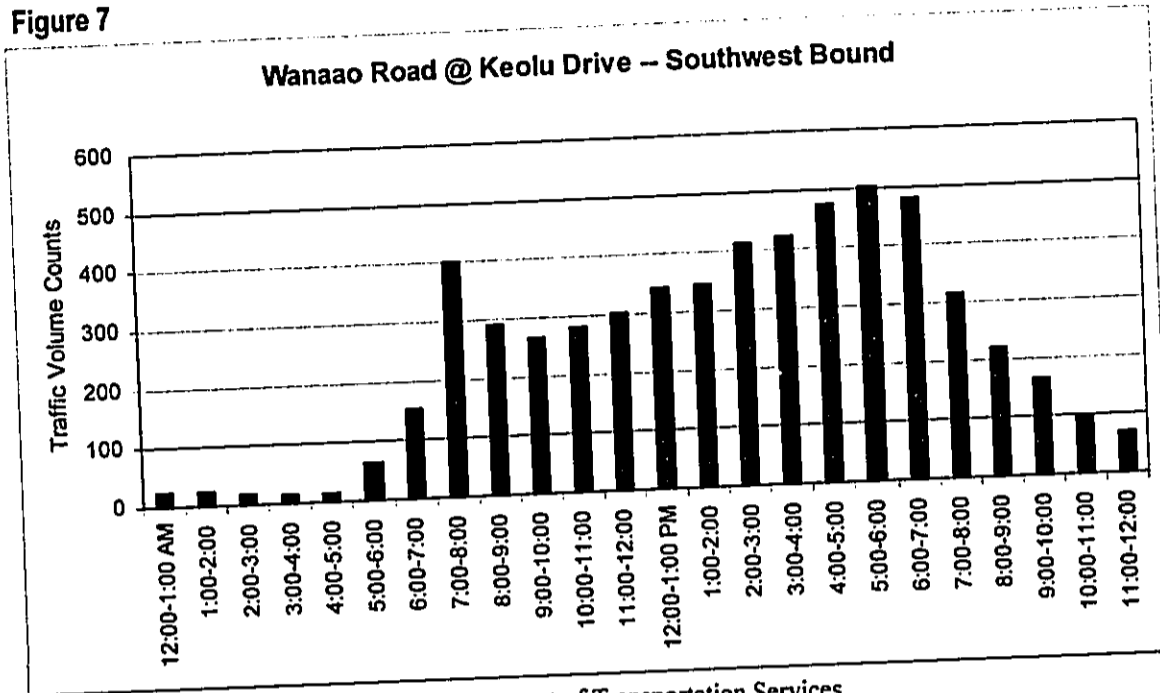
Source: City and County of Honolulu, Department of Transportation Services, Wednesday, February 16, 2005 to Thursday, February 17, 2005

**Table 5: Traffic Volume Counts, Wanaao Road at Keolu Drive**

A.M.	NE Bound	SW Bound	P.M.	NE Bound	SW Bound
12:00-1:00	1	24	12:00-1:00	23	343
1:00-2:00	0	25	1:00-2:00	22	345
2:00-3:00	0	17	2:00-3:00	17	413
3:00-4:00	2	16	3:00-4:00	18	421
4:00-5:00	3	15	4:00-5:00	23	473
5:00-6:00	12	63	5:00-6:00	29	501
6:00-7:00	28	153	6:00-7:00	32	480
7:00-8:00	56	401	7:00-8:00	22	316
8:00-9:00	34	292	8:00-9:00	11	220
9:00-10:00	8	265	9:00-10:00	20	165
10:00-11:00	10	282	10:00-11:00	12	98
11:00-12:00	8	304	11:00-12:00	1	70
12-Hour A.M.	162	1,857	12 Hour P.M.	230	3,845
24-Hour Total	392	5,702			

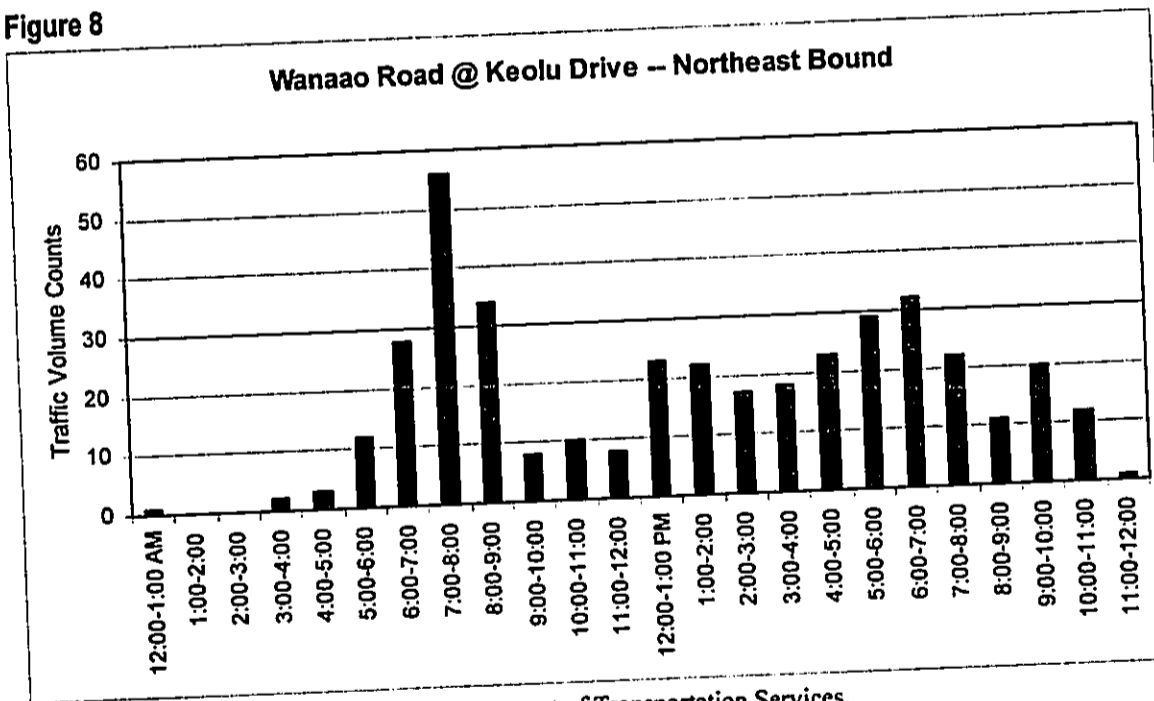
Source: City and County of Honolulu, Department of Transportation Services,  
Wednesday, February 16, 2005 to Thursday, February 17, 2005

Figure 7



Source: City and County of Honolulu, Department of Transportation Services,  
Wednesday, February 16, 2005 to Thursday, February 17, 2005

Figure 8



Source: City and County of Honolulu, Department of Transportation Services,  
Wednesday, February 16, 2005 to Thursday, February 17, 2005

Potential Impacts and Mitigation Measures

Traffic on roadways near the construction work will be temporarily disrupted during installation of the sewer lines and other rehabilitation work. Roadways on which the sewer work will be performed were shown in Figure 2.

To mitigate traffic impacts, a traffic control plan will be developed and submitted to the Department of Planning and Permitting, Traffic Review Branch, for review and approval. Construction will be phased and the contractor will generally be required to limit the work area. Traffic control plans will cover each phase of work. A key purpose of the traffic control plan is to ensure that access to adjoining properties is maintained.

Construction work during peak traffic hours from 7:00 am to 8:30 am and 4:00 pm to 6:00 pm will result in potentially significant adverse traffic impacts. Sewer construction work, particularly with open trenching, is typically limited to non-peak traffic hours between 8:30 am and 3:30 pm, Monday through Friday. However, the DDC will seek extended work hours following consultation with members of the community and with the approval of pertinent agencies. The ability to use roadways until 6:00 pm on weekdays (until 5:00 pm around the shopping centers) will increase the productivity of work crews. The extended hours are needed to shorten the overall project schedule and period of public inconvenience, and to economize on project costs. Open trench and microtunneling construction work may be limited in critical locations during the back-to-school transition period, Thanksgiving weekend, and the Christmas/New Year period. Open trenches will be covered as required with steel plates during non-working hours.

The sewer construction work will require lane closures and detours; however, one lane of traffic will be open at all times for each direction. When it is not possible to keep two-way traffic open during construction hours, special duty officers or flagmen will be utilized. Road closures to through traffic (i.e., open to local traffic only) and use of alternate routes for non-local traffic will be considered to improve traffic flow and safety and expedite the construction work. Work on Keolu Drive will be coordinated with the merchants of Keolu Center and Enchanted Lake Shopping Center, as well as St. John Vianney School, the Department of Education, and other major traffic generators.

Detour opportunities are limited on Keolu Drive since there is no parallel roadway. However, because of the circular configuration, some motorists may avoid construction by going the opposite way around the loop. This may lead to a redistribution of traffic volumes on Keolu Drive. Similarly, during construction on Wanaao Road, traffic may increase on Hamakua Drive and side streets as through drivers seek alternate routes.

Since most of the construction will be done underground by microtunneling, the impact on driveway access will be lower than with open trenching. Nevertheless, there may be occasions when residents in the immediate work area may be inconvenienced by restrictions to driveway access. The Contractor will be required to minimize inconvenience to property owners.

Vehicular and pedestrian access to and from private properties will be provided at all times, or the contractor will be required to provide other suitable temporary accommodations. The Contractor and the City and County will coordinate any temporary closure of private driveways with the affected property owners prior to the closure. Where necessary, parking may be temporarily restricted on both sides of streets.

The Contractor will be required to make provisions for emergency access and will be required to provide full access during non-working hours. Emergency services, including police, fire, and ambulance services, will be notified prior to implementation of any required detours or street closures.

Area residents and businesses will be kept informed of the project prior to and during construction work. Information will be published in the major daily newspapers with a schedule of major construction work, road closures, detours, and suggested alternate routes. Electronic roadside signs will also be used to warn motorists of current and upcoming work. There will be a 24-hour hotline to communicate with the construction manager.

Oahu Transit Service will be contacted at least two weeks prior to the start of any construction affecting bus stops and/or bus routes.

The Contractor will be required to comply with safety precautions and measures prescribed in the "Part VI, Standards and Guides for Traffic Controls for Street and Highway Construction, Maintenance, Utility and Incident Management Operations," of the Manual of Uniform Traffic Control Devices for Streets and Highways published by the Federal Highway Administration. Special-duty police officers and/or contractor personnel will be stationed to facilitate traffic flow and minimize traffic hazards. Construction monitors will verify that work performed in City and County streets is in compliance with permit conditions. Existing traffic control devices that may be damaged or removed during construction will be required to be replaced immediately after construction in the area is completed.

### 3.5 PUBLIC UTILITIES

#### *Drainage System*

The stormwater drainage system is owned and maintained by the City and County. Streets in the project area have underground drainage lines. In addition, there are aboveground drainage channels and swales. The existing network includes 18-, 24, and 30-inch drain line in portions of Keolu Drive between Akalani Loop/Akahai Street and Wanaao Road. There are 18- and 24-inch drain lines in portions of Wanaao Road between Keolu Drive and Auwina Street.

#### *Water System*

Existing underground water lines have been identified along the project alignment. There are 12- to 16-inch water lines under Keolu Drive and 8- to 12-inch lines under Wanaao Road. The DEA and construction plans will be submitted to the Board of Water Supply (BWS) to ensure the protection and integrity of their system.

#### *Sewer System*

The existing sewer line extends along Keolu Drive from Nanialii Street until it veers right onto Wanaao Road, ending at the Kailua Heights WWPS. This line will remain in operation during the construction period, and no disruption of service is expected. In addition, there is a parallel 12-inch relief sewer line on Keolu Drive between Nanialii Street and Hele Street.

#### *Electrical and Gas Systems*

The project site contains existing overhead, underground, and secondary lines. The Hawaiian Electric Company (HECO) will be supplied with 2 sets of pre-final construction drawings and will be contacted to coordinate construction.

There is a 4-inch gas line on portions of Keolu Drive between Akalani Loop/Akahai Street and Wanaao Road. Wanaao Road, between Keolu Drive and Auwina Street, has up to two gas lines measuring from 0.5 to 4 inches in diameter.

#### *Telecommunications Systems*

Existing telecommunication lines are located mostly above ground, but a possible conflict with an underground ductline near the Keolu Drive/Hui Street intersection has been noted. To avoid any possible conflict, Hawaiian Telcom and Oceanic Cable will be provided with a set of detail design plans for review and will be contacted to coordinate construction.

Potential Impacts and Mitigation Measures

Contingency measures will be developed to prevent failure, damage, or collapse of the existing sewer line which will remain operational during construction of the new sewer line system.

Numerous underground gas lines, water line laterals, sewer lines and laterals, and drain lines are nearby or traverse the entire alignment. Intersections are particularly crowded with numerous utilities. All existing utilities in the project area will need to be protected from damage during construction and remain functional throughout construction. Overhead telephone and/or power lines near or in the staging areas and shafts may need to be temporarily relocated during construction. Temporary electrical power will be required at the wastewater pumping station, and the original replaced after construction.

Prior to the start of construction, all affected utility companies will be contacted to verify locations and coordinate construction to ensure the integrity of their systems. The alignment and grade of the proposed sewer line may be adjusted to accommodate any existing utilities. Should relocation of existing lines, cables, or pipes be necessary, the Contractor will obtain approvals from the relevant agencies and utility companies.

**3.6 PUBLIC HEALTH AND SAFETY**

***Police Services***

Kailua falls under the jurisdiction of the Honolulu Police Department's District 4 command which covers the entire Windward side of the island. Police officers serving the area operate out of the Kailua Substation located at 56-470 Kuulei Road, about 3 miles west of the project area.

***Fire Services***

The Windward Coast of Oahu is under the jurisdiction of Battalion 3 of the Honolulu Fire Department. There are two fire stations in the Kailua area, both within 3 miles of the project corridor. The Olomana Fire Station, located at 42-510 Kalaniana'ole Highway, has an engine company; while the Kailua Fire Station, located at 211 Kuulei, has one engine and one ladder.

Potential Impacts and Mitigation Measures

Necessary measures to assure public health and safety will be provided throughout all phases of construction. The Contractor will maintain access by emergency vehicles through the construction site for the duration of the project. The Contractor will provide, install, and maintain all necessary signs, lights, flares, barricades, markers, cones, and other safety facilities. These safety precautions will conform with the "Rules and Regulations Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways," as adopted by the Highway Safety Coordinator and the U.S. Federal Highway Administration. The

Contractor will also contact District 4 police personnel to coordinate adequate police coverage and response.

During construction, the Contractor will maintain fire apparatus access throughout the construction site and notify the Fire Communication Center of any interruption in the existing fire hydrant system.



## 4 LAND USE PLANS, POLICIES, AND CONTROLS

### 4.1 HAWAII STATE PLAN

The Hawaii State Plan, Chapter 226, Hawaii Revised Statutes (HRS), serves as a written guide for the future long-range development of the State by identifying goals, objectives, policies, and priorities. It also provides a basis for determining priorities and allocating limited resources such as public funds, services, manpower, land, energy, and water. Relevant State Plan goals, objectives, policies, and priority guidelines are noted below.

The proposed project would be in conformance with State Plan objectives and policies for facility systems. In general,

“(a) Planning for the State’s facility systems...shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.

“(b) To achieve the general facility systems objective, it shall be the policy of this State to: (1) Accommodate the needs of Hawaii’s people through coordination of facility systems and capital improvement priorities in consonance with state and county plans...and “(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user” (Section 22-14, HRS).

The project also conforms to Section 226-15, Solid and Liquid Wastes, HRS, which lists the following objectives for the planning of the State’s facility systems:

“(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes, and (2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.”

Also, in order to achieve solid and liquid waste objectives, the State’s policy is to:

“(1) Encourage the adequate development of sewerage facilities that complement planned growth...and (3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes” (Section 226-15, HRS).

### 4.2 STATE LAND USE CLASSIFICATION

The State Land Use Commission, pursuant to Chapter 205 and 205A, HRS and Chapter 15-15, Hawaii Administrative Rules, is empowered to classify all lands in the State into one of four land use districts. Most of the project corridor falls within the Urban classification; only the crossing at Kaelepulu Stream is classified in the Conservation District (see Figure 9). The City regulates all activities or uses that fall within the Urban classification.

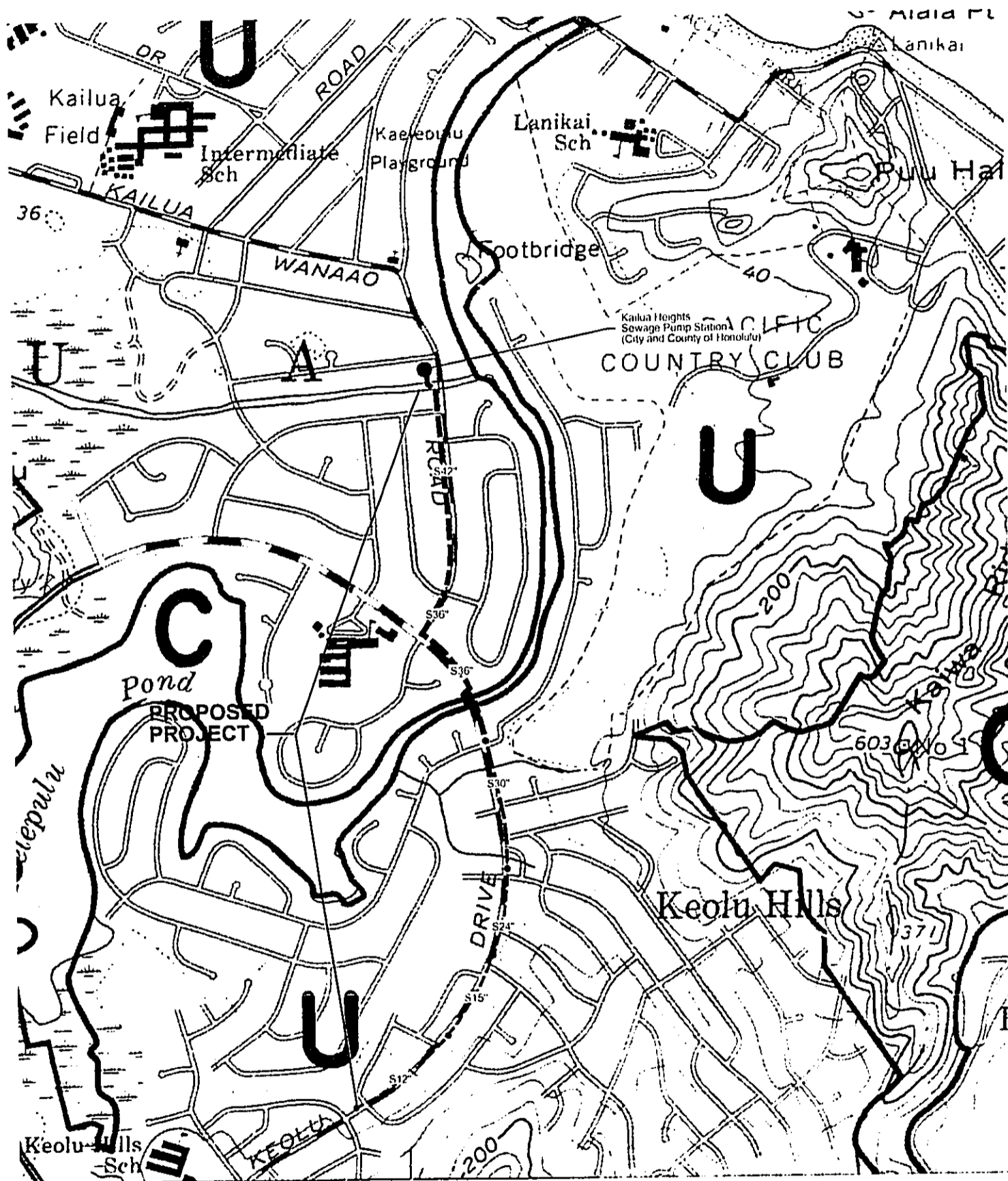


Figure 9  
**State Land Use Districts**  
 Wanaao Road/Keolu Drive  
 Reconstructed Sewer



### 4.3 CITY AND COUNTY OF HONOLULU LAND USE REGULATIONS

#### Koolaupoko Sustainable Communities Plan

Development plans, a mandate of the City Charter, have been adopted by ordinance for eight geographic regions of the island since 1985. The project falls within the Koolaupoko planning area. The Koolaupoko Sustainable Communities Plan was adopted in August 2000. The plan includes a generalized map showing permissible land uses (see Figure 10). The project corridor includes Residential and Commercial uses, with some Public Facility uses in the vicinity.

In comments provided by letter dated December 22, 2000, the Department of Planning and Permitting (DPP) commented:

The proposed replacement appears to be consistent with Section 4.3 of the Koolaupoko Sustainable Communities Plan (SCP) which calls for measures to improve the wastewater collection system by replacing deteriorated sewer lines. Projects such as these are ranked as "Priority One" under Section 5.2.1., Public Improvements Priorities, of the SCP.

DPP further noted that sewage flow is over the design capacity in a portion of the existing sewer line on Wanaao Road and a short section of Keolu Drive, just north of Enchanted Lake Shopping Center. Higher flow capacity sewer lines were recommended to accommodate peak flows. DPP also pointed out that the SCP calls for adding storage capacity for wet-weather flows. The project has been designed with pipes of adequate size to accommodate peak flows and infiltration.

#### County Zoning

Zoning districts along the proposed project corridor are shown in Figure 11 and include:

- R-5 Residential
- R-7.5 Residential
- B-1 Neighborhood Commercial

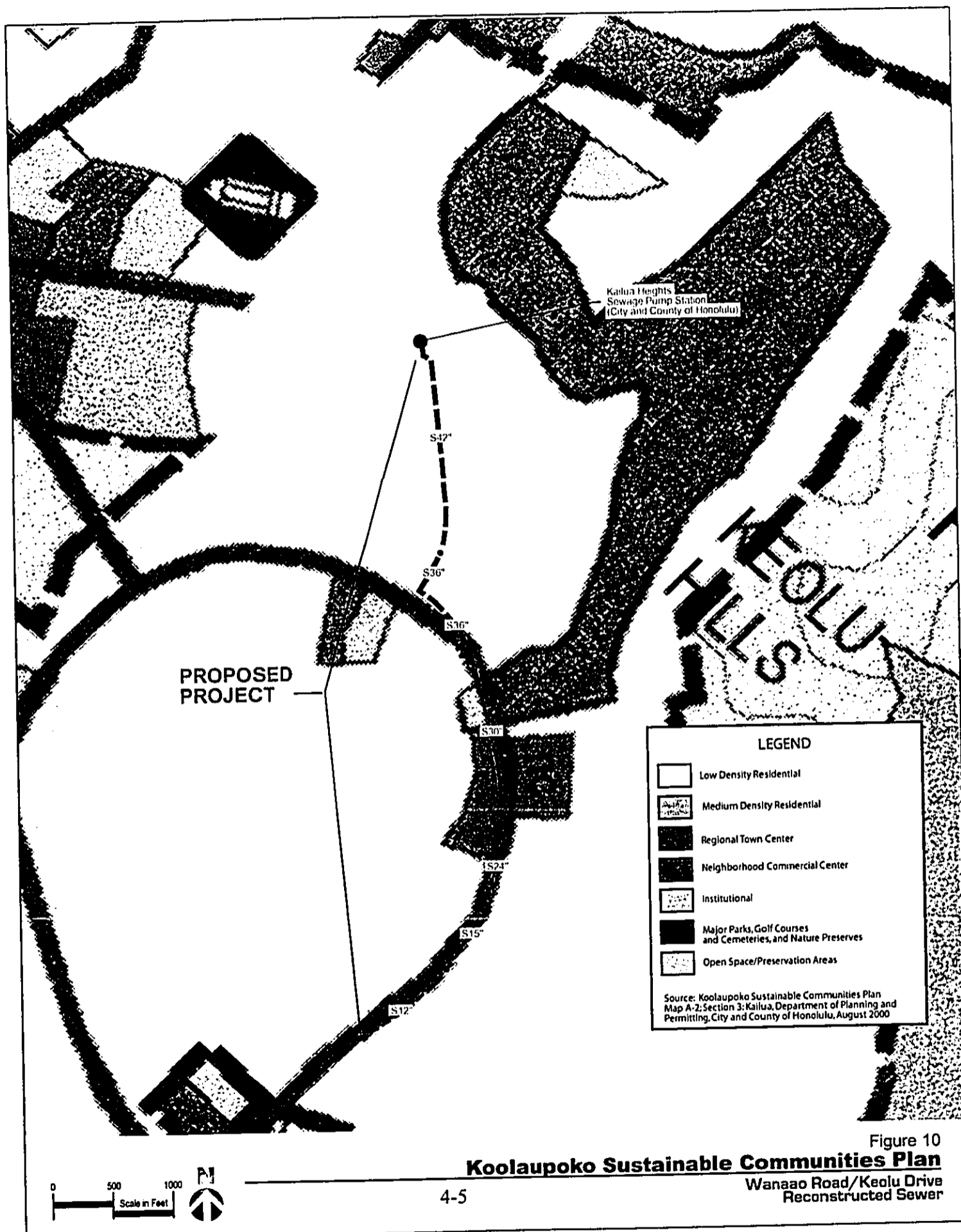
There is also a P-2 zoning district in the vicinity occupied by Mid-Pacific Country Club. There are no special districts in the surrounding area.

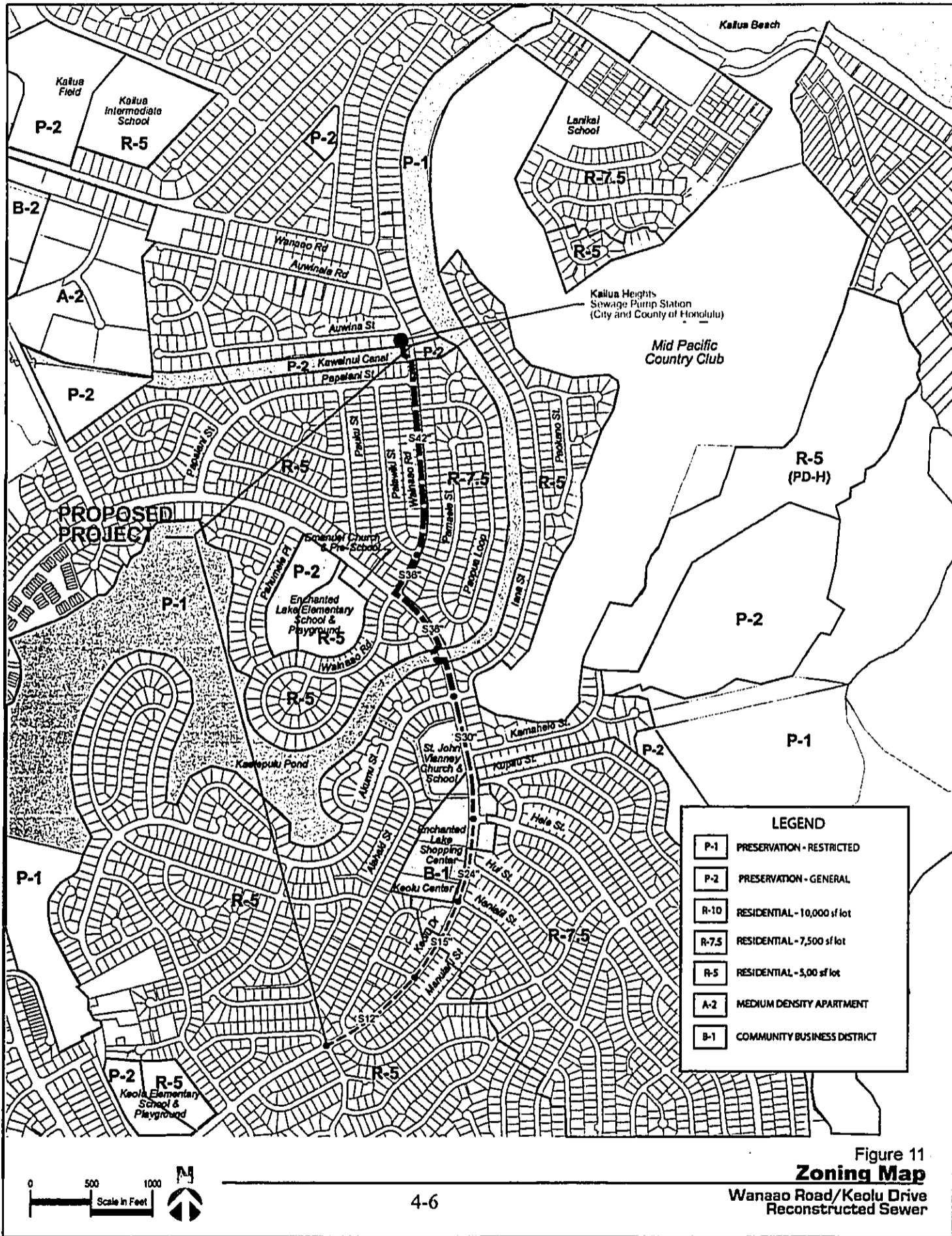
### 4.4 SPECIAL MANAGEMENT AREA

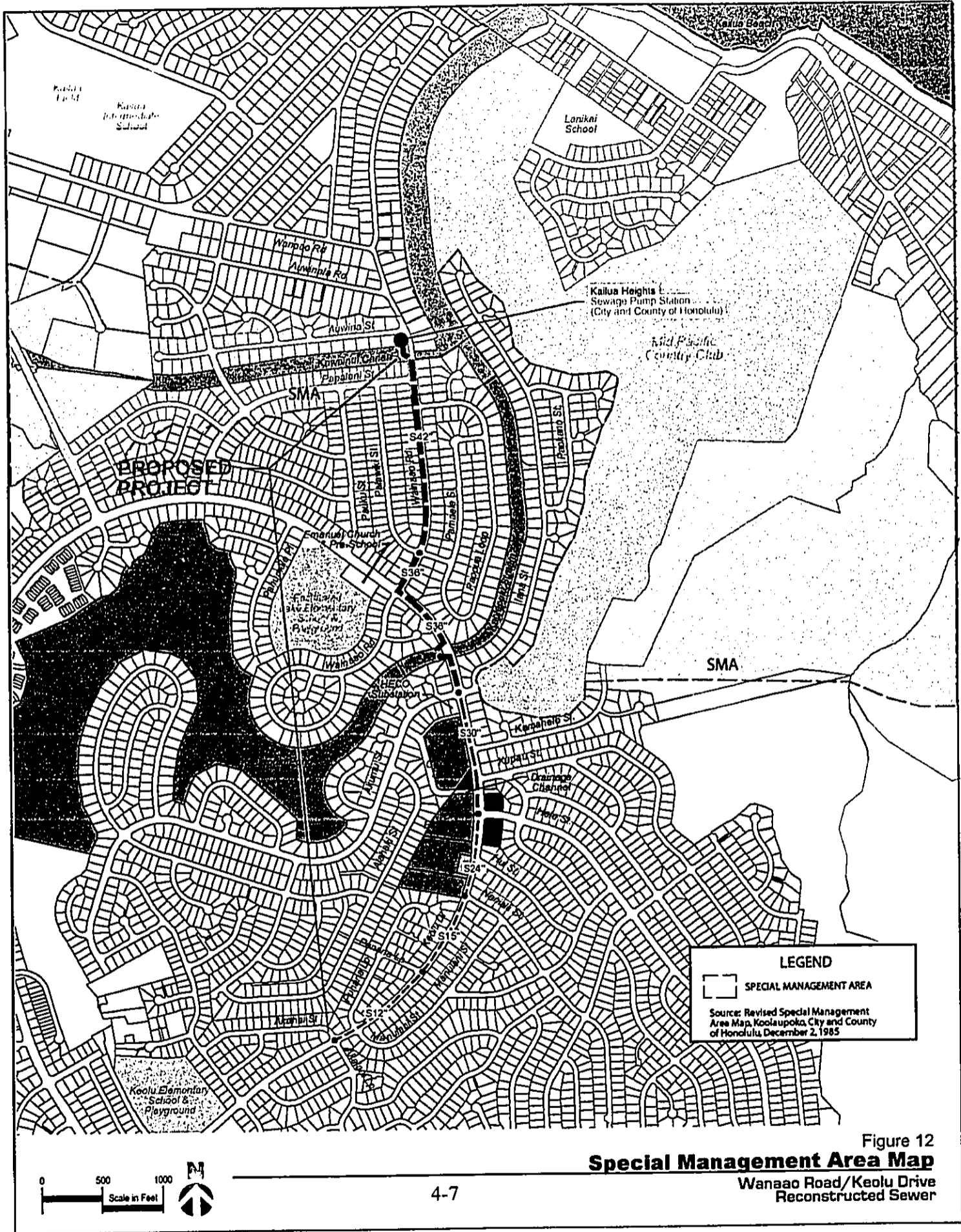
Coastal Zone Management objectives and policies (Section 205A-2, HRS) were developed to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaii. Development within the Special Management Area (SMA) requires a permit, and since this project has a development cost exceeding \$125,000, it will require a Major Special Management Area Use Permit. The permitting process provides a heightened level of

government and public scrutiny to ensure consistency with SMA objectives. Figure 12 shows the boundary demarcating the SMA.

Approximately 500 feet at the downstream end of the proposed pipeline is located inside the SMA. This section extends from the northern end of Paopua Loop to Auwina Street, and includes the Kawainui Canal crossing and the Kailua Heights WWPS.







## 5 POSSIBLE ALTERNATIVES

Various alternatives to improve the Keolu Drive/Wanaao Road sewer line were investigated in detail in the engineering report *Design Alternatives Report* by Sato & Associates (January 2005) and *Preliminary Feasibility Evaluation Report, Gravity Sewer Installation by Microtunneling Methods* by URS (December 2004). This chapter provides a brief summary of the alternatives that were considered and the basis for selecting the preferred design and construction alternatives.

### 5.1 DESIGN ALTERNATIVES

#### 5.1.1 No Action

The "no action" alternative assumes the maintenance of current conditions, i.e. reliance on the existing sewer pipe system. This alternative is not acceptable as studies indicate that the existing system is deteriorated and inadequate. The existing system contains segments flowing in a non-positive direction and peak flows surpassing sewer pipe capacity. There have been previous occurrences of wet water spills. If no action is taken, future spills, especially wet weather spills, are likely to occur to the detriment of those in the community.

#### 5.1.2 Rehabilitate and Add

This alternative involves rehabilitating the existing pipeline with structural lining. A variety of technologies are available, including sliplining and cured-in-place pipe (CIPP). In sliplining, a new pipeline with a diameter smaller than the pipe being repaired is inserted into the defective pipe. Although the process is relatively simple and inexpensive, there is a reduction in flow capacity (35 to 60 percent) depending on the pipe size. CIPP involves placing a fabric tube into a cleaned host pipe. The fabric is impregnated with a thermosetting resin that hardens into a structurally sound, jointless pipe when exposed to hot circulating water or steam. Unlike sliplining, there is no reduction in flow capacity. However, the flow must be completely stopped or by-passed during installation and curing.

To make up for the loss in capacity, or to provide temporary bypass, this alternative also involves the installation of a new sewer line parallel to the existing line. The new sewer line is only intended to carry any additional flow that exceeds the capacity of the existing line. To ensure uninterrupted service, the new sewer line must be completed before the rehabilitation of the existing line can begin; the new line will be the temporary server during this rehabilitation period.

#### 5.1.3 Install and Abandon

This alternative proposes to install a new, larger capacity sewer line adjacent to the existing line. During the installation, the existing line will continue service in the area. Upon the completion of the new line, all service laterals will be connected to the new line and it will become the server



while the existing line will be capped and abandoned in place. The new line would be sized to accommodate all current and projected flows.

Compared to rehabilitating the existing line, installation of a new, larger capacity line offers future benefits, including lower levels of maintenance, greater reliability, and longer design life.

#### 5.1.4 Preferred Design Alternative

Although the rehabilitation option is attractive, as the new pipe can be smaller in size with commensurately lower cost, rehabilitation of the existing pipe is impractical. A field investigation discovered segments of the existing pipe flowing in a non-positive direction. Therefore, those segments would have to be replaced to correct the gravity flow. Moreover, all service connections, valves, bends, and appurtenances would still need to be excavated *individually and connected to the new and/or rehabilitated lines*. Replacing flawed sections of the pipeline in addition to installing an adjacent, entirely new pipe, would be repetitive and costly.

Based on a comparison of the alternatives, abandon and install is the preferred design alternative because it will provide the most reliable, durable, and functional sewer line.

## 5.2 CONSTRUCTION ALTERNATIVES

### 5.2.1 Open Trench

Open trench construction consists of trenching and backfilling to install a new pipe. It is a conventional construction method, therefore most contractors will have the necessary experience; and both manpower and resources are readily available on the island.

Open trenching along the proposed alignment is expected to encounter primarily variable fill materials, very loose lagoonal sands and gravels, and stiff to very stiff alluvial and residual silts, clays, cobbles, and boulders, assuming that the depth of excavation is 1 to 2 feet below the proposed pipe invert. The soil material can be excavated with conventional earthwork equipment.

Groundwater control will be a key factor in construction of the trench and shaft excavations and in determining appropriate support systems for the pipeline. To minimize dewatering discharge quantities, maintain trench and shaft stability, and reduce potential damage to existing utilities and structures from ground surface settlement, trench and shaft excavations extending below the groundwater level would require the construction of a water-tight, full-perimeter trench support and a bottom groundwater cut-off. Depending on excavation depths and subsurface conditions, these could include continuous interlocking sheet piles driven by impact hammers into predrilled holes, contiguous secant caissons, or other suitable full perimeter trench support systems.

### 5.2.2 Microtunneling

Microtunneling is a specialized underground method of constructing pipelines using a remote controlled, laser, or gyroscope-guided, steerable boring machines without the need for personnel to enter the pipe. Therefore, it is conducive to small-diameter pipes (e.g., internal diameters less than 36 to 48 inches). In this method, two pits are excavated—one at either end of the segment—to the depth of the underground shaft. The boring machine in the jacking or launch pit pushes against the wall of the pit to drive the cutting head horizontally through the ground. Once the shaft is cut through, the boring machine is retrieved by crane from the receiving pit. In general, the alignment and profile of the pipeline should be straight, in a series of drives with no curves, in order to avoid stresses that could damage the jacking pipe.

The line and grade accuracy of this method is typically within 1 to 2 inches when properly executed in suitable conditions by skilled operators. Pre-qualification of microtunneling contractors during the bidding period based on past successful performances is particularly important.

### 5.2.3 Horizontal Directional Drilling

Horizontal directional drilling (HDD) involves using sophisticated drilling techniques to drill a pilot hole. The drill bit is tracked in order to steer the hole to the desired line and grade. Various reaming tools are then used to enlarge the pilot hole to the desired size. Drilling mud is used to flush the cuttings from the hole and to stabilize the hole so it does not collapse. When the hole has reached the required size, the pipeline or casing is pulled back into the hole in a single operation. HDD requires space for construction staging at the entry and exit locations.

Typical line and grade accuracy of a pipeline installed by appropriate HDD methods and a skilled work crew is about 2 to 3 feet over a 300-foot long pipe installation, in suitable ground conditions. Larger deviations of the drill path from the design alignment profile are likely when subsurface conditions are unfavorable such as very soft or loose soils. Due to the high level of skills required, HDD contract bidders should be pre-qualified based on proven past experience and performance.

### 5.2.4 Preferred Construction Alternative

Based on the large numbers of utilities, driveways, and narrow roadways, and challenging subsurface soils and groundwater conditions, microtunneling is the preferred method for sewer installation. Microtunneling is able to achieve the accuracy needed for effective gravity flow, while providing the advantages of "trenchless" construction.

Open trenching may be preferable in the higher elevation portion of the alignment where subsurface conditions are expected to be more favorable and smaller pipe are required. However, microtunneling remains a feasible option in this area. Horizontal directional drilling is the preferred method to install a siphon sewer at Kaelepulu Stream.

**6. DETERMINATION**

Based on the information in this document, the proposed project is not expected to generate significant social, economic, cultural, or environmental impacts. Consequently, a Finding of No Significant Impact (FONSI) is warranted, pursuant to the provisions of Subchapter 6 of Chapter 200, Title 11, Hawaii Administrative Rules of the Department of Health.

## 7. FINDINGS AND REASONS SUPPORTING THE DETERMINATION

This Environmental Assessment, prepared in accordance with Chapter 343, HRS, as amended, has found that the potential for adverse impacts associated with the proposed action will not be significant. Because the project involves sewer reconstruction within the road right-of-way, traffic disruptions will be unavoidable. Traffic impacts will be mitigated through construction scheduling and implementation of a traffic plan. Environmental impacts will be temporary and are not expected to have an adverse impact on the long-term environmental quality of the project area.

The potential effects of the proposed action were evaluated based on the significance criteria in Section 11-200-12 (Hawaii Administrative Rules, revised 1996). The following is a summary of potential effects of the action.

### *Significance Criteria*

1. Irrevocable commitment to loss or destruction of natural or cultural resources.

The proposed project will not cause the loss or destruction of any natural or cultural resource. No cultural resources appear to be associated with the project area and the corridor has been altered substantially from its natural state by past roadwork, and the installation and repair of various utilities.

2. Curtailment of the range of beneficial uses of the environment.

The use of public streets for underground utilities is an appropriate, beneficial use of the man-made environment. An efficient and improved sewer system will support the public health needs of residents and businesses in the surrounding area.

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

The proposed project is consistent with the environmental policies, goals, and guidelines defined in Chapter 344, HRS. The project meets essential public health needs and will have a beneficial environmental effect by reducing the risk of sewage spills and adverse water quality impacts from such spills.

4. Substantially affects the economic or social welfare of the community or state.

The proposed project is intended to provide for safe, efficient collection of wastewater through an upgraded and reliable system. Short-term negative impacts are associated with construction related activities—traffic disruptions, construction noise, and dust—but no long-term impacts are foreseen.

5. Substantially affects public health.

The proposed project will be completed in accordance with Federal, State, and City and County of Honolulu rules and regulations governing public safety and health. Primary public concerns involve traffic, noise, and continued service of utilities throughout construction. However, these impacts can be minimized and possibly reduced to negligible levels by following the mitigation measures outlined in this document.

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

The sewer system is owned and operated by the City and County of Honolulu. The proposed project is part of an ongoing effort to improve the collection and disposal of wastewater, and provide for a system that meets current and projected peak flows. The proposed sewer line was sized in response to population and land use needs in the service area and is consistent with the Koolaupoko Sustainable Communities Plan and existing zoning.

7. Involves substantial degradation of environmental quality.

The proposed project is not anticipated to involve substantial degradation of environmental quality and will be short-term in nature. Upon completion of the installation, the environment will be returned to its pre-construction status.

8. Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for large actions.

The proposed project will not have cumulative environmental effects at the local, regional, and/or island-wide levels. It is an independent project that does not involve a commitment to larger actions.

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

The project is located in a long-established urban neighborhood. Although endangered species have been identified at Kaelepulu Pond and adjoining wetlands, the project is not expected to harm those species or their habitat. In addition to the distance from the wetland habitat, the project will use underground construction techniques to minimize disruption to the surface environment.

10. Detrimentially affects air or water quality or ambient noise levels.

During construction, short-term impacts on air and water quality and ambient noise levels may occur. These effects will be minimized by adherence to all pertinent environmental regulations, permit conditions, and Best Management Practices, as specified in the construction contract. Over the long term, the new pipeline will lower the risk of sewage spills with associated water

quality impacts. Because sewer maintenance activities will not be needed as often, opportunities for the emission of associated odors will also decline.

11. The proposed action does not affect 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, freshwater, or costal waters.

The Contractor will be required to implement measures that prevent non-point source emissions from entering the drainage system and local waterways during severe weather events. To avoid damage to the proposed sewers, site conditions have been studied, and the pipeline is being designed for those conditions and in accordance with accepted engineering practice.

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

The new sewer line will be installed underground and will not affect existing scenic vistas and view planes.

13. Requires substantial energy consumption.

Energy will be required for the installation of the sewer line and the subsequent connection of the service laterals, but consumption is not expected to be significant. Upon completion, the new sewer line will rely on gravity operation.

---

## 8. BIBLIOGRAPHY

Akinaka and Associates, Ltd. March 1999. *Final Environmental Assessment for the Kainehe Street, Hamakua Drive, and Keolu Drive Reconstructed Sewer Project*. Prepared for the City and County of Honolulu, Department of Design and Construction.

City and County of Honolulu. Geographic Information System Data Base.

City and County of Honolulu, Department of Public Works. August 1995. *Preliminary Engineering Report, Kalaheo Avenue Relief Sewer*.

Cultural Surveys Hawaii, Inc. (Victoria S. Creed, Hallett H. Hammatt, and David W. Shideler). July 2002. *Traditional and Cultural Practices Assessment for the Wanaao Road and Keolu Drive Sewer Environmental Assessment Study, Kaelepulu, Kailua Ahupuaa, Island of Oahu (TMK 4-02-02)*.

Dingeman, Robbie. "Counterproductive 'Traffic Calmers' to Go" *Honolulu Advertiser*, July 7, 2005.

Engineering Concepts. September 1998. *Final Supplemental Environmental Assessment for Kailua Heights Wastewater Pump Station Modification*. Prepared for the City and County of Honolulu, Department of Environmental Services.

Federal Emergency Management Agency. November 2000. *Flood Insurance Rate Map No. \_\_\_\_\_*.

Geolabs, Inc. April 2002. Preliminary Geotechnical Engineering Exploration Wanaao Road Replacement Sewer, Kailua, Oahu, Hawaii.

Handy, E.S.C., E. G. Handy, and Mary Pukui. 1972. *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Honolulu, HI: Bernice P. Bishop Museum Bulletin 233.

MGD Technologies Inc. February 2000. *Field Investigation*.

Ohashi, Tim J. August 2002. "Wildlife Survey, Wanaao Road Sewage Line, Kailua, Oahu, Hawaii."

ParEn, Inc. dba Park Engineering. April 1999. *Revised Final Environmental Assessment for Kalaheo Avenue Reconstructed Sewer*. Prepared for the City and County of Honolulu, Department of Design and Construction.

Ripperton, J. C. and E. Y. Hosaka. 1942. *Vegetation Zones of Hawaii*. Hawaii Agriculture Experimental Station Bulletin No. 89.

Sato & Associates, Inc. January 2005. *Design Alternatives Report, Wanaao Road Replacement Sewer.*

State of Hawaii. Commission on Water Resource Management. December 1990. *Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources.* Report R84. Prepared by the Hawaii Cooperative Park Service Unit, National Park Service.

State of Hawaii. 1998 and 2000. *The State of Hawaii Date Book.*

United States Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawaii Agriculture Experiment Station. August 1972. *Soil Survey of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii.*

URS. December 2004. *Preliminary Feasibility Evaluation Report, Gravity Sewer Installation by Microtunneling Methods, Wanaao Road Sewer Replacement, Kailua, Oahu, Hawaii.*

Wilson Okamoto & Associates. February 2000. *Final Environmental Impact Statement for the Kailua-Kaneohe-Kahaluu Facilities Plan, Koolaupoko, Oahu, Hawaii.* Prepared for the City and County of Honolulu Department of Design and Construction and Department of Environmental Services.



## 9. CONSULTATION AND COORDINATION

### 9.1 INDIVIDUALS AND ORGANIZATIONS CONSULTED DURING PREPARATION OF THE DEA

Prior to preparing the DEA, the organizations listed below were consulted through written correspondence. Appendix A contains samples of the letters requesting comments on the proposed action. Comments were received from agencies shown with an asterisk (\*) in the list below. Comment letters are reproduced in Appendix A.

The Kailua Neighborhood Board, Transportation Committee, was given a briefing on the project on January 18, 2006 during a regularly scheduled committee meeting.

On January 23, 2006, a public information meeting was held at St. John Vianney School in conjunction with an application to the State Department of Health for a noise variance. Notification flyers for the meeting were distributed to all properties within a 500-foot radius of the project area. Approximately 18 members of the community attended. Notes from the meeting are included in Appendix B.

#### Pre-Assessment Consultation

##### Federal

U.S. Army Corps of Engineers, Pacific Ocean Division\*  
U.S. Department of Interior, Fish and Wildlife Service\*

##### State of Hawaii

Department of Business, Economic Development and Tourism (DBEDT)  
Office of Planning  
Department of Education\*  
Department of Health  
Department of Land and Natural Resources (DLNR)  
State Historic Preservation Division\*  
Office of Hawaiian Affairs  
Representative Cynthia Thielen  
Representative David A. Pendleton  
Representative Joe Gomes  
Senator Bob Hogue  
Senator Fred Hemmings

##### City and County of Honolulu

Board of Water Supply\*  
Department of Environmental Services  
Department of Planning & Permitting\*  
Department of Design & Construction  
Department of Parks & Recreation

Department of Facilities Maintenance  
Department of Transportation Services\*  
Fire Department\*  
Council Member Steve Holmes  
Council Member John Henry Felix

**Utility**

Hawaiian Electric Company\*  
The Gas Company  
Verizon Hawaiian Telephone (now Hawaiian Telcom)\*  
Oceanic Cable

**Community Groups/Businesses/Etc.**

Kailua Neighborhood Board  
Kailua Urban Design Task Force  
Kailua Chamber of Commerce  
Hawaii Thousand Friends  
Sierra Club, Hawaii Chapter  
St. John Vianney Parish\*  
Residents along Keolu Drive and Wanaao Road (95)  
    Maria and William Wilson\*  
Businesses along Keolu Drive (90)  
    Enchanted Lake L&L Inc.\*

**9.2 INDIVIDUALS AND ORGANIZATIONS CONTACTED DURING THE DEA COMMENT PERIOD**

Availability of the Draft Environmental Assessment (DEA) was published by the Office of Environmental Quality Control (OEQC) in the February 8, 2006 issue of the bi-monthly *Environmental Notice*. The notice initiated a 30-day public review and comment period that ended on March 10, 2006. The DEA was distributed to the individuals, agencies, and organizations shown in Table 6. Homeowners (142) and businesses (56) abutting the project corridor also receive written notification. Copies of the DEA were available for review at the Kailua and Waimanalo Public Libraries, Hawaii State Documents Center (Main Library), and Municipal Reference and Records Center.

As of March 24, 2004, two weeks from the 30-day public review and comment period deadline, letters had been received from 12 agencies. A summary of their comments is provided in Table 6. All comment letters and associated responses are appended to this chapter.

In addition, e-mailed messages were sent by four residents on Palawiki Street regarding potential changes in traffic patterns during the construction period and concerns about the safety of children playing and riding bicycles in the narrow roadway. Responding to the residents, DDC Project Engineer Glenn Okita stated that Palawiki Street will not be signed as a detour route.

The Department of Design and Construction considered all comments in determining whether the project will have a "significant impact." In some cases, comments resulted in changes, clarification, or correction to the EA.

**Table 6: Summary of Draft Environmental Assessment Distribution and Comments**

	Received DEA	Provided Comment	Comments
<b>Federal Agencies</b>			
U.S. Army Corps of Engineers, Pacific Ocean Division	•	3/16/06	DA Permit (Section 10) required. DA Permit (Section 404) may be required; determination pending detailed plans.
U.S. Department of Interior, Fish and Wildlife Service	•		
<b>State of Hawaii Agencies</b>			
Department of Business, Economic Development and Tourism (DBEDT) Office of Planning	•		
Department of Education	•		
Department of Health	•	3/6/06	Wastewater plans must conform to DOH rules
Department of Land and Natural Resources (DLNR)	•		
Office of Environmental Quality Control	•	2/21/06	No comments
Office of Hawaiian Affairs	•	3/7/06	Endorse an Archaeological Monitoring Plan. All construction work should stop immediately and the SHPD contacted if significant cultural deposits or human remains are encountered.
State Historic Preservation Division	•	Advance copy via e-mail 3/21/06	Submit Archaeological Monitoring Plan for review
Rep. Pono Chong, District No. 49	•		
Rep. Cynthia Thielen, District No. 50	•		
Rep. Tommy Waters, District No. 51	•		
Senator Bob Hogue, District No. 24	•		

	Received DEA	Provided Comment	Comments
Senator Fred Hemmings, District No. 25	•		
<b>City and County of Honolulu</b>			
Board of Water Supply	•	2/16/06	Submit construction drawings for review and approval
Department of Environmental Services	•		
Department of Facilities Maintenance	•	3/8/06	Concern about adequate compaction of backfill with open trench construction Request that DEA address the possibility of filling the abandoned sewer pipes.
Department of Parks & Recreation	•	2/22/06	No comments
Department of Planning & Permitting	•	3/10/06	Major SMP or utility easement needed for the crossing at Kawainui Canal
Department of Transportation Services	•		
Fire Department	•	3/2/06	Maintain fire equipment access through construction site Maintain access to fire hydrants
Police Department	•	2/21/06	No significant impacts if planned mitigation measures are employed
Councilmember Barbara Marshall, District No. 3	•		
<b>Utilities</b>			
Hawaiian Electric Company	•		
The Gas Company	•	2/13/06	Request continued coordination to minimize potential conflicts with existing gas facilities
Hawaiian Telcom	•		
Oceanic Times Warner Cable	•		
<b>Community Groups and Businesses</b>			
Emmanuel Episcopal Church and Pre-School	•		
Enchanted Lake Shopping Center	•		

	Received DEA	Provided Comment	Comments
Kailua Neighborhood Board, No. 31	•		
Kailua Chamber of Commerce	•		
Keolu Center	•		
St. John Vianney Parish and School	•		
Waimanalo Neighborhood Board, No. 32	•		
<b>Media</b>			
Honolulu Advertiser	•		
Honolulu Star-Bulletin	•		
<b>Others</b>			
Residents on Palawiki Street <ul style="list-style-type: none"> <li>• Tricia Komae</li> <li>• Kristen Lemonds</li> <li>• Kathleen Meier</li> <li>• Doug Borton and family</li> </ul>			Concern about increased, high-speed traffic on Palawiki Street if used as a detour route during construction on Wanaao Road.



REPLY TO  
ATTENTION OF

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

March 16, 2006

Regulatory Branch

File No. POH-2006-75

Department of Design and Construction  
Attn: Mr. Carl Arakaki  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

This responds to your request for review of the Draft Environmental Assessment (DEA) for the Wanaao Road/Keolu Drive Reconstructed Sewer, Kailua, Koolaupoko District, Oahu. We have reviewed the document with respect to the Corps' authority to issue Department of the Army (DA) permits under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344). All work or structures in or affecting the course, condition, location or capacity of navigable waters, including tidal wetlands, require DA authorization pursuant to Section 10. Activities involving the discharge of dredged or fill material into waters of the United States, including adjacent wetlands, require a DA permit pursuant to Section 404.

The proposed project would include crossings of Kawainui Canal, Kaelepulu Stream, and an unnamed drainage channel which discharges into Kaelepulu Pond. The DEA identifies micro tunneling as the preferred construction method for crossing Kawainui Canal and horizontal directional drilling as the proposed method for crossing Kaelepulu Stream; it leaves unspecified the method to be used at the unnamed drainage channel. A potential alternative construction method identified in the DEA, conventional trenching, would involve temporary stream diversion.

Kawainui Canal, Kaelepulu Stream, and the unnamed drainage channel are tributary to navigable waters of the United States. At the locations of the proposed crossings, these water bodies are considered to be tidally influenced and thus subject to the Corps' regulatory authority under both Section 10 and Section 404.

Based on the information provided in the DEA, I have determined that construction of the proposed crossings would involve work or structures in or affecting navigable waters of the U.S.; therefore, a DA permit is required pursuant to Section 10. I have further determined that any discharge of dredged or fill material associated with the proposed work will also require DA authorization pursuant to Section 404. We can provide a final determination of DA permit requirements for the project when plans for the proposed crossings are further developed and delineated with respect to the water bodies which are present. Please send us a copy of the Final EA when it becomes available.

Copies of this letter are being mailed to the State of Hawaii Office of Environmental Quality Control and to Kimura International.

Should you have questions concerning this determination, please contact Mr. Peter Galloway of my staff by telephone at (808) 438-8416 or by fax at (808) 438-4060. Written inquiries should cite the above file number and sent to: Regulatory Branch (CEPOH-EC-R/P. Galloway); U.S. Army Engineer District, Honolulu; Building 230; Fort Shafter, Hawaii 96858-5440.

Sincerely,



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



KIMURA INTERNATIONAL INC.

March 22, 2006

Mr. George P. Young  
Chief, Regulatory Branch  
U.S. Army Engineer District, Honolulu  
Ft. Shafer, HI 96858-5440

Dear Mr. Young,

Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by letter dated March 16, 2006.

We acknowledge your determination that a Department of Army (DA) permit is required under Section 10 of the Rivers and Harbors Act of 1899, and that a Section 404 Permit under the Clean Water Act is required if there is any discharge of dredged or fill material. Project engineers will continue to consult with your staff as more detailed plans for the waterway crossings are developed. A copy of the Final Environmental Assessment will be sent to your office.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999



LINDA LINGLE  
GOVERNOR OF HAWAII



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

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

In reply, please refer to:

EPO-06-038

March 6, 2006

RECEIVED MAR 13 2006

Ms. Nancy Nishikawa  
Kimura International  
1600 Kapiolani Boulevard, Suite 1610  
Honolulu, Hawaii 96814

Dear Ms. Nishikawa:

**SUBJECT:** Draft Environmental Assessment for the Proposed Wanaao/Keolu Drive  
Reconstructed Sewer at Kailua, Koolaupoko District, Oahu, Hawaii  
TMK: (1) 4-2-019, 021-022, 024-025, 027-030, 039-041, 046, 049-050,  
075, 080

Thank you for allowing us to review and comment on the subject application. The application was routed to the various branches of the Environmental Health Administration. We have the following Wastewater Branch.

Wastewater Branch

We have reviewed the subject document which proposes to replace an existing trunk sewer line through a section of Kailua in the Koolaupoko District of Oahu.

We have no objections to the proposed construction and are always pleased with the upgrading of existing systems to treat and dispose of our wastewater in the best possible ways. We encourage the use of recycled water in major common areas for irrigation of landscaping and other open areas.


All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater System." We do reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please contact the Planning & Design Section of the Wastewater Branch at (808) 586-4294.

We strongly recommend that you review all of the Standard Comments on our website: [www.state.hi.us/health/environmental/cnv-planning/landuse/landuse.html](http://www.state.hi.us/health/environmental/cnv-planning/landuse/landuse.html). Any comments specifically applicable to this application should be adhered to.

Ms. Nishikawa  
March 6, 2006  
Page 2

If there are any questions about these comments please contact Jiakai Liu with the Environmental Planning Office at 586-4346.

Sincerely,



KELVIN H. SUNADA, MANAGER  
Environmental Planning Office

c: EPO  
WWB





KIMURA INTERNATIONAL INC.

March 22, 2006

Mr. Kevin H. Sunada, Manager  
Environmental Planning Office  
Department of Health  
P.O. Box 3378  
Honolulu, HI 96801-3378

Dear Mr. Sunada,

Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by letter dated March 6, 2006.

We acknowledge that all wastewater plans must conform with applicable provisions in the Department of Health's rules. Detailed wastewater plans will be submitted for review and approval.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999

LINDA LINGLE  
GOVERNOR OF HAWAII



GENEVIEVE SALMONSON  
DIRECTOR

**STATE OF HAWAII**  
**OFFICE OF ENVIRONMENTAL QUALITY CONTROL**

235 SOUTH BERETANIA STREET  
SUITE 702  
HONOLULU, HAWAII 96813  
TELEPHONE (808) 586-4185  
FACSIMILE (808) 586-4186  
E-mail: oeqc@health.state.hi.us

February 21, 2006

Richard Schiavoni, Director  
Department of Design & Construction  
650 South King Street, 11<sup>th</sup> floor  
Honolulu, Hawaii 96813

Attn: Carl Arakaki

Dear Mr. Schiavoni:

Subject: Draft Environmental Assessment (EA)  
Wanao Road/Keolu Drive Reconstructed Sewer

We have no comments to offer at this time. If you have any questions, call Nancy Heinrich at 586-4185.

Sincerely,

GENEVIEVE SALMONSON  
Director

c: Nancy Nishikawa, Kimura International

...



PHONE (808) 594-1888

FAX (808) 594-1855



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
711 KAPIOLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

HRD06/2271

March 7, 2006

RECEIVED MAR 13 2006

Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

**RE: Draft Environmental Assessment for the Proposed Wanaao Road Keolu Drive Sewer Reconstruction, Kailua, O'ahu, TMK: 4-2-19, 21-22, 24-25, 27-30, 39-41, 49-50, 75 and 80).**

Dear Mr. Arakaki,

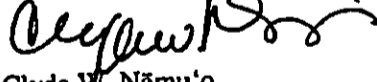
The Office of Hawaiian Affairs (OHA) is in receipt of your February 9, 2006 request for comment on the above listed proposed project. OHA offers the following comments:

As is mentioned on page 3-24 of the Draft Environmental Assessment, an Archaeological Monitoring Plan should be drafted in support of the proposed project. The plan will stipulate the scope and need for archaeological monitoring as is appropriate.

OHA asks that, in accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawaii Administrative Rules, if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD/DLNR) shall be contacted.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck, Native Rights Policy Advocate, at (808) 594-0239 or [jessey@oha.org](mailto:jessey@oha.org).

'O wau iho nō,

  
Clyde W. Nāmu'o  
Administrator

CC: Ms. Genevieve Salmonson, Director  
Office of Environmental Quality Control  
235 South Beretania Street, Suite 702  
Honolulu, HI 96813

✓ Nancy Nishikawa  
Kimura International, Inc.  
1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814



KIMURA INTERNATIONAL INC.

March 22, 2006

Mr. Clyde Nāmu'o  
Administrator  
Office of Hawaiian Affairs  
711 Kapiolani Boulevard, Suite 500  
Honolulu, HI 96813

Dear Mr. Nāmu'o,  
Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by letter dated March 7, 2006.

We acknowledge your agency's call for an archaeological monitoring plan as discussed in the Draft Environmental Assessment. Please be assured that if any significant cultural deposits or human skeletal remains are encountered, work in the vicinity will be stopped immediately and the State Historic Preservation Division will be contacted.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999

LINDA LINGLE  
GOVERNOR OF HAWAII



**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA  
DEPUTY DIRECTOR - LAND

DEAN NAKANO  
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
IMMATING 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

March 21, 2006

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawai'i 96813

LOG NO: 2006.0819  
DOC NO: 0603CM75  
Archaeology

Dear Mr. Arakaki:

**SUBJECT: Chapter 6E-8 Historic Preservation Review [City & County] –  
Draft Environmental Assessment, Wanao Road/Keolu Drive Reconstructed Sewer  
Kailua Ahupua'a, Ko'olaupoko District, Island of O'ahu  
TMK: (1) 4-2-various plats and parcels**

Thank you for the opportunity to review the aforementioned project, which we received on February 9, 2006. The proposed undertaking involves excavation for, and installation of, approximately 6,600 linear feet (1.25 miles) of sewer lines and associated appurtenances.

We have commented twice on this proposed project in 2000 (LOG NO: 25511, DOC NO: 0005EJ29; LOG NO: 26604, DOC NO: 0011EJ19). In both documents, we recommended the implementation of an archaeological monitoring program, in order to mitigate against any "adverse effects" to historic sites that may be present below the ground surface. We believe these earlier comments are still valid, and we look forward to reviewing an archaeological monitoring plan, in accordance with Hawai'i Administrative Rules (HAR) Chapter 13-279.

Thank you for consulting our office on this project. Please contact Dr. Chris Monahan at (808) 692-8024 if you have any questions about this letter.

Aloha,

Melanie Chinen, Administrator  
State Historic Preservation Division

CM

Cc: Ms. Nancy Nishikawa, Kimura International, Inc.  
Director, OEQC



KIMURA INTERNATIONAL INC.

March 28, 2006

Ms. Melanie Chinen, Administrator  
State Historic Preservation Division  
Dept. of Land and Natural Resources  
601 Kamokila Boulevard, Room 555  
Kapolei, HI 96707

Dear Ms. Chinen,

**Wanaao Road/Keolu Drive Reconstructed Sewer**

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by letter dated March 21, 2006.

The DDC has started preparing an archaeological monitoring plan for the project and will be sending it to your office for review and approval when completed.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 □ Fax: 808 941-8999



**BOARD OF WATER SUPPLY**

CITY AND COUNTY OF HONOLULU  
630 SOUTH BERETANIA STREET  
HONOLULU, HI 96843



MUFI HANNEMANN, Mayor

RANDALL Y. S. CHUNG, Chairman  
HERBERT S. K. KAOPUA, SR.  
SAMUEL T. HATA  
ALLY J. PARK

RODNEY K. HARAGA, Ex-Officio  
LAVERNE T. HIGA, Ex-Officio


CLIFFORD P. LUM  
Manager and Chief Engineer

DONNA FAY K. KIYOSAKI  
Deputy Manager and Chief Engineer

RECEIVED FEB 18 2006

February 16, 2006

TO: CARL ARAKAKI  
DEPARTMENT OF DESIGN AND CONSTRUCTION

FROM:   
KEITH SHIDA  
CUSTOMER CARE DIVISION

SUBJECT: YOUR LETTER OF FEBRUARY 8, 2006 ON THE DRAFT  
ENVIRONMENTAL ASSESSMENT FOR WANAAO ROAD/ KEOLU DRIVE  
RECONSTRUCTED SEWER, TMK: 4-2-19, 21-22, 24-25, 27-30, 39-41, 46,  
49-50, 75, 80

Thank you for your letter on the proposed Wanaao Road/ Keolu Drive Reconstructed Sewer.

The construction drawings for the proposed improvements should be submitted for approval.

The construction schedule should be coordinated to minimize impacts to the community and the water system.

If you have any questions, please contact Robert Chun at 748-5443.

cc: Director, Office of Environmental Quality Control  
~~Nancy Nishikawa, Kimura International~~



KIMURA INTERNATIONAL INC.

March 22, 2006

Mr. Keith Shida  
Customer Care Division  
Honolulu Board of Water Supply  
630 South Beretania Street  
Honolulu, HI 96843

Dear Mr. Shida,

Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by memorandum dated February 16, 2006.

We acknowledge the need to submit construction drawings for review and approval by your agency. A concerted effort is being made to develop project plans that will minimize impacts to the community and the water system.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

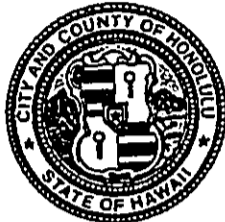
C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999

DEPARTMENT OF FACILITY MAINTENANCE  
**CITY AND COUNTY OF HONOLULU**  
1000 ULUOHIA STREET, SUITE 215, KAPOLEI, HAWAII 96707  
TELEPHONE : (808) 692-5054 FAX: (808) 692-5857  
Website: www.honolulu.gov

MUFI HANNEMANN  
MAYOR

RECEIVED MAR 14 2006



LAVERNE HIGA, P.E.  
DIRECTOR AND CHIEF ENGINEER

GEORGE K. MIYAMOTO  
DEPUTY DIRECTOR

IN REPLY REFER TO:  
DRM 06 -195

March 8, 2006

MEMORANDUM

TO: EUGENE LEE, P.E., DEPUTY DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

FROM: *Laverne Higa*  
LAVERNE HIGA, P.E., DIRECTOR AND CHIEF ENGINEER  
DEPARTMENT OF FACILITY MAINTENANCE

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)  
WANAAO ROAD/KEOLU DRIVE RECONSTRUCTED SEWER

The following are our comments to the DEA for the subject sewer replacement project sent to us by Kimura International, Inc.

We support microtunneling and directional drilling methods of sewer line replacement. To lessen the impact on project roadways, we request that open trench construction be kept to a minimum and utilized only where less destructive methods may not be feasible.

A problem inherent with open trench construction is adequate compaction of the backfill. Therefore, we request that flowable fill or Controlled Low Strength Material (CLSM) be evaluated and/or considered for use as backfill material.

We are concerned with the integrity of the existing sewer lines that will be abandoned in place. The DEA states that the existing sewer lines are "vulnerable to structural and corrosion failure," "heavily deteriorated," and have "exposed rebar, holes in the sewer line and sags in the pipe." However, the project proposes to cap the existing pipes and abandon in place. Should these pipes which are vulnerable to structure failure and are heavily deteriorated, collapse some time in the future, sink holes may develop within the roadway creating a potential hazard as well as require reconstruction of the roadway. We request the DEA address this possibility and consider filling the abandoned pipes with flowable fill or CLSM.

Should you have any questions, please call Charles Pignataro of the Division of Road Maintenance, at 484-7697.

cc: Kimura International  
Office of Environmental Quality Control



KIMURA INTERNATIONAL INC.

March 22, 2006

Ms. Laverne Higa, P.E.  
Director and Chief Engineer  
Department of Facility Maintenance  
1000 Uluohia Street, Suite 215  
Kapolei, HI 96707

Dear Ms. Higa,

Wanao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by memorandum dated March 8, 2006.

We acknowledge your agency's preference for "trenchless" construction methods, such as microtunneling and directional drilling to minimize impacts on roadways in the project area.

We also note your concern about the disposition of the existing sewer lines. The DDC and its engineering consultants are studying options for the abandoned pipes to minimize future impacts on surrounding infrastructure, including the possibility of filling them with flowable fill or Controlled Low Strength Material (CLSM). A follow-up memo will be sent to your office when a course of action has been determined.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999

RECEIVED FEB 22 2006

February 22, 2006

TO: EUGENE C. LEE, DEPUTY DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

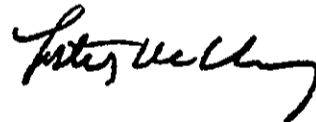
FROM: LESTER K. C. CHANG, DIRECTOR

SUBJECT: WANA AO ROAD/KEOLU DRIVE RECONSTRUCTED SEWER

Thank you for the opportunity to review and comment on the Wanaao Road/Keolu Drive Reconstructed Sewer.

The Department of Parks and Recreation has no comment on this project and as it will not impact any of our programs or facilities, you are invited to remove us as a consulted party to the balance of the Environmental Impact Statement process.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.



LESTER K. C. CHANG  
Director

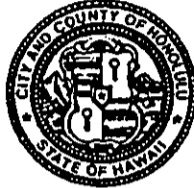
LKCC:mk  
(140378)

cc: State Office of Environmental Quality Control  
~~Ms.~~ Nancy Nishikawa, Kimura International

DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 7<sup>TH</sup> FLOOR • HONOLULU, HAWAII 96813  
PHONE: (808) 523-4432 • FAX: (808) 527-6743  
DEPT. WEB SITE: [www.honolulu.gov/dop](http://www.honolulu.gov/dop) • CITY WEB SITE: [www.honolulu.gov](http://www.honolulu.gov)

MUFI HANNEMANN  
MAYOR



HENRY ENG, FAICP  
DIRECTOR

DAVID K. TANOUÉ  
DEPUTY DIRECTOR

2006/ELOG-307(ry)

March 10, 2006

RECEIVED MAR 15 2006

**MEMORANDUM**

TO: RICHARD SCHLAVONI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

ATTN: CARL ARAKAKI, CIVIL ENGINEER  
WASTEWATER DIVISION

FROM: *fn* HENRY ENG, FAICP, DIRECTOR *Henry Eng*  
DEPARTMENT OF PLANNING AND PERMITTING

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)  
WANAAO ROAD/KEOLU DRIVE RECONSTRUCTED SEWER  
KAILUA, KOOLAUPOKO

We have reviewed the subject draft environmental assessment and have the following comments:

1. Pursuant to Revised Ordinances of Honolulu Section 25-1.3(2)(M), installation of underground utility lines and appurtenant above-ground fixtures less than four (4) feet in height along existing corridors (e.g., rights-of-way) is exempt from Major Special Management Permit (SMP) requirements. It is difficult to determine whether the portion of the project which crosses under the stream channel within the Special Management Area requires a Major SMP. The DEA lacks detailed information on this portion. Therefore, please provide in the Final Environmental Assessment, adequate details to confirm whether any portions of the project located within the Special Management Area are outside of the City's rights-of-way or other existing corridors. Any portion of the reconstructed sewer line located within the SMA but not within existing corridors and which together, exceed \$125,000 in cost, will be subject to Major SMP review.
2. With respect to Table 2 on page 2-13, under City and County of Honolulu, Department of Planning and Permitting, please revise "Permit to Discharge Effluent (Temporary)" to "Construction Dewatering Permit."
3. The project does not appear to require a "Grubbing, Grading and Stockpiling Permit". In addition, please submit a subdivision application for the creation of new easements and submit construction plans to the Site Development Division for One Time Review.

Richard Schiavoni, Director  
Department of Design and Construction  
March 10, 2006  
Page 2

4. Information on page 3-13 relating to the Grading Ordinance should be updated.

Thank you for the opportunity to comment. If you have any questions, please contact Raymond Young of our staff at 527-5839.

HE:lh  
Doc. 433289

cc: OEQC  
~~Kimura International~~



KIMURA INTERNATIONAL INC.

March 22, 2006

Mr. Henry Eng  
Director  
Department of Planning and Permitting  
650 South King Street, 7<sup>th</sup> Floor  
Honolulu, HI 96813

Dear Mr. Eng,

Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by memorandum dated February 21, 2006.

Regarding the sewerline crossing under Kawainui Canal (Comment 1), the proposed alignment will lie mauka of the Wanaao Road bridge. Therefore, it lies outside the City's road right-of-way. The new sewer pipes will be in a corridor that contains the existing sewerline and a waterline; however, it is not an established utility easement. The DDC acknowledges that a Major Special Management Permit may be needed and will continue to work with your staff to meet the requirements of Section 25-1.3(2)(M), Revised Ordinances of Honolulu.

Other changes have been made to the EA per your comments 2-4.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999



HONOLULU FIRE DEPARTMENT  
**CITY AND COUNTY OF HONOLULU**

636 SOUTH STREET • HONOLULU, HAWAII 96813  
TELEPHONE: (808) 723-7139 • FAX: (808) 723-7111 • INTERNET: www.honolulufire.org



MUFI HANNEMANN  
MAYOR

KENNETH G. SILVA  
FIRE CHIEF

ALVIN K. TOMITA  
DEPUTY FIRE CHIEF

March 2, 2006

RECEIVED MAR 09 2006

TO: EUGENE C. LEE, DEPUTY DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

ATTN: CARL G. ARAKAKI, CIVIL ENGINEER  
PROJECT PLANNING EAST

FROM: ALVIN K. TOMITA, ACTING FIRE CHIEF

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT  
WANAAO ROAD/KEOLU DRIVE RECONSTRUCTED SEWER  
KAILUA, KOOLAUPOKO DISTRICT, OAHU  
TAX MAP KEYS: 4-2-019: 021-022, 024-025, 027-030, 039-041,  
046, 049-050, 075, AND 080

In response to a letter dated February 8, 2006, from Ms. Nancy Nishikawa of Kimura International, Inc., regarding the above-mentioned project, the Honolulu Fire Department (HFD) requires that you comply with the following for the duration of the project:

1. Maintain fire apparatus access throughout the construction site.
2. Maintain access to fire hydrants. Please notify the HFD's Fire Communication Center at 523-4411 regarding any interruption of the existing fire hydrant system.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 723-7151.

*Alvin K. Tomita*

ALVIN K. TOMITA  
Acting Fire Chief

AKT/SK:jl

cc: Genevieve Salmonson, Office of Environmental Quality Control  
Nancy Nishikawa, Kimura International, Inc.



KIMURA INTERNATIONAL INC.

March 22, 2006

Alvin K. Tomita  
Acting Fire Chief  
Honolulu Fire Department  
636 South Street  
Honolulu, HI 96813

Dear Chief Tomita,

Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by memorandum dated March 2, 2006.

We acknowledge the Fire Department's requirements for continuous access through the construction site and access to fire hydrants in the project area. Although interruption of the fire hydrant system is not anticipated, the Fire Department will be notified in any such event.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

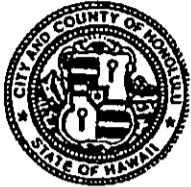
C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999

POLICE DEPARTMENT  
**CITY AND COUNTY OF HONOLULU**

801 SOUTH BERETANIA STREET  
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111  
<http://www.honolulu.org>  
<http://www.honolulupd.org>  
[www.honolulu.gov](http://www.honolulu.gov)

MUFI HANNEMANN  
MAYOR



BOISSE P. CORREA  
CHIEF

GLEN R. KAJIYAMA  
PAUL D. PUTZULU  
DEPUTY CHIEFS

OUR REFERENCE BS-KP

February 21, 2006

RECEIVED FEB 23 2006

TO: EUGENE C. LEE, P.E., DEPUTY DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

ATTENTION: CARL ARAKAKI, CIVIL ENGINEER, WASTEWATER DIVISION

FROM: BOISSE P. CORREA, CHIEF OF POLICE  
HONOLULU POLICE DEPARTMENT

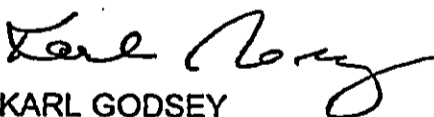
SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT, WANAAO ROAD/KEOLU  
DRIVE RECONSTRUCTED SEWER, TMKS: 4-2-19, 21-22, 24-25,  
27-30, 39-41, 46, 49-50, 75, AND 80

Thank you for the opportunity to review and comment on the subject project.

Assuming that all planned mitigation measures are employed, this project should have no significant impact on the facilities or operations of the Honolulu Police Department.

If there are any questions, please call Major Susan Dowsett of District 4 at 247-2166 or Mr. Brandon Stone of the Executive Bureau at 529-3644.

BOISSE P. CORREA  
Chief of Police

By   
KARL GODSEY  
Assistant Chief of Police  
Support Services Bureau

cc: ✓ Ms. Nancy Nishikawa  
Kimura International  
Ms. Genevieve Salmonson  
OEQC

*Serving and Protecting with Aloha*



KIMURA INTERNATIONAL INC.

March 22, 2006

Assistant Police Chief Karl Godsey  
Support Service Bureau  
Honolulu Police Department  
801 South Beretania Street  
Honolulu, HI 96813

Dear Asst. Police Chief Godsey,

Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by memorandum dated February 21, 2006.

We acknowledge your assessment that there will be no significant impact on the operations of the Police Department provided that mitigation measures are implemented as proposed.

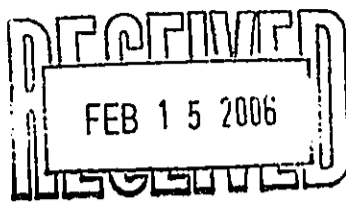
Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999



P.O. Box 3000  
Honolulu, Hawaii 96802-3000

February 13, 2006

Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Attention: Mr. Carl Arakaki

Gentlemen:

Subject: Draft Environmental Assessment for  
Wanaao Road/Keolu Drive Reconstructed Sewer

Please be advised that The Gas Company, LLC maintains underground utility gas mains in the project vicinity, which serves commercial and residential customers in the area and is interconnected with the utility network in Kailua. We would appreciate your consideration during the project planning and design process to minimize any potential conflicts with the existing gas facilities in the project area.

Thank you for the opportunity to comment on the Draft Environmental Assessment. Should there be any questions, or if additional information is desired, please call Stason Nishimura at 594-5689.

Sincerely,

Charles E. Calvet, P.E.  
Manager, Engineering

CEC:lrs  
06-108

cc: Director, Office of Environmental Quality Control  
Ms. Nancy Nishikawa, Kimura International



KIMURA INTERNATIONAL INC.

March 22, 2006

Mr. Charles E. Calvet, P.E.  
Manager, Engineering  
The Gas Company  
P.O. Box 3000  
Honolulu, HI 96802-3000

Dear Mr. Calvet,

Wanaao Road/Keolu Drive Reconstructed Sewer

On behalf of our client, the City and County of Honolulu, Department of Design and Construction, thank you for comments on the Draft Environmental Assessment sent by letter dated February 13, 2006.

We acknowledge the presence of underground gas mains in the project area. Project engineers and designers will coordinate with your staff to minimize potential conflicts with existing gas facilities.

Thank you for participating in the environmental review process.

Sincerely,  
KIMURAINTERNATIONAL, INC.

Nancy Nishikawa  
Senior Planner

C: Carl Arakaki, DDC  
Glenn Okita, DDC  
Clifford Arakawa, Sato & Associates, Inc.

1600 Kapiolani Blvd., Suite 1610  
Honolulu, HI 96814  
Tel: 808 944-8848 • Fax: 808 941-8999

**From:** Okita, Glenn [gokita@honolulu.gov]  
**Sent:** Friday, March 03, 2006 8:45 AM  
**To:** Patricia Komae, KMS Hawaii; Kristen Lemonds; Kathleen S. Meier; Doug Borton  
**Cc:** Marshall, Barbara; chinenjon@yahoo.com; kailuahbmike@hawaii.rr.com; Dowsett, Susan; henry40ford@hotmail.com; joshwisch@yahoo.com; Clifford Arakawa (E-mail); James Kwong (E-mail); Jeff Argov (E-mail); Liana Choy (E-mail); Kathy Bryant- Hunter (E-mail); Chee, Harvey; Inouye, Guy; Franklin, Eldon; Nancy Nishikawa (E-mail)  
**Subject:** Traffic Issues - Wanaao Rd/Keolu Dr. Reconstructed Sewer Project  
To Concerned Residents on Palawiki Street (parallel to Wanaao Rd.): Your e-mails are attached below.

We would like to thank you for your input and for bringing to our attention your traffic concerns along Palawiki Street that may arise during construction of our upcoming sewer project. To provide you with a little background of our project, the work along Wanaao Road will consist of 2 parts: 1). Installing a new 36" pipe using a trenchless technology called microtunneling, which involves jacking pipe beneath the road surface from a jacking shaft to a receiving shaft, and 2). Open trench installation of shallower 8" sewer lines that collect flows from individual service laterals. During microtunneling operations, most of the construction activity and storage of equipment will be adjacent to shaft locations.

During our sewer line construction work (Mon.-Sat, 8:30 a.m. - 6:00 p.m.) along Wanaao Road, we intend to maintain a minimum of one lane open at all times with two-way traffic being maintained using 2 off-duty police officers to direct vehicles thru the work zone. Two lanes will be open (one lane in each direction) Mon. - Fri, between 4:00-6:00 p.m. and during all non-work hours. On-street parking will be prohibited in the vicinity of our microtunneling shafts and areas of open trench work. During the construction period on Wanaao Road, our traffic control plans will try to encourage motorists wishing to travel northbound on Wanaao Rd. to use Hamakua Drive. Signs will be placed at the entrance to Wanaao Rd. at the Keolu Dr. intersection and two other locations that will say: "Wanaao Road. Sewer Line Construction. Use Alternate Route - Hamakua Dr. (w/arrowhead)". For southbound traffic on Wanaao Rd. we will consider posting similar signs at the Kailua Rd./Wanaao Rd. intersection that would encourage traffic to be detoured to Hamakua Drive via Hahani St. It is anticipated to take approximately one year to complete the sewer line construction work along Wanaao Rd.

Regarding Palawiki St., we realize this is a narrow, low capacity residential street and will not have any signage to detour traffic onto it.

We hope this addresses many of your concerns. If you have any questions about this project or wish to review our preliminary traffic control plans, please contact me at 527-5829.

Glenn Okita  
C&C, Project Engineer

To whom it may concern,

Thank you for providing your e-mail addresses for this purpose.

I am a mother of twin 3 1/2 year olds on Palawiki st. They are just

learning to ride their bikes and love to take walks around the block. We

already have people who drive too fast down our street as it is and I just

dread the thought of getting more traffic down our street. We have many

cars who park on the street on this block and so many children you can not

count. We picked this neighborhood because it was not on a main drag and

there are lots of children to play with. Please help protect our children,

I am so afraid someone is going to be hurt due to this if it happens.

Papalani street does not have nearly as many children that live on it and

could handle more cars much more easily than Palawiki St. could. It is wider and less children as I mentioned before. If you end up using Palawiki, please, please, at least put in speed bumps. I don't have any other suggestions, I am just terribly worried about my babies and all their friends.

Thank you,

Tricia Komae

Hi, I live on Palawiki St. and am concerned about one of the traffic control options being considered for the upcoming sewer project.

I strongly encourage the Project Manager, Councilwoman Marshall, and the Neighborhood Board Members to reject any plans to divert Wanaao traffic down Palawiki Street.

Palawiki street is blessed with 27 kids under the age of 13 (with more coming!) - and every weekday afternoon and weekend the kids are out playing and riding bikes up and down the street. Additional traffic would create a very real concern for the safety of the kids on the street - including my 5 year old and 3 year old.

In addition to the safety risk - there are some other problems with routing traffic down Palawiki. The street is standard width - much narrower than Wanaao and Papalani - and people park on both sides of the road. At all times of the day and night the street-side parking limits traffic to essentially a single-lane situation where cars must wait for each other to pass through. This situation will become even more acute once on-street parking on Wanaao is limited when the project begins - a good number of those cars will now be forced to park on surrounding streets including Palawiki and Papalani.

Though it is not an incredibly attractive option - routing overflow



traffic on Papalani street is at least feasible given the width of the street and the fact that Papalani is already much more heavily traveled than Palawiki.

I certainly realize the importance of the project and trust that the project management team will make prudent decisions to minimize the impact to through-traffic and the impacted local taxpayers.

Thank you very much for your consideration.

Best regards,

Kristen Lemonds

**Aloha Councilwoman Marshall, Kailua Neighborhood Board Members and Project Manager:**

I understand one option under consideration is to divert northbound traffic from Keolu / Wanaao on to Palawiki Street. While I agree this route may initially seem to be a good idea given Palawiki Street's proximity to the main intersection, I believe rerouting both northbound and southbound traffic down Papalani Street is a safer alternative.

Palawiki Street is home to many families with young children that ride bicycles and skateboards, play in front yards and dart across the street to neighbor's homes. I believe this street is home to the largest number of children in the immediate area and fear any increase in traffic will put these children at great risk.

I presume there is a car count as to traffic volume on Wanaao Road and that these figures will support the notion that Palawiki Street is too narrow to accommodate the increase in traffic. Our street is often reduced to a single lane under current local traffic; a situation that could become extremely dangerous especially when increased volume is coupled with motorists traveling at speeds above 15 mph.

I suggest Wanaao be kept open for local residents and emergency vehicles and rerouting all traffic down Papalani. A blinking or regular traffic light at Papalani and Keolu could be installed to identify and control traffic at the new main intersection.

Installing a speed bump on Papalani may help mitigate motorists tempted to speed.

Another alternative is to close Wanaao at Kailua Road and Wanaao at Keolu [open only to local traffic and emergency vehicles] and reroute traffic to Enchanted Lakes through town [Hahani - Hamakua - Keolu]. This, however, may exacerbate existing traffic in the area and may depend on whether work on the Hamakua project has been completed.

I appreciate the need for the project and want to thank you for allowing area residents to comment and address their concerns about traffic flow during construction. I trust you will keep the safety of our keiki in mind when finalizing the plans.

Aloha,

Kathleen Meier  
629 Palawiki Street  
Kailua, HI 96734  
808.263.0144

Dear government officials,

We live on Palawiki St. and are concerned about the traffic control options

being considered for the upcoming sewer project on Wanaao.

We strongly encourage the Project Manager, Councilwoman Marshall, and the Neighborhood Board Members to reject any plans to divert Wanaao traffic down Palawiki Street.

Palawiki street has with 27 kids under the age of 13. Since Hawaii was ranked #1 in pedestrian deaths, diverting any traffic down Palawiki St is a fatality waiting to happen. Palawiki St is standard width and people park on both sides of the street, which is much .

narrower than Wanaao and Papalani. Palawiki St is essentially a single-lane situation where cars must

*wait for each other to pass through. This situation will become worse once on-street parking on Wanaao is limited when the project begins - a good number of those cars will now be forced to park on surrounding streets including Palawiki and Papalani.*

Though it is not an incredibly attractive option - routing overflow traffic on Papalani street is at least feasible given the width of the street and the fact that Papalani is already much more heavily traveled than Palawiki.

Another option is to close Wanaao completely except for local traffic and re-route traffic into town. Since the micro-tunneling process seems to take about 3 years per mile, (using Kalaheo as an example) Please think carefully before sending any more traffic down Palawiki St.

We certainly realize the importance of the project and trust that the project management team will make prudent decisions to minimize the impact to through-traffic and the impacted local taxpayers.

Thank you very much for your consideration.

Mahalo

Doug Borton & Family

(Kids 3 & 1 yr old )

**Appendix A**  
**PRE-ASSESSMENT CONSULTATION**



**Sato & Associates, Inc.**

**Consulting Engineers**

2046 S. King Street, Honolulu, Hawaii 96826  
OFFICES IN HONOLULU AND MAUI

Tel: (808) 955-4441  
Fax: (808) 942-2027

17 November 2000

Gentlemen;

The City and County of Honolulu Department of Design and Construction Division of Planning and Programming is planning to replace an existing sewer line within Kailua on the island of Oahu. The project is named "Wanaao Road Replacement Sewer." The proposed project involves replacement of sewer lines below Keolu Drive and Wanaao Road. Please refer to the attached maps.

The need for the sewer line rehabilitation was first identified in an August 1995 preliminary engineering report for the Kalaheo Avenue Relief Sewer. A Wanaao Road Sewer Study was initiated after four wet weather spills in 1998. A field investigation, which examined the existing sewer system along Keolu Drive and Wanaao Road, was conducted in February 2000. The reports indicate that this portion of the sewer line has deteriorated and needs to be replaced.

The project site is comprised of residential subdivision with single-family homes, neighborhood businesses, and a school. The sewer line is located primarily in Keolu Drive and Wanaao Road which are main roads for the area. The sewer line crosses under two streams that run through the community.

We are currently preparing a Draft Environmental Assessment (DEA) for the project. This letter serves as a pre-consultation letter to residents, businesses, governmental agencies and representatives, community groups, and utility companies regarding this project.

Please inform us in writing if you have any substantive comments regarding this project. This will allow us to incorporate your comments into the DEA. Please forward your comments to us by 15 December 2000.

Your assistance will be appreciated. Should you have any questions, please do not hesitate to contact us.

Very truly yours,

SATO & ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read 'Loren G.S. Lau', is written over the typed name.

Loren G.S. Lau, AIA  
Project Manager



Sato & Associates, Inc.

Consulting Engineers

2046 S. King Street, Honolulu, Hawaii 96826  
OFFICES IN HONOLULU AND MAUI

Tel: (808) 955-4441  
Fax: (808) 942-2027

17 November 2000

Dear Resident;

The City and County of Honolulu Department of Design and Construction Division of Planning and Programming is planning to replace an existing sewer line within Kailua on the island of Oahu. The project is named "Wanaao Road Replacement Sewer." The proposed project involves replacement of sewer lines below Keolu Drive and Wanaao Road. Please refer to the attached maps.

The need for the sewer line rehabilitation was first identified in an August 1995 preliminary engineering report for the Kalaheo Avenue Relief Sewer. A Wanaao Road Sewer Study was initiated after four wet weather spills in 1998. A field investigation, which examined the existing sewer system along Keolu Drive and Wanaao Road, was conducted in February 2000. The reports indicate that this portion of the sewer line has deteriorated and needs to be replaced.

The project site is comprised of residential subdivision with single-family homes, neighborhood businesses, and a school. The sewer line is located primarily in Keolu Drive and Wanaao Road which are main roads for the area. The sewer line crosses under two streams that run through the community.

We are currently preparing a Draft Environmental Assessment (DEA) for the project. This letter serves as a pre-consultation letter to residents, businesses, governmental agencies and representatives, community groups, and utility companies regarding this project.

Please inform us in writing if you have any substantive comments regarding this project. This will allow us to incorporate your comments into the DEA. Please forward your comments to us by 15 December 2000. Your assistance will be appreciated. Should you have any questions, please do not hesitate to contact us.

Very truly yours,

SATO & ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read 'Loren G.S. Lau'.

Loren G.S. Lau, AIA  
Project Manager

94066-00

RS  
LL



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

REPLY TO  
ATTENTION OF

November 22, 2000

Regulatory Branch


Mr. Loren G.S. Lau, AIA  
Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, Hawaii 96826

Dear Mr. Lau:

This letter responds to your request for comments on the Wanaao Road Replacement Sewer project, dated November 17, 2000. Based on the information you provided I have determined that a Department of the Army (DA) permit will likely be required for the stream crossings which are part of this project.

If you have any questions concerning this determination, please contact William Lennan of my staff at 438-6986 or FAX 438-4060, and reference File No. 200100055.

Sincerely,

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

RECEIVED  
NOV 27 2000  
SATO & ASSOC., INC.



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pacific Islands Ecoregion  
300 Ala Moana Boulevard, Room 3-122  
Box 50088  
Honolulu, Hawaii 96850

94066-00

LL

JUL - 2 2001

In Reply Refer To: CMH

Loren G. S. Lau, AIA  
Project Manager  
Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, Hawaii 96826

Re: Request for Species List for Wanaao Road Replacement Sewer

Dear Ms. Lau:

On May 30, 2001, the U.S. Fish and Wildlife Service (Service) received your facsimile requesting information on listed species to aid in the development of environmental documents for the City and County of Honolulu. The proposed action involves the replacement of an existing sewer line within Keolu Drive and Wanaao Road in Kailua on the island of Oahu.

We have reviewed information contained in your facsimile and in our files, including maps prepared by the Hawaii Natural Heritage Program and the Service's National Wetlands Inventory Program. To the best of our knowledge, the following federally listed species may occur in the project area:

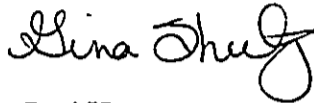
<u>Common Name</u>	<u>Hawaiian Name</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Hawaiian duck	koloa maoli	<i>Anas wyvilliana</i>	endangered
Hawaiian coot	alae ke'oke'o	<i>Fulica alai</i>	endangered
Hawaiian moorhen	'alae 'ula	<i>Gallinula chloropus sandvicensis</i>	endangered
Hawaiian stilt	ae'o	<i>Himantopus mexicanus knudseni</i>	endangered

In addition to these listed species, there have been historical observations of the Hawaiian owl or pueo (*Asio flammeus*), a species of concern, in the area.

With regard to your question as to whether flora or fauna surveys are required, it is up to the action agency to determine if surveys are warranted. If there is any possibility that the proposed action may affect listed species, the Service recommends surveys be conducted.

We appreciate the opportunity to provide comments on the proposed project. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Colleen Henson by phone at (808) 541-3441.

Sincerely,



Paul Henson  
Field Supervisor

*acting*



BENJAMIN J. CAYETANO  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
P.O. BOX 2360  
HONOLULU, HAWAII 96804

44066-00  
RS  
LL  
PAUL G. LeMAHIEU, Ph.D.  
SUPERINTENDENT

OFFICE OF THE SUPERINTENDENT

December 7, 2000

Mr. Loren G.S. Lau, AIA  
Project Manager  
Sato & Associates, Inc.  
2046 King Street  
Honolulu, Hawaii 96826

Dear Mr. Lau:

Subject: Wanao Road Replacement Sewer Pre-Consultation

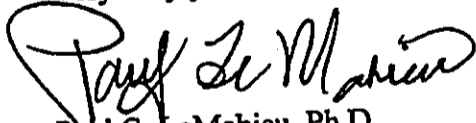
Since the proposed project is in close proximity to Enchanted Lake Elementary School, we request that notice be given directly to the school prior to the start of construction. The advance notice will allow the school to prepare for any disruption to its traffic flow.

The notice should be sent to:

Principal  
Enchanted Lake Elementary School  
770 Keolu Drive  
Kailua, Hawaii 96734

Thank you for the opportunity to comment. If you have any questions, please call Mr. Sanford Beppu at 733-4862.

Very truly yours,

  
Paul G. LeMahieu, Ph.D.  
Superintendent of Education

PLeM:hy

cc: P. Yoshioka, DAS  
Principal, Enchanted Lake Elementary

RECEIVED  
DEC 20 2000  
SATO & ASSOC., INC.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

BENJAMIN J. CAYetano  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
Kakuhikawa Building, Room 555  
601 Kamohala Boulevard  
Kapolei, Hawaii 96707

99066-00 DM  
TIMOTHY E. JOHNS, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
DEPUTIES  
JANET E. KAWALO JN

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

May 30, 2000

Jason Y. Nishikawa  
Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, Hawaii 96826

RECEIVED  
MAY - 9 2000

SATO & ASSOC., INC.

LOG NO: 25511 ✓  
DOC NO: 0005EJ29

Dear Mr. Nishikawa:

**SUBJECT: Chapter 6E-8 Historic Preservation Review – Wanaao Road Replacement  
Sewer  
Kailua, Ko`olaupoko, O`ahu  
TMK: 4-2**

Thank you for the opportunity to comment on the proposed Wanaao Road Replacement Sewer project. The project proposes rehabilitating/replacing the existing sewer main located along Wanaao Road and Keolu Drive. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas. We received notification of this undertaking through U. S. mail on April 11, 2000, and we apologize for the delay in our response.

The sewerline replacement will be done with "trenchless" construction method (cured in place, slip lining, pipe bursting, fold in form pipe, etc) unless it has been determined that the pipes need to be replaced. In that case, open trench construction methods may be applied. If a new pipe is to be installed the new sewerline will run adjacent to the existing line.

Excavation will be conducted under existing roadways. Archaeological surveys have not been conducted previously along the length of the proposed reconstructed sewer project, however, based on historical and archaeological information from similar areas within Kailua, it is likely that significant historic sites will be found during ground disturbing activities within underlying sediments in some portions of the project area. These deposits are identified as beach sands which are known to contain human burials and other cultural deposits associated with traditional Hawaiian use of the area. The remaining portion of the corridor is classified as fill soils (Keolu Drive and portions of Wanaao Road) and it is not likely to contain historic sites.

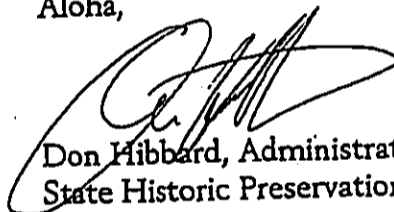
Jason Y. Nishikawa  
Page Two

SHPD believes that significant historic sites present along portions of the corridor underlain by sand deposits will be adversely affected by this project. In order to counter any inadvertent adverse effect on significant historic sites, we recommend that a written archeological monitoring plan be submitted to this office for review and acceptance prior to any ground disturbance. An archaeological monitoring plan must contain the following eight specifications:

1) The kinds of remains that are anticipated; 2) Where in the construction area the remains are likely to be found; 3) How the expected types of remains will be treated, if found; 4) The archaeologist conducting the monitoring has the authority to halt construction in the immediate area of a find in order to carry out the plan; 5) A coordination meeting between the archaeologist and construction crew is scheduled, so that the construction team is aware of the plan; 6) What laboratory work will be done on remains that are collected; 7) A schedule for report preparation; and 8) Details concerning the archiving of any collections that are made. In addition, please include maps showing the location(s) of the proposed undertakings.

If you have any questions please call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,



Don Hibbard, Administrator  
State Historic Preservation Division

EJ:jk

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII



776.66-00  
TIMOTHY E. JOHNS, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES  
JANET E. KAWALO  
LINNELL NISHIOKA

KS  
LL

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
Kakuhihewa Building, Room 555  
601 Kamokila Boulevard  
Kapolei, Hawaii 96707

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

November 29, 2000

Loren G. S. Lau, AIA  
Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, Hawaii 96826

RECEIVED  
DEC - 4 2000

SATO & ASSOC., INC.

LOG NO: 26604 ✓  
DOC NO: 0011EJ19

Dear Mr. Lau:

**SUBJECT: Chapter 6E-8 Historic Preservation Review - Wanaao Road Replacement  
Sewer  
Kailua, Ko`olaupoko, O`ahu  
TMK: 4-2**

We commented In May 2000 during the planning stages for this project(SHPD Log No: 25511, May 30, 2000). Our earlier comments are included below in full.

Thank you for the opportunity to comment on the proposed Wanaao Road Replacement Sewer project. The project proposes rehabilitating/replacing the existing sewer main located along Wanaao Road and Keolu Drive. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas.

The sewer line replacement will be done with "trenchless" construction method (cured in place, slip lining, pipe bursting, fold in form pipe, etc.) unless it has been determined that the pipes need to be replaced. In that case, open trench construction methods may be applied. If a new pipe is to be installed the new sewer line will run adjacent to the existing line.

Excavation will be conducted under existing roadways. Archaeological surveys have not been conducted previously along the length of the proposed reconstructed sewer project, however, based on historical and archaeological information from similar areas within Kailua, it is likely that significant historic sites will be found during ground disturbing activities within underlying sediments in some portions of the project area. These deposits are identified as beach sands which are known to contain human burials and other cultural deposits associated with traditional Hawaiian use of the area. The remaining portion of the corridor is classified as fill soils (Keolu Drive and portions of Wanaao Road) and it is not likely to contain historic sites.

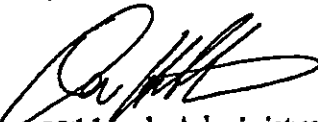
Loren G. S. Lau, AIA  
Page Two

SHPD believes that significant historic sites present along portions of the corridor underlain by sand deposits will be adversely affected by this project. In order to counter any inadvertent adverse effect on significant historic sites, we recommend that a written archeological monitoring plan be submitted to this office for review and acceptance prior to any ground disturbance. An archaeological monitoring plan must contain the following eight specifications:

1) The kinds of remains that are anticipated; 2) Where in the construction area the remains are likely to be found; 3) How the expected types of remains will be treated, if found; 4) The archaeologist conducting the monitoring has the authority to halt construction in the immediate area of a find in order to carry out the plan; 5) A coordination meeting between the archaeologist and construction crew is scheduled, so that the construction team is aware of the plan; 6) What laboratory work will be done on remains that are collected; 7) A schedule for report preparation; and 8) Details concerning the archiving of any collections that are made. In addition, please include maps showing the location(s) of the proposed undertakings.

Therefore, if an acceptable archaeological monitoring plan is implemented, we believe that the proposed sewer line replacement will have "no adverse effect" on significant historic sites. At this time, we have no cause to change our earlier comments; should new and substantive information become available please provide it to our office. If you have any questions please call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

  
Don Hibbard, Administrator  
State Historic Preservation Division

EJ:jk

**BOARD OF WATER SUPPLY**

CITY AND COUNTY OF HONOLULU  
630 SOUTH BERETANIA STREET  
HONOLULU, HAWAII 96843



November 30, 2000

94066-00

RS  
LL

JEREMY HARRIS, Mayor  
EDDIE FLORES, JR., Chairman  
CHARLES A. STED, Vice Chairman  
JAN M.L.Y. AMII  
HERBERT S.K. KAOPUA, SR.  
BARBARA KIM STANTON  
  
KAZU HAYASHIDA, Ex-Officio  
ROSS S. SASAMURA, Ex-Officio  
  
CLIFFORD S. JAMILE  
Manager and Chief Engineer

Mr. Loren G. S. Lau, AIA  
Richard Sato and Associates, Inc.  
2046 South King Street  
Honolulu, Hawaii 96826

Dear Mr. Lau:

**Subject: Your Transmittal of November 17, 2000 Requesting Pre-Consultation Comments on the Wanaao Road Replacement Sewer Project Draft Environmental Assessment**


Thank you for the opportunity to comment on the proposed sewer replacement project.

We have the following comments to offer:

1. The location of existing Board of Water Supply (BWS) waterlines should be indicated on the construction plans and addressed in the Draft Environmental Assessment (EA) to ensure the protection and integrity of our water system. The enclosed maps indicate our existing waterlines in the proposed project area.
2. The Draft EA and construction plans should be submitted for our review.
3. If water is required during construction, all connections to the BWS system will require BWS approved reduced pressure principle backflow prevention assemblies.

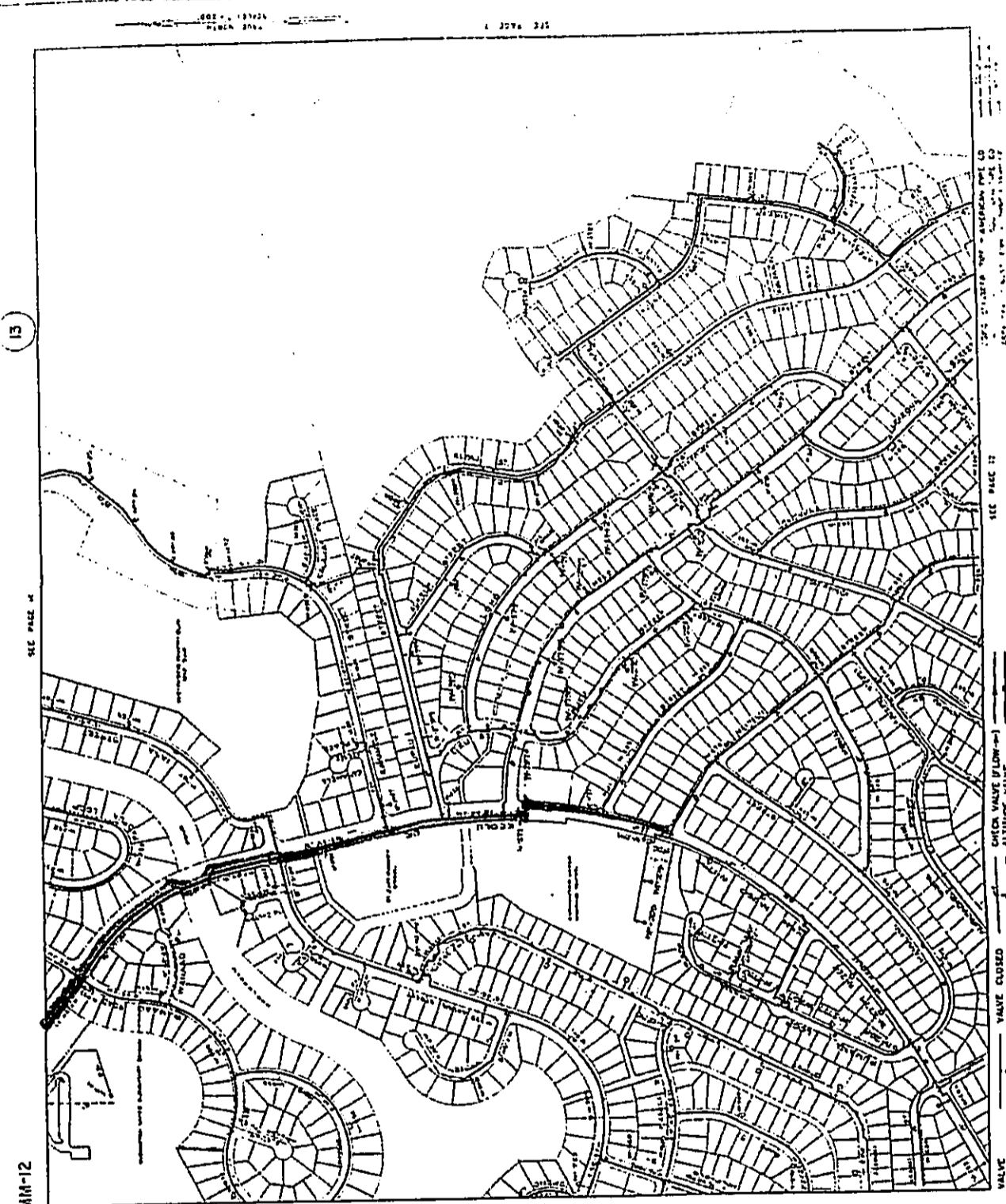
If you have any questions, please contact Scot Muraoka at 527-5221.

Very truly yours,

  
CLIFFORD S. JAMILE  
Manager and Chief Engineer

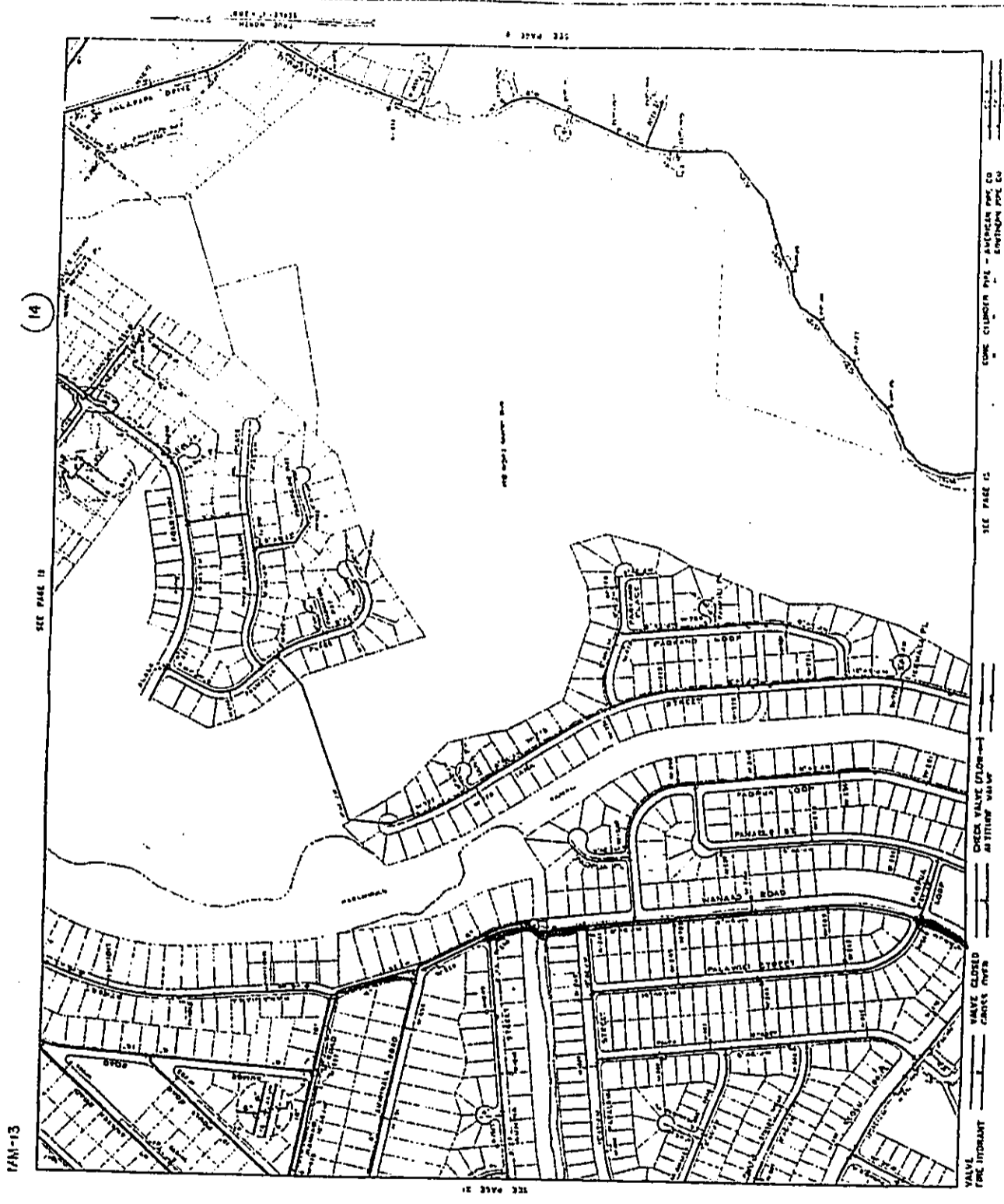
Enclosures

RECEIVED  
DEC - 5 2000  
SATO & ASSOC., INC.



NO.	NAME	TYPE	DATE	REMARKS
1	...	...	...	...
2	...	...	...	...
3	...	...	...	...
4	...	...	...	...
5	...	...	...	...
6	...	...	...	...
7	...	...	...	...
8	...	...	...	...
9	...	...	...	...
10	...	...	...	...
11	...	...	...	...
12	...	...	...	...
13	...	...	...	...
14	...	...	...	...
15	...	...	...	...
16	...	...	...	...
17	...	...	...	...
18	...	...	...	...
19	...	...	...	...
20	...	...	...	...
21	...	...	...	...
22	...	...	...	...
23	...	...	...	...
24	...	...	...	...
25	...	...	...	...
26	...	...	...	...
27	...	...	...	...
28	...	...	...	...
29	...	...	...	...
30	...	...	...	...
31	...	...	...	...
32	...	...	...	...
33	...	...	...	...
34	...	...	...	...
35	...	...	...	...
36	...	...	...	...
37	...	...	...	...
38	...	...	...	...
39	...	...	...	...
40	...	...	...	...
41	...	...	...	...
42	...	...	...	...
43	...	...	...	...
44	...	...	...	...
45	...	...	...	...
46	...	...	...	...
47	...	...	...	...
48	...	...	...	...
49	...	...	...	...
50	...	...	...	...

MM-12  
 SEE PAGE 14  
 SEE PAGE 12  
 VALVE  
 CLOSED VALVE  
 FIRE HYDRANT  
 AIR VALVE  
 CHECK VALVE  
 ALTIITUDE VALVE



NO.	DESCRIPTION	DATE	BY	CHECKED	APPROVED
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					





99066-00

RS  
LL

DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET • HONOLULU, HAWAII 96813  
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743 • INTERNET: www.co.honolulu.hi.us



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR

LORETTA K.C. CHEE  
DEPUTY DIRECTOR

2000/CLOG-6083 (RY)

December 22, 2000

Mr. Loren G. S. Lau, AIA  
Sato & Associates, Inc.  
2046 South King Street  
Honolulu, Hawaii 96826

RECEIVED  
DEC 26 2000  
SATO & ASSOC., INC.

Dear Mr. Lau:

Wanaao Road Replacement Sewer  
Kailua, Oahu, Hawaii

Thank you for the opportunity to provide pre-consultation comments for your preparation of a draft environmental assessment. Our comments primarily address permitting requirements and are as follows:


1. Permits to excavate the City right-of-way will be required. If ground water is encountered, a City dewatering permit will be required if effluent is discharged into the City storm drain system.
2. Best Management Practices must be implemented during the trench operations.
3. Sewage flow is over the design capacity of a portion of the existing sewer line (see attached map). Therefore, it is recommended that the new sewer line have a higher flow capacity than the existing sewer line to accommodate the larger flows.
4. Construction plans for all work within or affecting the City's road right-of-way must be submitted for review and comment. The plans should include the type and location of all traffic signs and pavement markings within the affected area. Traffic control plans during construction must also be submitted, as required.
5. The proposed replacement appears to be consistent with Section 4.3 of the Koolaupoko Sustainable Communities Plan (SCP) which calls for measures to improve the wastewater collection system by replacing deteriorated sewer lines. Projects such as these are ranked as "Priority One" under Section 5.2.1., Public Improvement Priorities, of the SCP.

Mr. Loren G. S. Lau, AIA  
Sato & Associates, Inc.  
Page 2  
December 22, 2000

However, Section 4.3.1 of the SCP also calls for "...adding storage capacity for wet-weather flows." Please address whether the proposed replacement sewer will address wet-weather flows.

Thank you for the opportunity to comment. If you have any questions, please contact Raymond Young of our staff at 527-5839.

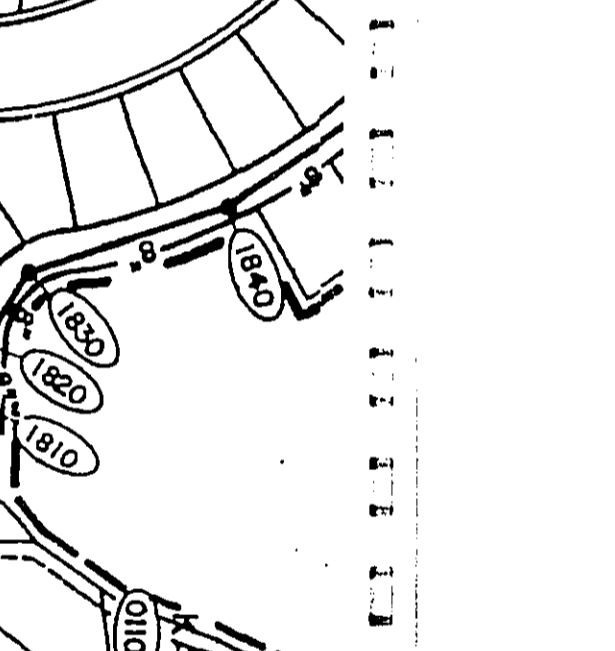
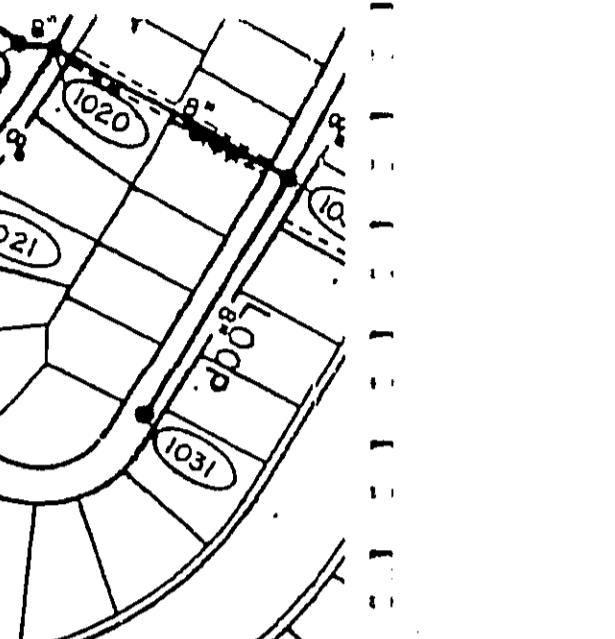
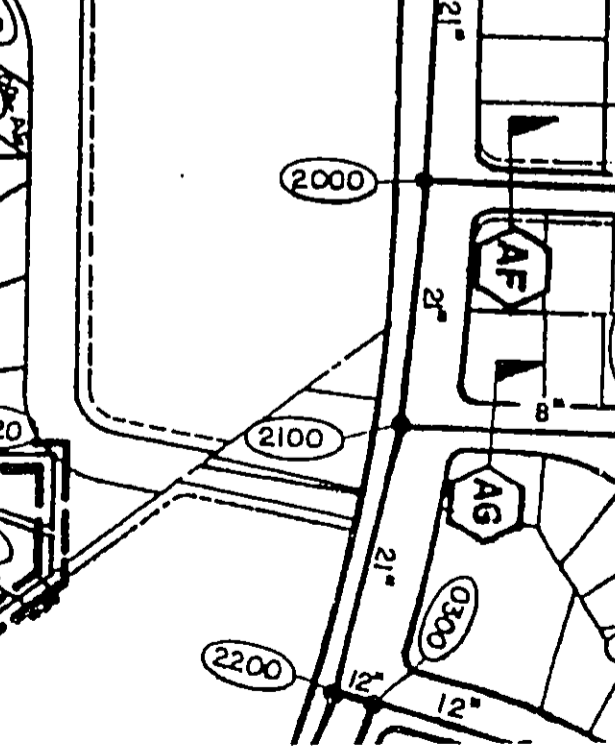
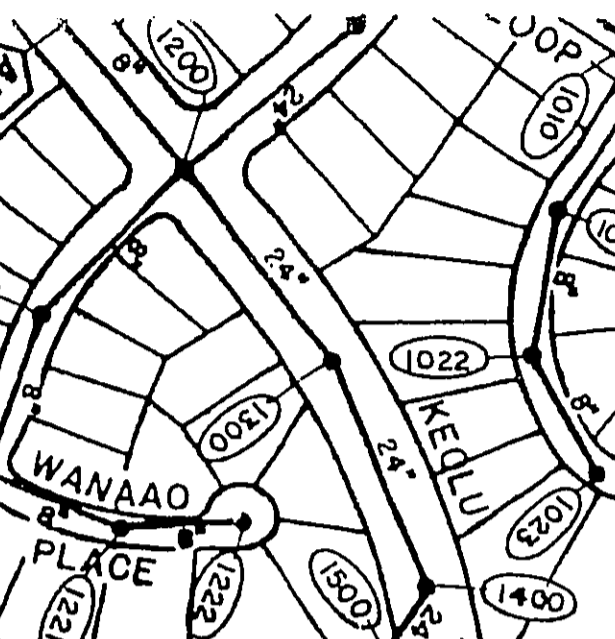
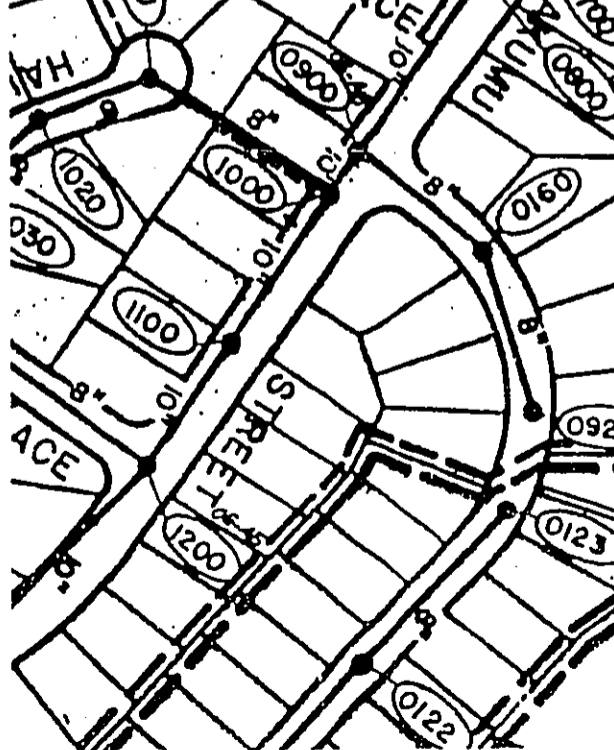
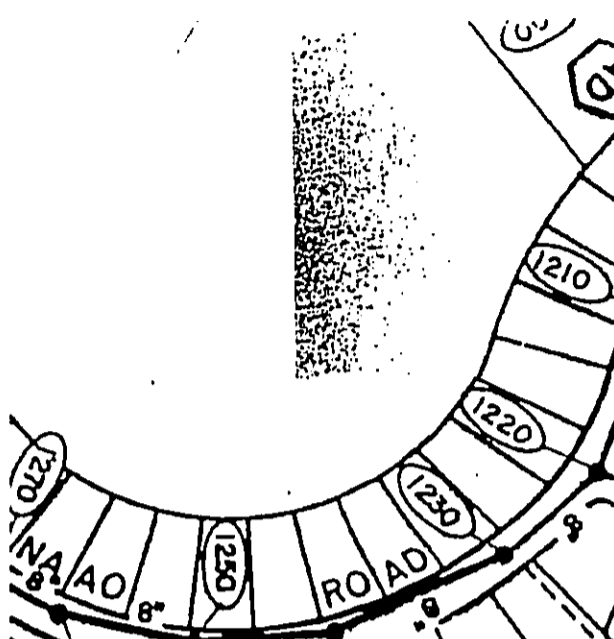
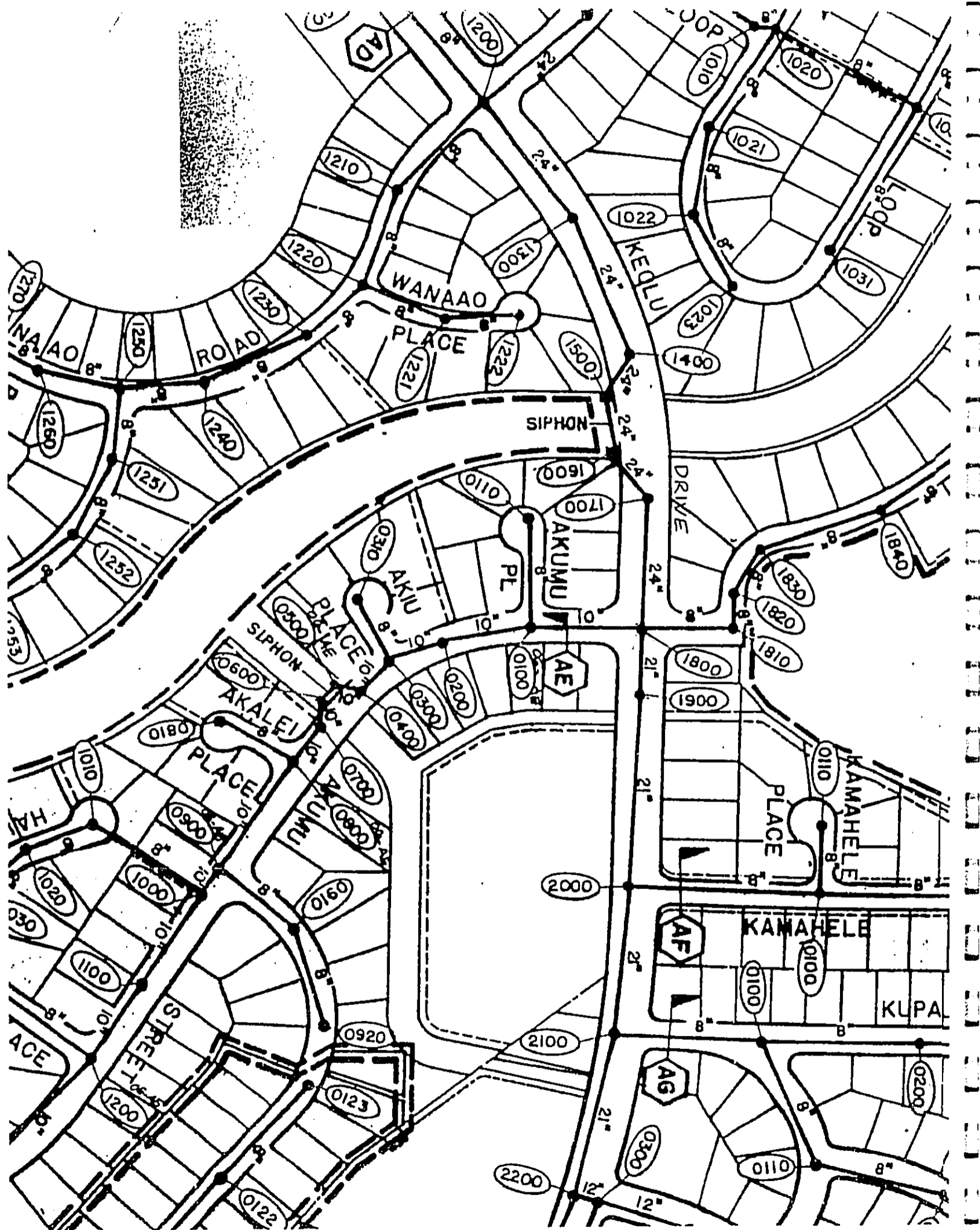
Sincerely yours,

  
RANDALL K. FUJIKI, AIA  
Director of Planning and Permitting

RKF:lh

Attachment  
68599



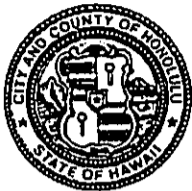


DEPARTMENT OF TRANSPORTATION SERVICES  
**CITY AND COUNTY OF HONOLULU**

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813  
PHONE: (808) 523-4529 • FAX: (808) 523-4730

RS  
LL

JEREMY HARRIS  
MAYOR



CHERYL D. SOON  
DIRECTOR

JOSEPH M. MAGALDI, JR.  
DEPUTY DIRECTOR

December 18, 2000

TPD11/00-05604R

Mr. Loren G.S. Lau, AIA  
Project Manager  
Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, Hawaii 96826

RECEIVED  
DEC 22 2000  
SATO & ASSOC., INC.

Dear Mr. Lau:

Subject: Wanaao Road Replacement Sewer

In response to your November 17, 2000 letter, the project information provided was reviewed. The following comments are the result of this review:

1. It appears that the subject project would have an impact on area residents for the duration of the project. In view of this, the area neighborhood board, residents, and businesses should be informed of the expected duration of work and the inconveniences (e.g., lane closures, temporary closure/relocation of bus stops, etc.) that can be expected. Planned mitigative measures should be detailed in the draft environmental assessment.
2. Both Keolu Drive (80' R.O.W.) and Wanaao Road (60' R.O.W.) have wide right-of-ways. Construction work should be planned whereby these roadways are open to traffic at all times. If lane closures and detours are required, mitigative measures, including obtaining support from the area neighborhood board and residents/businesses, informing emergency and bus personnel, publishing a "Notice to Motorists", and providing acceptable detour route plans, should be clearly outlined.
3. The City bus service operates on the portions of Wanaao Road and Keolu Drive in the project area. Bus service will be affected by the construction, potentially causing delays and temporary closure/relocation of bus stops. As previously stated, affected residents and businesses should be notified of these impacts. Construction plans should include the standard bus note regarding notifying Oahu Transit Services, Inc. two weeks prior to construction, informing them of the location, scope of work, proposed closure of any street or traffic lanes, and the need to relocate any bus stops.

Mr. Loren G. S. Lau, AIA  
December 18, 2000  
Page 2

Should you have any questions regarding these comments, please contact Faith Miyamoto of the  
Transportation Planning Division at 527-6976.

Sincerely,

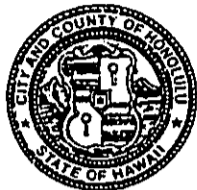


CHERYL D. SOON  
Director

99066-00 RS LL

FIRE DEPARTMENT  
**CITY AND COUNTY OF HONOLULU**

3375 KOAPAKA STREET, SUITE H425 • HONOLULU, HAWAII 96819-1869  
TELEPHONE: (808) 831-7761 • FAX: (808) 831-7750 • INTERNET: www.co.honolulu.hi.us



JEREMY HARRIS  
MAYOR

ATTILIO K. LEONARDI  
FIRE CHIEF

JOHN CLARK  
DEPUTY FIRE CHIEF

December 1, 2000

Mr. Loren G. S. Lau, AIA, Project Manager  
Sato & Associates, Inc.  
2046 South King Street  
Honolulu, Hawaii 96826

Dear Mr. Lau:

Subject: Pre-Consultation Letter for "Wanaao Road Replacement Sewer"

We received your letter dated November 17, 2000, regarding the above-mentioned project.

The Honolulu Fire Department requests that you comply with the following:

1. Maintain fire apparatus access throughout the construction site for the duration of the project.
2. Notify the Fire Communication Center (523-4411) of any interruption in the existing fire hydrant system during the project.

Should you have any questions, please call Battalion Chief Kenneth Silva of our Fire Prevention Bureau at 831-7778.

Sincerely,

Handwritten signature of Attilio K. Leonard in cursive.

ATTILIO K. LEONARDI  
Fire Chief

AKL/KS:ms

RECEIVED  
DEC - 7 2000

SATO & ASSOC., INC.

77066 LL

RS  
LL

December 18, 2000



Mr. Loren Lau  
Sato & Associates, Inc.  
2046 S. King St.  
Honolulu, Hawaii 96826

RECEIVED

DEC 20 2000

SATO & ASSOC., INC.

Dear Mr. Lau:

**Re: Wanao Road Sewer Replacement  
Wanao Rd. and Keolu Dr.  
HECO Work Order No: CE016753**

This is in response to your letter of November 17, 2000 regarding the subject project. We have reviewed your proposed project and are returning our comments.

HECO currently has overhead 46kV lines and overhead and underground 12kV and secondary lines in the vicinity of the proposed project. Please refer to HECO's "as-built" drawings that were provided to Control Point Surveying, Inc. on February 11, 2000 for the approximate locations of HECO's underground electrical facilities in the area of your project. Design of this proposed project should take into account the location of all HECO's existing facilities and avoid any conflicts with these facilities. For guidance, please refer to the attached revised HECO standard notes when working near HECO's facilities.

Should you choose to go forward with plans for construction, we request that you include with sufficient accuracy all of the information on HECO's overhead and underground facilities on your plans (to include our underground profile) and provide us with two sets of your pre-final drawings.

Please note that there may be costs associated with any relocation work by HECO that may be borne by the requestor, and that any redesign or relocation of HECO's facilities may be cause for lengthy delays. For example, any work performed by HECO in excess of \$500,000 will require approval by the Public Utilities Commission (PUC). HECO will not be able to order materials or start construction until PUC approval is received. This PUC approval process may range anywhere from three to nine months depending on the complexity of the work. In order to minimize any delay or impact on the project schedule, HECO shall be notified immediately upon determination that HECO's facilities will need to be relocated. HECO shall not be responsible for any delay or damage that may arise as a result of not being given sufficient notice to relocate its facilities.

In responding to this letter, please refer to the HECO request number shown above. If there are any questions, please contact me at 543-7785.

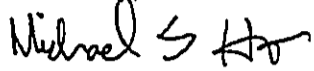
WINNER OF THE EDISON AWARD  
FOR DISTINGUISHED INDUSTRY LEADERSHIP





Wanaao Road Sewer Replacement  
HECO Work Order No.: CE016753  
December 18, 2000  
Page 2

Sincerely,



Michael S. Ho  
Lead Engineer  
Engineering Department

Attachment(s)



## HECO NOTES

### 1. Location of HECO Facilities

The location of HECO's overhead and underground facilities shown on the plans are from existing records with varying degrees of accuracy and are not guaranteed as shown. The Contractor shall verify in the field the locations of the facilities and shall exercise proper care in excavating and working in the area. The Contractor shall be responsible for any damages to HECO's facilities whether shown or not shown on the plans.

### 2. Compliance with Hawaii Occupational Safety and Health Laws

The Contractor shall comply with the State of Hawaii's Occupational Safety and Health laws and regulations, including without limitation, those related to working on or near exposed or energized electrical lines and equipment.

### 3. Excavation Permit

The Contractor shall obtain an excavation permit from HECO's Technical Division (543-5654) located at 820 Ward Avenue, 4<sup>th</sup> Floor, two weeks prior to starting construction. Please refer to our request number at that time.

### 4. Overhead Lines

State law requires that a worker and the longest object he or she may contact cannot come closer than a minimum *radial* clearance of 10 feet when working close to or under any overhead lines rated 50kV and below. For each additional 1kV above 50kV, an additional 0.4 inch shall be added to the 10-foot clearance requirement. The preceding information on line clearance requirements is provided as a convenience and it is the contractor's responsibility to be informed of and comply with any revisions or amendments to the law.

Should the Contractor anticipate that his work will result in the need to encroach within the minimum required clearance at any time, the Contractor shall notify HECO at least four (4) weeks prior to the planned encroachment so that, if feasible, the necessary protections (e.g. relocate, de-energize, or blanket HECO lines) can be put in place. HECO's cost of safeguarding its lines will be charged to the Contractor.

Contact HECO's Customer Installations Department at 543-7846 for assistance in identifying and safeguarding overhead power lines.

Refer to Section X of HECO's Electric Service Installation Manual for additional guidelines when working around HECO's facilities. A copy may be obtained from HECO's Customer Installations Department.

### 5. Pole Bracing

A minimum clearance of 10 feet must be maintained when excavating around utility poles and/or their anchor system to prevent weakening or pole support failure. Should work require excavating within 10 feet of a pole and/or its anchor system, the Contractor shall protect, support, secure, and take all other precautions to prevent damage to or leaning of these poles. The Contractor is responsible for all associated costs to brace, repair, or straighten poles. All means of structural support for the pole proposed by the Contractor shall first be reviewed by HECO before implementation. For pole bracing instructions, the Contractor shall call the HECO Construction

and Maintenance Dept., Customer & System Superintendent at 543-4223 a minimum of two (2) weeks in advance.

#### **6. Underground Lines**

The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of underground lines. HECO's existing electrical cables in the area are energized and will remain energized during construction. Only HECO personnel are to handle these cables and erect temporary guards to protect these cables from damage. The cost of HECO's assistance in providing proper support and protection of its underground lines will be charged to the Contractor. The contractor shall exercise due care and precautions to avoid disturbing any energized cables and temporary guards and shall work cautiously at all times to avoid accidents.

For verification of underground lines or for assistance in providing proper support and protection of these lines, the Contractor shall call HECO's Construction & Maintenance Dept., Customer & System Superintendent, at 543-4223, a minimum of two (2) weeks in advance.

#### **7. Excavations**

When trench excavation is adjacent to or beneath HECO's existing structures or facilities, the Contractor is responsible for:

- a) Sheeting and bracing the excavation to prevent slides, cave-ins, and settlements.
- b) Protecting existing structures or facilities with beams, struts, or under-pinnings.
- c) Backfilling with proper backfill material including special thermal backfill where existing (refer to Engineering Department for thermal backfill specifications).

#### **8. Relocation of HECO Facilities**

Any work required to relocate or modify HECO facilities shall be done by HECO, or by the Contractor under HECO's supervision. The Contractor shall be responsible for all coordination, and shall provide necessary support for HECO's work, which may include, but not be limited to, excavation and backfill, permits and traffic control, and restoration of pavement, sidewalks, and other facilities.

All costs associated with any relocation or modification (either temporary or permanent) for the convenience of the Contractor, or to enable the Contractor to perform his work in a safe and expeditious manner in fulfilling his contract obligations shall be borne by the Contractor.

#### **9. Conflicts**

The Contractor acknowledges that HECO is not responsible for any delay or damage that may arise as a result of any conflicts discovered or identified with respect to the location or construction of HECO's electrical facilities in the field, regardless of whether the Contractor has met the requested minimum advance notices. In order to minimize any delay or impact arising from such conflicts, the Contractor shall notify HECO immediately upon discovery or identification of such conflict.

#### **10. Damage to HECO facilities**

The Contractor shall be responsible for the protection of all HECO surface and subsurface utilities and shall be responsible for any damages to HECO's facilities as a result of his operations. The Contractor shall immediately report such damages to HECO's trouble dispatcher at 548-7961.

Repair work shall be done by HECO or by the Contractor under HECO's supervision. Costs for damages to HECO's facilities shall be borne by the Contractor.

**11. HECO Stand-By Personnel**

The Contractor may request HECO to provide an Inspector to stand-by during construction near HECO's facilities. The cost of such inspection will be charged to the Contractor.

The Contractor shall call the HECO Construction and Maintenance Dept., Customer & System Superintendent at 543-4223 a minimum of 5 working days in advance to arrange for HECO stand-by personnel.

**12. Indemnity**

The Contractor shall indemnify, defend and hold harmless HECO from and against all losses, damages, claims, and actions, including but not limited to reasonable attorney's fees and costs based upon or arising out of damage to property or injuries to persons, or other tortious acts caused or contributed to by Contractor or anyone acting under its direction or control or on its behalf; provided Contractor's indemnity shall not be applicable to any liability based upon the sole negligence of HECO.



99066-00



Verizon Hawaii Inc.  
P.O. Box 2200  
Honolulu, HI 96841

December 12, 2000

Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, Hawaii 96826

Attention: Loren G.S. Lau

Subject: Wanaao Road Replacement Sewer  
Kailua, Oahu, Hawaii

Thank you for the notification of the above subject project. Most of our facilities are aerial within the proposed project area. There could be a possible conflict near the intersection of Keolu Drive and Hui Street with our existing underground ductline. Please forward a set of the detail design plans for our review when they become available.

Should you have any questions, please call Ed Erickson at 840-5838.

Sincerely,

David Z. Hayashi  
for Wayne L. Cabral  
Manager - OSP Engineering-Hawaii

cc: K. Ayano  
File (Kailua C.O.)

RECEIVED  
DEC 14 2000  
SATO & ASSOC., INC.

99066-00

*+St. John Vianney Parish*

920 Keolu Drive, Kailua, Oahu, Hawaii 96734-3899 Telephone: (808) 262-8317 Fax: 261-4039

December 13, 2000

Mr. Loren G. S. Lau, AIA  
Sato & Associates, Consulting Engineers  
2046 S. King Street  
Honolulu, HI 96826

Dear Mr. Lau,

At a recent administrative staff meeting at St. John Vianney, the subject of the "Wanaao Road Replacement Sewer Project" was discussed. The following questions were asked:

1. How will this project affect the traffic flow on Keolu Drive, especially around our property and the Enchanted Lake Shopping Center?
2. Will the electrical power, the sewer system or the water service be disrupted at any time, and if so, will we be notified in advance of these outages?
3. What will the work hours be and the projected completion time of this project.?

Some of these questions may seem minor, but to continue our smooth operation here at St. John Vianney we need to know the answers to these questions. Thank you very much for soliciting our comments and questions for the proposed project.

Sincerely,

*Thomas L. Gross*

(Very Rev.) Thomas L. Gross  
Pastor

RECEIVED  
DEC 14 2000  
SATO & ASSOC, INC.

99066-00

LL

December 12, 2000.

Gentlemen:

This letter is regarding a project to replace a sewer line below Keolu Drive and Wanao Road in Kailua, indicated in a letter dated on November 17, 2000 from Sato & Associates, Inc.

As a business located in Enchanted Lake Shopping Center, we would like to know how long this project will take and how you would keep the traffic flow as smooth as possible, so we do not loose customers, especially during daytime.

Please inform us in writing about your plans after you received all comments from residents and businesses about this project. Thank you.

Sincerely,

Enchanted Lake L & L Inc.  
1020 Keolu Dr., C-6  
Kailua, HI 96734

Julio Luy  
President.

RECEIVED  
DEC 14 2000  
SATO & ASSOC., INC.

94056-60

13 DEC 00

W

Sato and Associates, Inc.  
2046 S. King Street  
Honolulu, HI 96826

Dear Associates:

Thank you for allowing us to comment on the upcoming sewer project on Wanaao Road.

Many questions have arisen after viewing the works on Kalaheo and Aumoe. Some of the questions and concerns are equipment parking, stowage of dirt, traffic routing and home access restrictions.

Residents living next to Triangle Park and other residents living in the area are currently deprived of the complete park usage, even after the work was finished on the Kalaheo Sewer Project several months ago. Also, there was no protection from the dust and noise and smelly dirt while the construction was in progress on Kailua Road and Aumoe Road.

So one of our concerns is where will the equipment be parked. The equipment that was used in the Kalaheo And Aumoe sewer work is still parked in Triangle Park and there is no work presently in progress. We believe this to be unfair to the residents in the area, of which I am one. Not only is it an eyesore with all the junk parked there but it also deprives the residents of park usage in some areas of the park. We believe that the equipment and dirt piles could be parked elsewhere such as in the quarry road area away from a residential neighborhood.

If the equipment and dirt piles are stored in a neighborhood at least there should be a large fence with screens to keep the dust and noise level away from the homes.

Other concerns are:

- when will work begin?
- Will access to our home on Wanaao Road be restricted during construction hours?
- How long will the project take?
- What time of day will work begin and end? Sometimes the work on the Kalaheo Project went into the evening and on weekends.

My wife and I appreciate the need for a new sewer line but we do hope you will have consideration for the residents in the area by providing some protection from dust, noise, smell and cosmetic appearance of the neighborhood. Everyone pays the same amount of taxes in the area so please do not favor one area over another because someone more influential may live on a certain street.

RECEIVED

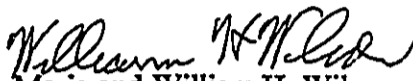
DEC 14 2000

SATU & ASSOC., INC.



Thank you for allowing us to submit our comments and for the courtesy of requesting us to submit comments about the Project.

Sincerely,

  
Maria and William H. Wilson  
570 Wanaao Road  
Kailua, HI 96734  
Tel: 262-7865

**Appendix B**  
**PUBLIC INFORMATION MEETING**  
**January 23, 2006**

**Notes of Public Briefing and Input Meeting  
Wanaao Road/Keolu Drive Reconstructed Sewer**

Monday, January 23, 2006, 6:00-8:00 pm  
St. John Vianney School, 920 Keolu Drive, Kailua

Sixteen members of the community attended the meeting, including residents and business owners.

**Purpose of the Meeting**

The meeting was convened by the Department of Design and Construction (DDC) to provide information about a sewer reconstruction project on Wanaao Road and Keolu Drive in Kailua that is scheduled to begin in 2007. Input from attendees is being considered in the preparation of an environmental assessment and environmental permits, specifically a request for a noise variance from the State Department of Health. Notice of the meeting was provided by flyers distributed to homes and businesses within a 500-foot radius of the project area.

Eldon Franklin, head of the City and County of Honolulu, Department of Design and Construction (DDC), Wastewater Division, provided a general introduction.

James Kwong of Yogi Kwong Engineers, a project consultant, presented a slideshow and detailed description of the project.

**Questions and Comments**

Questions and comments were taken during and after the presentation. Responses were provided by James Kwong, Eldon Franklin, and Glenn Okita, DDC project engineer.

**Question:** How does groundwater affect sewer lines?

**Response:** Groundwater (and storm water) is problematic when it enters the sewer system and adds to the total volume of wastewater flows. Groundwater can enter through cracked pipes and leaking manholes. In the Kailua area, wet weather conditions are estimated to increase flows in the sewer pipes up to five times the level of dry weather flows.

**Question:** Will the project correct the infiltration problem?

**Response:** The replacement line will be constructed with modern materials that are more corrosion resistant and in some cases, such as HDPE or high density polyethylene, do not have joints. The chances of infiltration will be reduced. You must still realize that the trunk line handles sewage from upland areas that will still experience infiltration, but the extreme flows will be reduced.

**Question:** Since the City is spending so much, why can't the sewer line be designed to handle storm water flows?

**Response:** The City's policy is to keep wastewater and storm water separate. It's expensive to collect, pump, and treat wastewater so we try to minimize the amount that's handled through the wastewater system.

**Question:** Why stop at Auwina Street? Why not connect to the new line being installed on Kalaheo Avenue?

**Response:** There is a force main from the pump station to Aumoe Road. A section on Kailua Road toward Kalaheo Avenue was replaced five years ago, so essentially the interval between the Kailua Heights Pump Station and Kalaheo Avenue has been completed.

**Question:** Once the project is completed, will there be sewage spills?

**Response:** By reducing the amount of excess water in the sewers, surcharging will decrease. Surcharging refers to the type of overloading that causes sewage to back up or overflow from manholes.

**Comment:** Please work with the Oahu Transit Service on bus routing. Buses that go through the project area carry relatively large numbers of passengers.

**Response:** There should be two through lanes through work areas with lanes wide enough for buses to pass. At times when only one lane is available, there will be contraflow operations with special duty officers or flagmen directing traffic. Formal detours onto side streets will be limited. OTS will be notified before work begins.

**Question:** Will the sewer work go beyond Wanaao Road on Keolu Drive?

**Response:** The line in that section was just CIPP'd—a rehabilitation process known as cured-in-place pipe—or replaced.

**Question:** What will be the duration of construction?

**Response:** Two years, possibly 2-1/2 years.

**Question:** When will construction actually start?

**Response:** The construction contract is scheduled to be awarded in March 2007. However, the contractor will need some time initially to mobilize and get approval of final plans and materials.

**Question:** When the original pipes were put in, did they do it improperly?

**Response:** The subdivision is located in an area with soft, marshy soils that were overlain with fill material. Over time, the subsurface material has compressed and differences in settlement have caused sags in the pipe. Sewer gas accumulating in the low spots causes corrosion. In turn, corroded sewer pipes allow groundwater or storm water to infiltrate, and can even collapse and produce sinkholes. These problems and potential problems are monitored through maintenance records and field tests, such as the smoke test.

**Question:** How much 24-hour bypass pumping will there be?

**Response:** That will depend on the contractor. Pumps will be turned on when the contractor needs to make a connection or in emergencies if the pipe collapses. In general, it takes 1-3 days to make a connection. To reduce noise levels, the contractor can erect noise reducing panels and use "quiet" generators.

**Question:** What will be the sequence of the project?

**Response:** In general, we try not to dictate a sequence to the contractor. It would be logical to start at the downstream end, so if there's a problem, the sewage can be dumped into completed sections of the new line. But ultimately the contractor will decide. Also, you might see the contractor do some sections out of sequence or see leapfrogging as the contractor moves ahead to do preparatory work, such as building shafts, jet-grouting to construct support piers, or relocating utilities.

**Question:** Will the City be replacing the feeder lines soon?

**Response:** There is a long-term plan to replace other trunk lines in the Kailua area. However, there are no plans currently to replace smaller lines on the hillsides. (Attendees could view a composite map showing CIP sewer projects in the region).

**Comment:** There are a lot of people in Waimanalo who go to the Enchanted Lake shopping area or travel through the subdivision to get to Kailua. I suggest contacting the Waimanalo Neighborhood Board.

**Response:** The Draft Environmental Assessment (DEA) will be sent to the Waimanalo Neighborhood Board and placed in the Waimanalo Public Library. The DEA will also be sent to elected officials representing Waimanalo.

**Comment:** Medians installed for traffic calming made traveling on the road hazardous.

**Question:** How many staging areas will be on Wanao Road and how long will they be there?

**Response:** The current plan calls for three staging areas: two closer to Keolu Drive and one near Kawainui Canal. Staging areas are likely to be in place 2-3 months. To develop the project concept schedule, microtunneling is assumed to proceed at an average rate of 30 feet per day.