Kalawahine Streamside

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GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

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STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

'98 MAY 13 P4:30

May 13, 1998

Mr. Gary Gill, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Finding of No Significant Impact (FONSI) for Kalawahine Streamside, TMK# (1) 2-4-34:08 (por.), 09, 11, and 22; (1) 2-4-39:01; and (1) 2-4-42:01 (por.) and 37, Honolulu, Oahu, Hawaii

The Department of Hawaiian Home Lands has reviewed comments received during the 30-day public comment period which began on April 8, 1998. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the May 23, 1998 OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form and four copies of the final EA. Please call Michele Otake, Housing Development Specialist at 587-6451, if you have any questions.

Aloha,

KALI WATSON, Chairman
Hawaiian Homes Commission

Enc. (5)

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Kalāwahine Streamside

Final Environmental Assessment

Department of Hawaiian Home Lands
Kamehameha Investment Corporation

May 1998

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Kalāwahine Streamside

Final Environmental Assessment

Department of Hawaiian Home Lands
Kamehameha Investment Corporation

Prepared by
PBR HAWAII

May 1998

KALĀWAHINE STREAMSIDE
Final Environmental Assessment

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INTRODUCTORY INFORMATION

PROJECT TEAM

Applicant:	Department of Hawaiian Home Lands State of Hawai'i P.O. Box 1879 Honolulu, Hawai'i 96805
Applicant's Representative:	Kamehameha Investment Corporation 567 South King Street, Suite 600 Honolulu, Hawai'i 96813
Architect:	Design Partners. Inc. 1580 Makaloa Street, Suite 1100 Honolulu, Hawai'i 96814
Civil Engineer:	Sato & Associates, Inc. 2046 S. King Street Honolulu, Hawai'i 96826
Soils Engineer:	Ernest K. Hirata & Associates 99–1433 Koaha Place Aiea, Hawai'i 96701–3279
Landscape Architect & Environmental Assessment Preparer:	PBR HAWAI'I Pacific Tower, Suite 650 1001 Bishop Street Honolulu, Hawai'i 96813

PURPOSE OF THIS DOCUMENT

This Draft Environmental Assessment ("EA") has been prepared for the Kalāwahine Streamside project to allow the development of a residential subdivision which is intended to provide housing opportunities for native Hawaiians as required by the Hawaiian Homes Commission Act.

Chapter 343 compliance is triggered by the use of public lands and funds. The project lands are owned by the State of Hawai'i Department of Hawaiian Home Lands (DHHL) and will utilize funds provided by the State of Hawai'i.

This EA is prepared in compliance with the provisions of *Hawai'i Revised Statutes* Chapter 343 and Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules. This Draft EA is being filed with the Office of Environmental Quality Control for public review and comment.

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1.0 Introduction

1.0 INTRODUCTION

Section 1 provides a project summary and background of the proposed development, including location, land ownership, property description, and land uses on the surrounding properties.

1.1 PROJECT SUMMARY

Project Name:	Kalāwahine Streamside
Applicant:	Department of Hawaiian Home Lands Kamehameha Investment Corporation
Landowner:	State of Hawai'i, Department of Hawaiian Home Lands State of Hawai'i, Department of Land and Natural Resources
Tax Map Key:	(1) 2–4–34:08 (por.), 09 (por.), 11 & 22 (1) 2–4–39:01 & 02 (1) 2–4–40:01 (1) 2–4–42:01 (por.) & 37
Project Area:	Approximately 15 acres of a 26.5–acre site
Existing Use:	Vacant; dwelling on TMK: 2–4–42:37
Proposed Uses:	Residential Subdivision
Land Use Designations:	– State Land Use: Urban – Development Plan Land Use Map: Preservation – Zoning: P–2 General Preservation – Zoning Special District: Punchbowl Special District
Special Management Area:	The project is not in the SMA
Action Requested:	Compliance with Chapter 343, *Hawai'i Revised Statutes* and Hawai'i Administrative Rules, Title 11, DOH, Chapter 200
Accepting Authority:	Department of Hawaiian Home Lands

1.2 LOCATION

The project site is in a centralized location at Papakōlea, within the City and County of Honolulu on O'ahu (Figure 1). The project is adjacent to Tantalus Drive with an existing access through an unimproved culvert crossing from 'Iaukea Street. Kanahā Stream separates the site from the adjacent residential properties in the Department of Hawaiian Home Lands (DHHL) Papakōlea Residence Lots.

The project site consists of 26.5 acres and is identified as TMK Parcels: 2–94–34:08 (por.), 09 (por.), 11 & 22; 2–4–39:01 & 02; and 2–4–40:01 and contains approximately 26.5 acres. In addition, TMK: 2–4–42:01 (por.) & 37 within the Papakōlea Residence Lots would be affected by the development of a new access roadway to the project. TMK maps are shown in Figures 2A, 2B, 2C, and 2D. The project utilizes lands suitable for home construction; the development area is approximately 15 acres of the 26.5–acre site.

1.3 BACKGROUND

The Kalāwahine Streamside site was in the original inventory of the Hawaiian Homes Commission prior to 1952. Through a land exchange, the parcel was removed from the inventory. Through Act 150, Session Laws of Hawai'i, 1990, approximately 14 acres were returned and the remaining acreage (minus the Board of Water Supply site) comprises a majority of the project site.

To allocate the land resources administered by DHHL, the Hawaiian Homes Commission has established waiting lists for three basic types of homesteads – residential, agricultural and pastoral. There are currently more than 29,000 applications on file with the DHHL for homestead awards. A qualified applicant may apply for and receive a residential and either an agricultural or a pastoral award. If a qualified applicant receives a residential award, the applicant must surrender the agricultural lease, if the land is improved. It is estimated that the number of individuals waiting for homestead awards is actually about 16,000. A dwelling can be constructed on only one of the homesteads lots.

Each island has its own waiting list of homestead applicants. Due to the historically long waiting period and age of those waiting for residential lots on O'ahu, land use planning priorities of DHHL have centered on providing for these applicants. A prominent feature of the waiting list is the demand for residential lots on the island of O'ahu. As seen in Table 1, the demand as of June 30, 1997, included 6,014 applications for residential lease awards.

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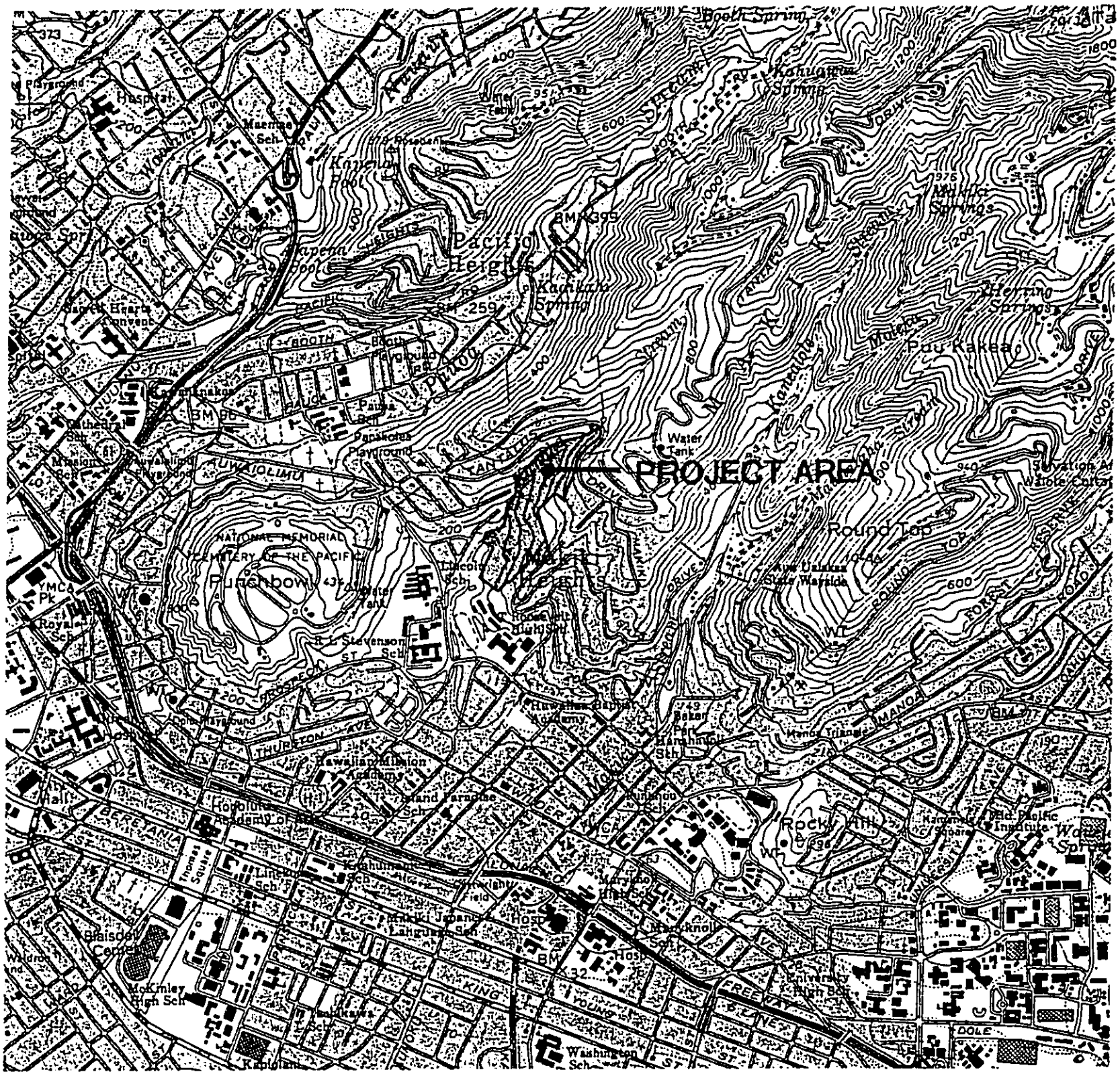

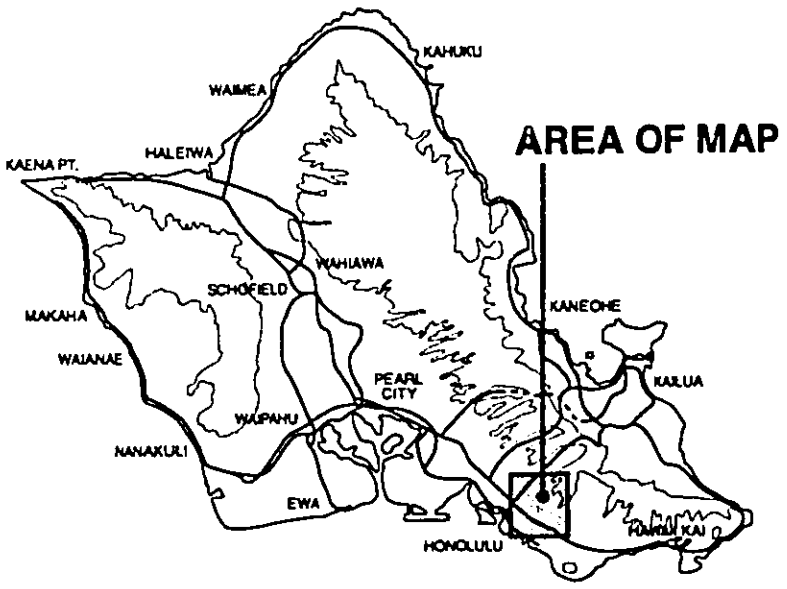

FIGURE 1
Regional Location Map
KALĀWAHINE STREAMSIDE

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March 1998

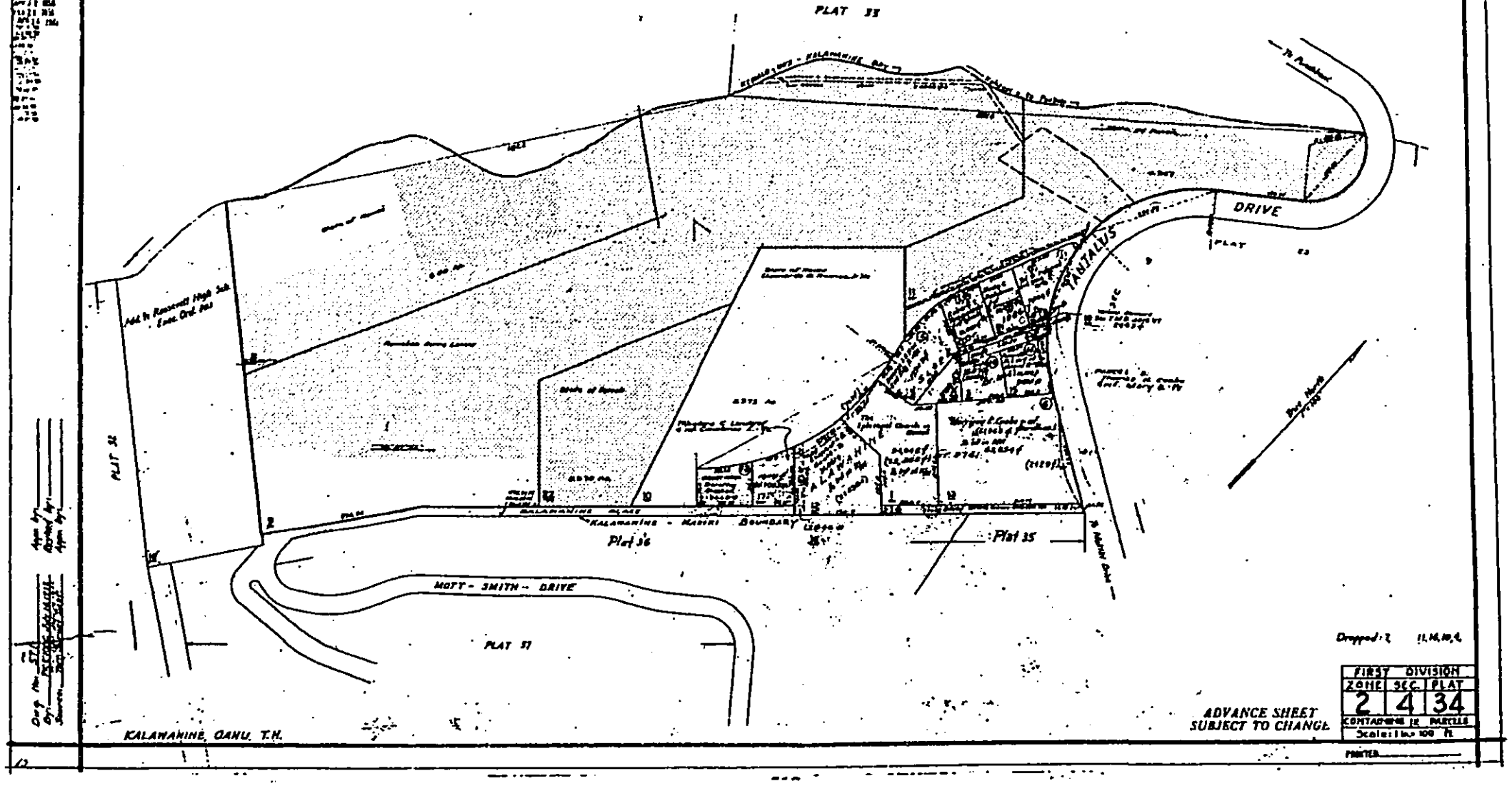


FIGURE 2A
Tax Map Key / Land Ownership Map
KALĀWAHINE STREAMSIDE

Source: City & County of Honolulu - Property Tax Division

March 1998

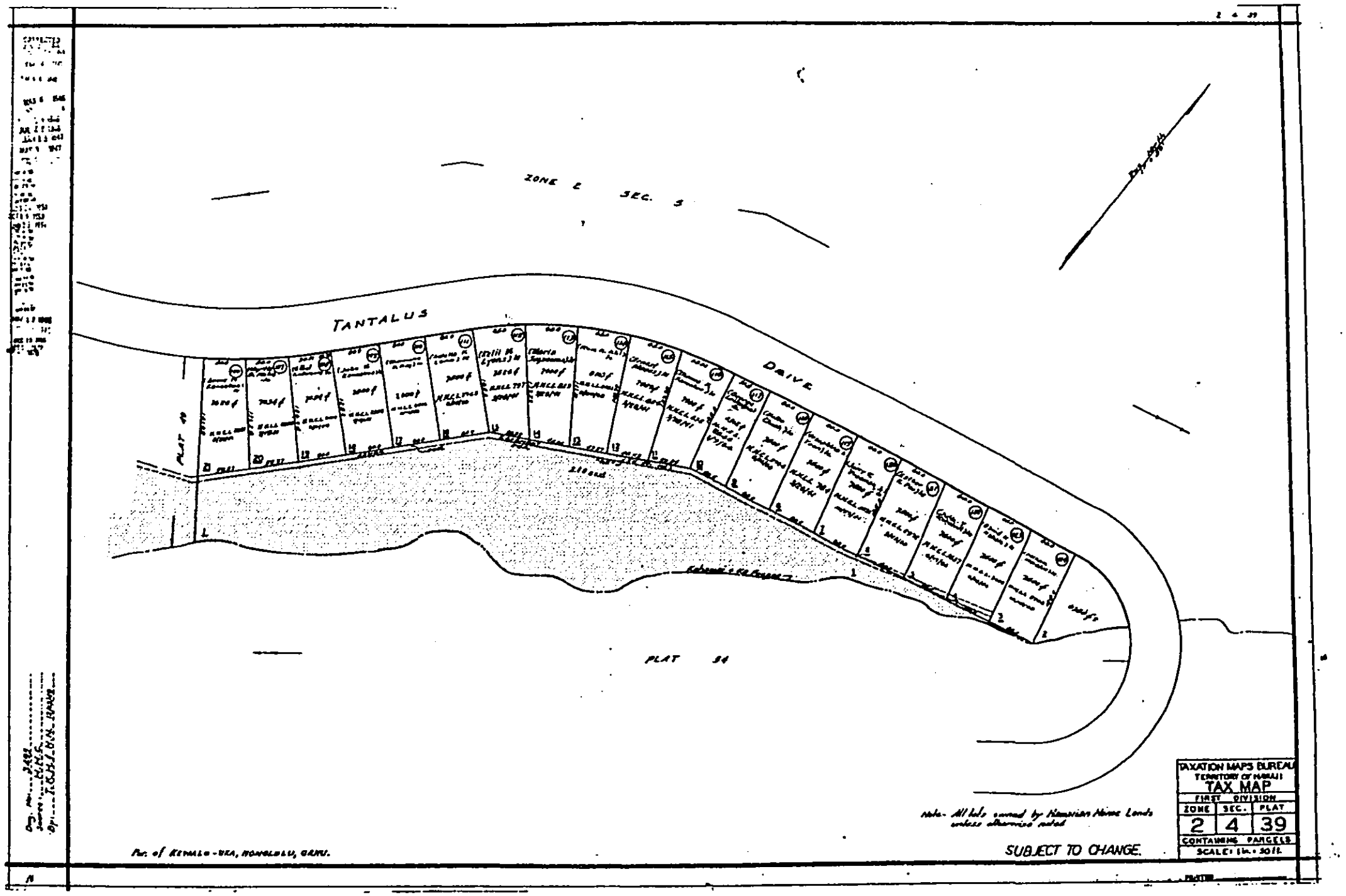


FIGURE 2B
Tax Map Key / Land Ownership Map
KALĀWAHINE STREAMSIDE

Source: City & County of Honolulu - Property Tax Division

March 1998

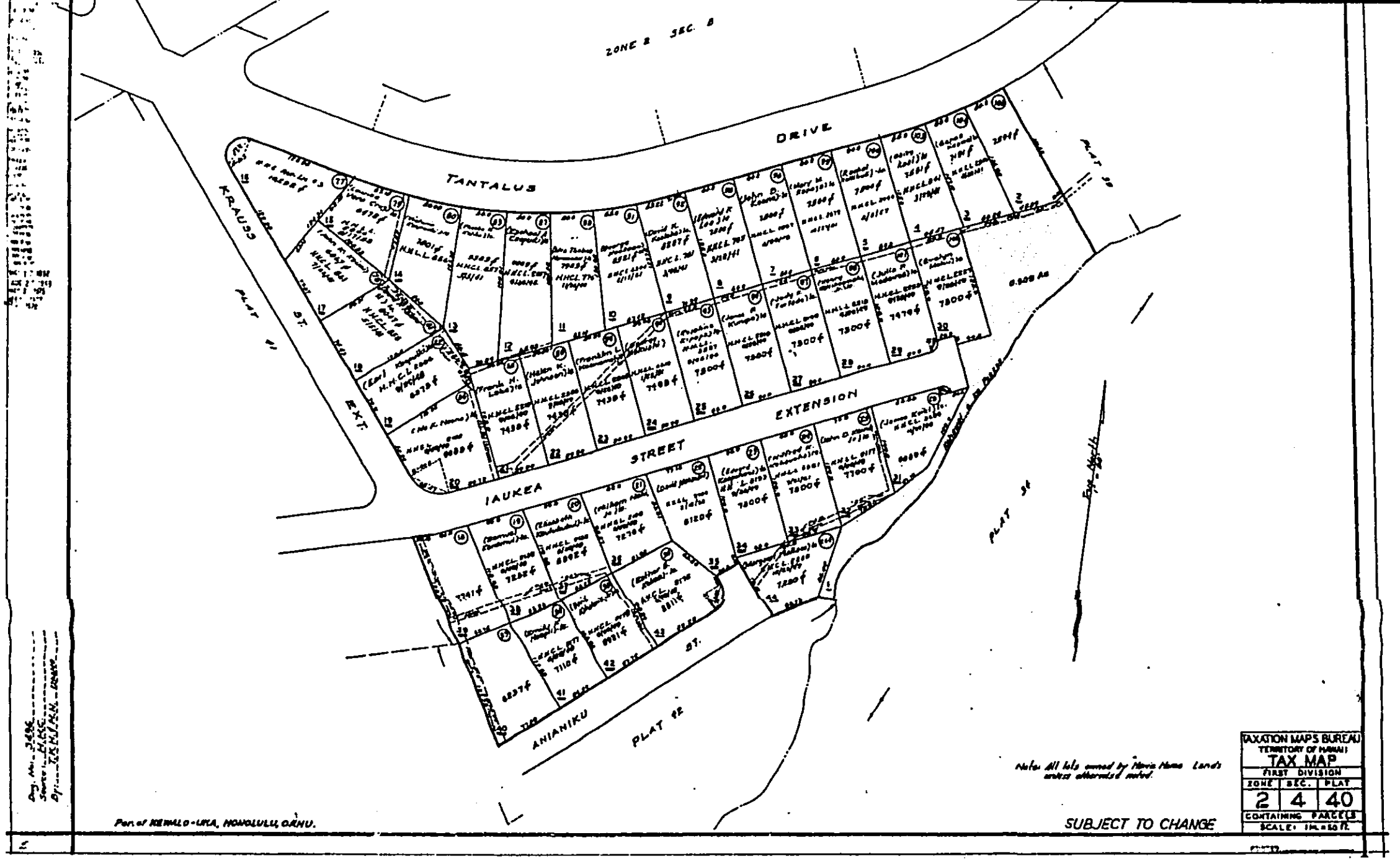


FIGURE 2C
Tax Map Key / Lan Ownership Map

KALĀWAHINE STREAMSIDE

Source: City & County of Honolulu - Property Tax Division

May 1998

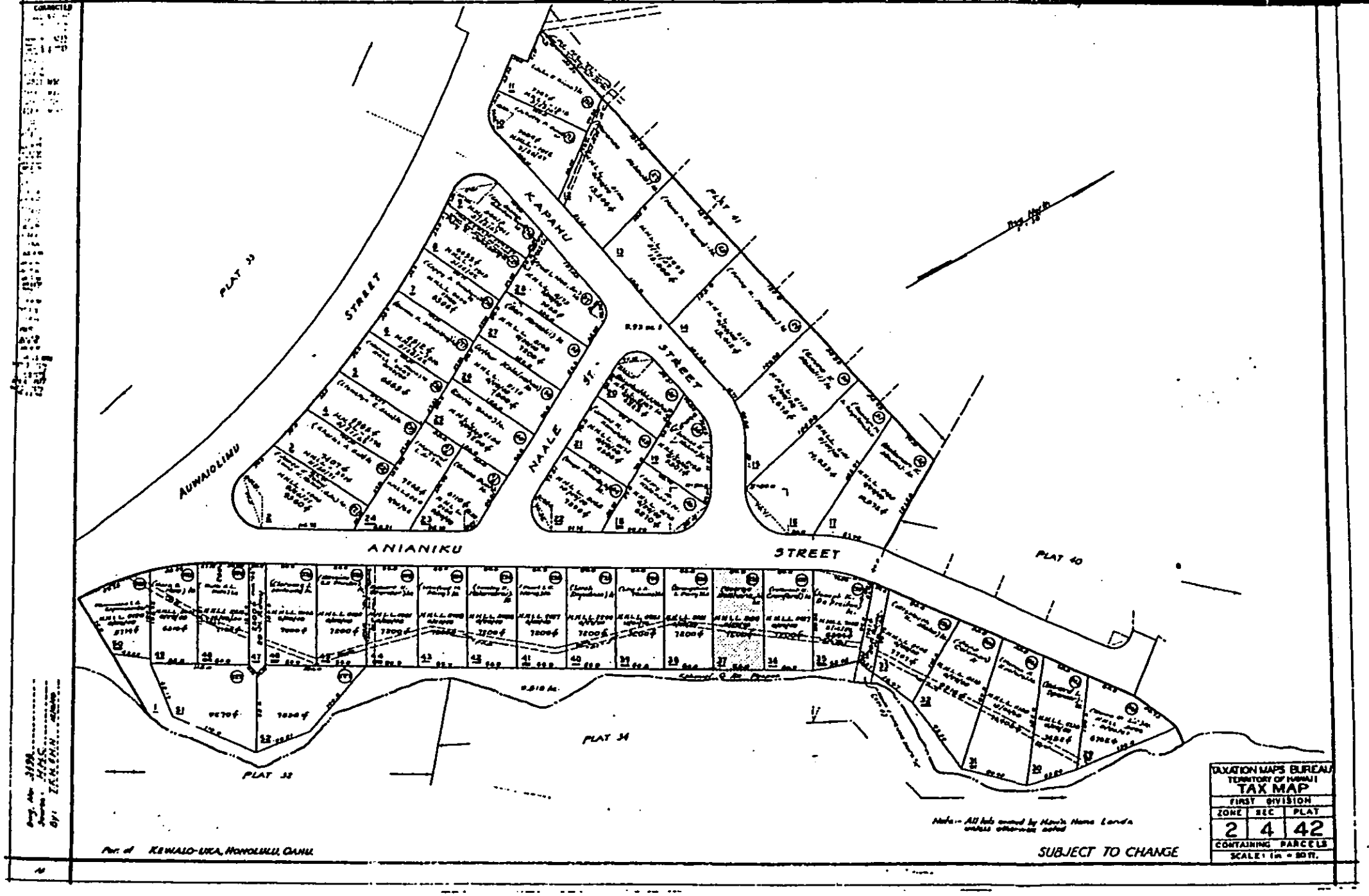


FIGURE 2D
Tax Map Key / Access Roadway Lots
KALĀWAHINE STREAMSIDE

Source: City & County of Honolulu - Property Tax Division

May 1998

PBR HAWAII

TABLE 1
DHHL HOMESTEAD APPLICATIONS

Island	Residential	Agricultural	Pastoral	Total
O'ahu	6,014	1,270	0	7,284
Maui	2,723	2,684	336	5,743
Hawai'i	4,839	5,130	1,151	11,120
Kaua'i	1,527	1,671	187	3,385
Moloka'i	711	780	139	1,630
Total	15,814	11,535	1,813	29,162

Source: Department of Hawaiian Home Lands, June, 1997.

1.4 NEED FOR THE PROJECT

As of June 30, 1997, DHHL has fulfilled 2,797 awards on O'ahu with a major provision of single–family homes in Waimānalo, Nānākuli and Wai'anae. Still, the number of new applications continue to increase, and the need for residential homestead lots persist.

The unique challenge of DHHL homesteads concerns financing. DHHL lands cannot be sold, therefore, special arrangements have been necessary to secure mortgage financing. To simplify financing and avoid individual homestead lessees handling their own house construction contracts, one goal of DHHL is to provide lots with already constructed homes. A report entitled *Site Assessment and Feasibility Reports* (Group 70, 1992) was prepared to assess the subject site's potential for residential development. The conclusions of the report determined the suitability of the subject site for single–family and duplex housing.

The Kalāwahine Streamside project will offer to qualified native Hawaiians quality homes in a well designed community in urban Honolulu.

1.5 IDENTIFICATION OF THE LANDOWNER

The majority of the land is owned by the DHHL. The legal basis for the existence of DHHL is the Hawaiian Homes Commission Act of 1920 (HHCA), as amended. The Act was passed by the U.S. Congress and signed into law by President Warren Harding on July 9, 1921. DHHL is one of 18 agencies of the Executive Branch of the State of Hawai'i. It differs from other executive departments in a number of respects:

- DHHL serves a special clientele. Its mission is to effectively manage the Hawaiian Homes Lands trust, and to develop and deliver land to native Hawaiians. Native Hawaiians are defined by the HHCA as individuals of no less than one half part of the blood of the races inhabiting the Hawaiian Islands prior to 1778.

- The Department currently manages a land trust consisting of approximately 200,000 acres of land on Hawai'i, Maui, Moloka'i, O'ahu, and Kaua'i.

DHHL provides direct benefits to native Hawaiians in the form of 99–year homestead leases at an annual rental of $1 for residential, agricultural or pastoral purposes. The intent of the homesteading program is to encourage and support economic self–sufficiency of native Hawaiians through the provision of land. Other benefits provided by the HHCA include financial assistance through direct loans or loan guarantees for home construction, home replacement or repair, and for the development of farms and ranches; technical assistance to farmers and ranchers, and the operation of water systems. In addition to administering the homesteading program, DHHL is also authorized to lease land and issue revocable permits, licenses and rights–of–entry for lands not in homestead use. Revenues from lands in commercial, industrial and other income–producing uses support homestead development activities.

1.6 DESCRIPTION OF THE PROPERTY

The project site consists of several land parcels (TMK: 2–4–34:08 (por.), 09 (por.), 11 & 22; 2–4–39:01 (por.) & 02; 2–4–40:01) with a total land area of approximately 26.5 acres located at Papakōlea in Honolulu adjacent to existing single–family Hawaiian Home Land residential homesteads. The new proposed access roadway will also affect two off–site DHHL properties (TMK: 2–4–42:01 (por.) and 37). The hillside site is located in the Kanahā Stream ravine between the valleys of Pauoa and Makiki. Kanahā Stream is an intermittent stream. Elevations of the site range from 140 feet MSL to 500 feet MSL.

Parcel TMK: 2–4–34:08 is owned by the State of Hawai'i Department of Land and Natural Resources. The City and County of Honolulu Board of Water Supply (BWS) has possession of this vacant parcel by way of Executive Order Nos. 1529 and 3281. The DHHL is currently in the process of acquiring a 4.5 acre portion of this site for inclusion as part of the Kalāwahine Streamside project. BWS will maintain 1.5 acres of TMK: 2–4–34:08 for future uses.

On April 9, 1998, the Board of Land and Natural Resources approved the withdrawal of 4.5 acres from TMK 2–4–34:08 and the transfer of this land to DHHL.

1.7 SURROUNDING LAND USES

The property is situated in urban Honolulu and is within minutes of downtown Honolulu. The Punchbowl National Memorial Cemetery of the Pacific is located to the southwest and Tantalus to the north. Other surrounding communities include Makiki to the east and Pauoa to the northwest.

Immediately surrounding the property are Tantalus Drive which wraps around the northern tip of the property and the existing DHHL Papakōlea Residence Lots single–family properties are to the west. The residential homestead is further identified by geographic areas; the upper area is known as Papakōlea and the lower area is called Kewalo. Roosevelt High School is to the south, and single family homes are on Kalāwahine Place to the east. Lincoln Elementary School and Stevenson Intermediate School are also within a short distance of the subject property.

1.8 AGENCIES CONSULTED IN THE PREPARATION OF THE EA

The following agencies and organizations have been consulted during the planning process and for the preparation of the Environmental Assessment:

City and County of Honolulu

Board of Water Supply
Building Department
Department of Land Utilization
Department of Parks and Recreation
Department of Public Works
Department of Transportation Services
Department of Wastewater Management
Fire Department
Planning Department
Police Department

State of Hawai'i

Department of Business, Economic Development and Tourism Planning Office
Department of Education
Department of Health
Department of Land and Natural Resources
Department of Land and Natural Resources Commission on Water Resource Management
Department of Land and Natural Resources – Historic Preservation Division
Housing Finance Development Corporation
Office of Environmental Quality Control
Office of Hawaiian Affairs

Federal Government

U.S. Army Corps of Engineers

Community

County and State Representatives for the Area
Kewalo Community
Neighborhood Board No. 10, Makiki Heights
Neighborhood Board No. 12, Nu'uanu/Punchbowl
Papakōlea Community Association

2.0 Project Description

2.0 PROJECT DESCRIPTION

The proposed project, construction activities, and a preliminary development timetable and approximate development costs are described in this section.

2.1 PROJECT DEVELOPMENT GOALS

The goal of the project is to create a quality community for native Hawaiians in urban Honolulu. Kalāwahine Streamside is designed to be a new residential subdivision which will be an outstanding example of quality design and construction.

The Conceptual Master Plan (Figure 3) for the project depicts a development of 95 dwelling units which include 27 single–family and 68 duplex–family homes. The sloped topography of the site will be conducive to building hillside homes, thus, offering panoramic views from many areas of the sites. The duplex–family units will consist of two homes which will have many features and benefits of a single–family home, including separate individual lots. Kalāwahine Streamside would be a premier model for future housing developments of this type.

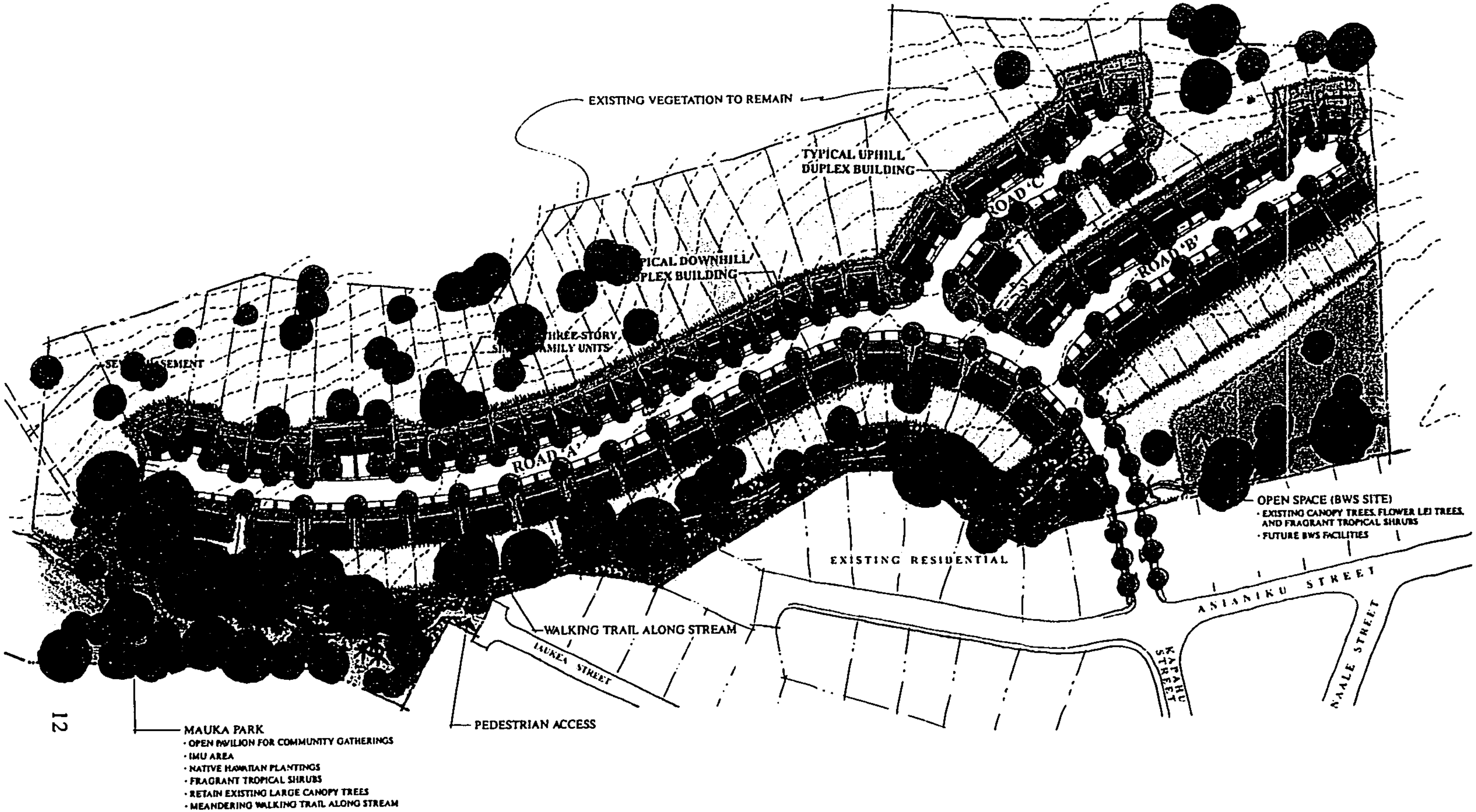
The housing will be made available to qualified native Hawaiians who are currently on the DHHL residential wait–list.

2.2 DESIGN CONCEPT

The design theme of the Kalāwahine Streamside project is notably for a kama'aina island lifestyle. Buildings are oriented to promote the best views. Existing trees along the stream and new landscape plantings will create a visual buffer from the adjacent neighborhoods. The site design is confined to areas of the property with buildable slopes. Thus, the back pali wall will remain in its natural vegetated state. Site grading will follow the existing topography. The building scale will be compatible with the scale of the neighborhood. The Hawaiian design theme will enhance the surrounding neighborhood.

Kalāwahine Streamside homes will have striking rooflines and railings and trim which will feature Hawaiian tapa motifs. All designs include generous storage and quality appliances. Two–car enclosed garages with ample laundry area and large buffet counters in the kitchen allow for casual "Hawai'i style" dining. Lots range from 3,750 square feet to approximately 18,000 square feet. The quality design and construction, views and convenient proximity to downtown Honolulu are attributes of the project.

Architectural design elements not only include aesthetic Hawaiian tapa motifs but also include elements that will maximize prevailing trade winds through large windows and lanais. Fixtures, including toilets, showers, and sinks will be the energy saver type for water conservation. Conventional electrical hook–ups will service all homes. Solar energy panels will be installed at the discretion of individual homeowners. Energy efficient light fixtures will be specified for the kitchen and bathroom areas.



Unit Summary

1. UPHILL SINGLE FAMILY UNITS = 27 Units
   3-Bedroom, 2-1/2-Bath @ 1,444 SF
2. DOWNHILL DUPLEX UNITS = 54 Units
   3-Bedroom, 2-1/2-Bath @ 1,362 SF
3. UPHILL DUPLEX UNITS = 14 Units
   3-Bedroom, 2-Bath @ 1,320 SF

Total Units = 95 Units

FIGURE 3
Conceptual Master Plan

KALĀWAHINE STREAMSIDE

May 1998

Source: Design Partners Incorporated
PBR Hawaii

2.3 PROJECT COMPONENTS

Kalāwahine Streamside is a residential subdivision offering single–family and duplex homes in a lush landscaped environment which will also include recreational amenities including park facilities and a streamside walking trail.

2.3.1 Access Roadway

Access to the project will be through an extension of Kapahu Street in the Kewalo neighborhood. The extension will affect an existing Hawaiian Home Lands lessee in the Papakōlea Residence Lots and will also require a box culvert across Kanahā Stream.

2.3.2 Single–Family Residential Homes

The three–story homes have 1,444 square feet of living area and 2,018 gross square footage and will feature a three bedroom, two and a half bath design (Figure 4A). The price range of the single–family homes is estimated at $215,000 to $235,000.

2.3.3 Duplex Residential Homes

The duplex split–level homes have two models. Three–story downhill duplex homes have better views while the uphill duplex units offer the convenience of having the living areas on one floor. The two–story uphill duplex homes will have three bedrooms and two bathrooms with 1,320 square feet of living area and 1,917 gross square footage. The three–story downhill models will feature three bedrooms, two–and–one–half bathrooms with 1,362 square feet of living area and 1,854 gross square footage (Figures 4B and 4C).

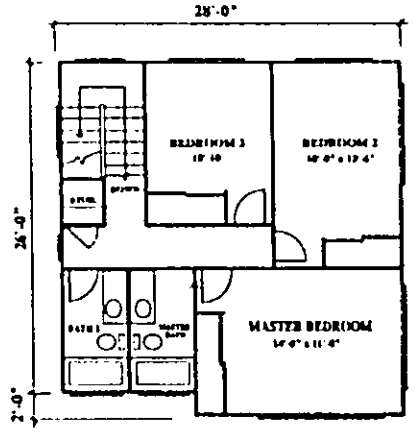
The price range of an uphill model is estimated at $180,000 to $195,000. The price range of a downhill model is estimated at $190,000 to $205,000.

2.3.4 Recreational Amenities

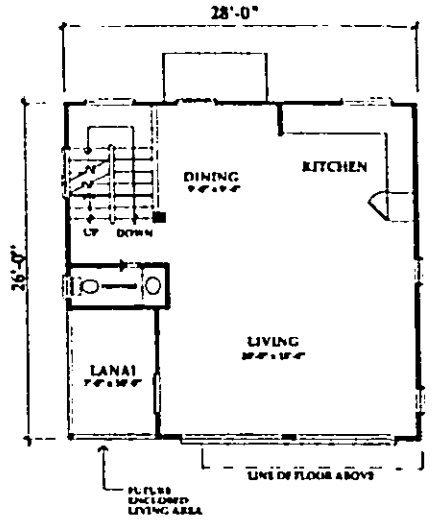
A mauka–makai linear parkway system will provide recreational opportunities for Kalāwahine Streamside residents, as well as the neighboring Papakōlea and Kewalo residents. A walkway trail linking the mauka and makai areas will run along Kanahā Stream; the trail will be defined by an understory of tropical vegetation below the existing canopy trees. Facilities for community gatherings will likely include an open air pavilion for shelter surrounded by lawn areas and an imu.

The parkway system will terminate at the Board of Water Supply lot at the southern or makai end of the project. The BWS lot will be grassed and will serve as passive open space until some time in the future when BWS develops the site.

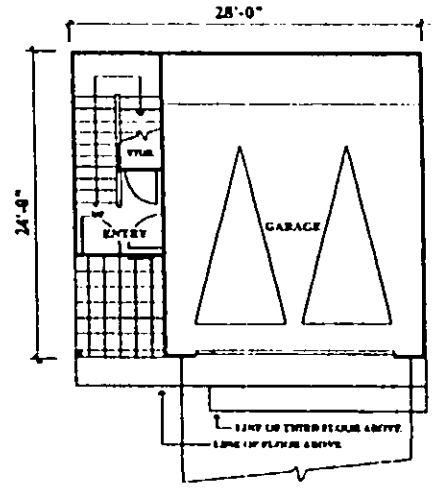
Pedestrian access for Papakōlea residents is through the existing unimproved ʻIaukea Street crossing onto the property. Vehicular access will be from Kapahu Street through the Kewalo area. Parking will be provided.



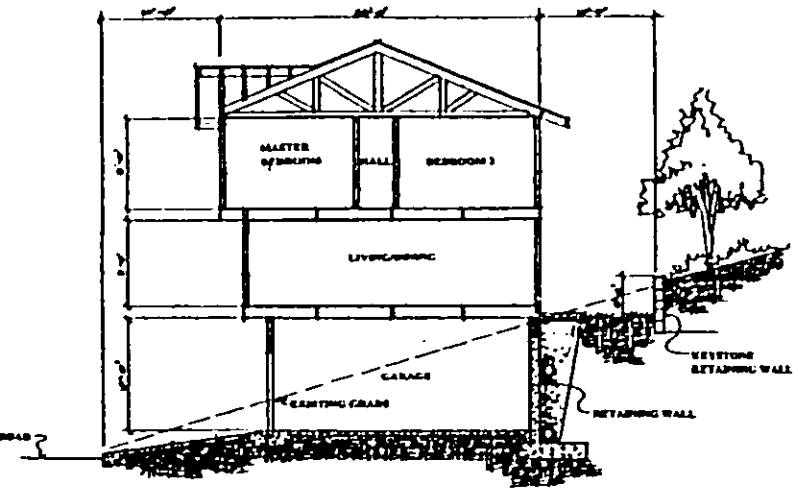
UPPER FLOOR PLAN

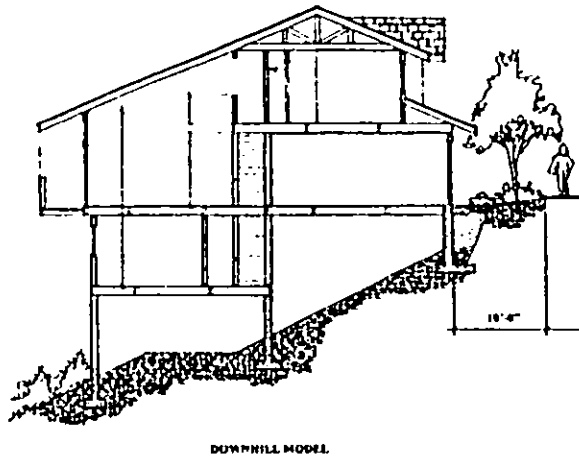


MIDDLE FLOOR PLAN



LOWER FLOOR PLAN





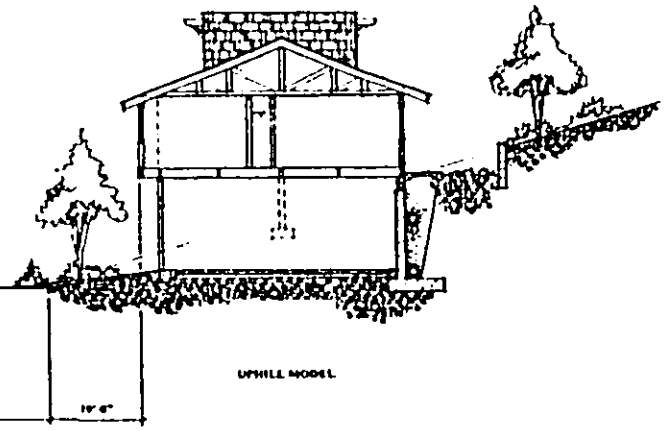
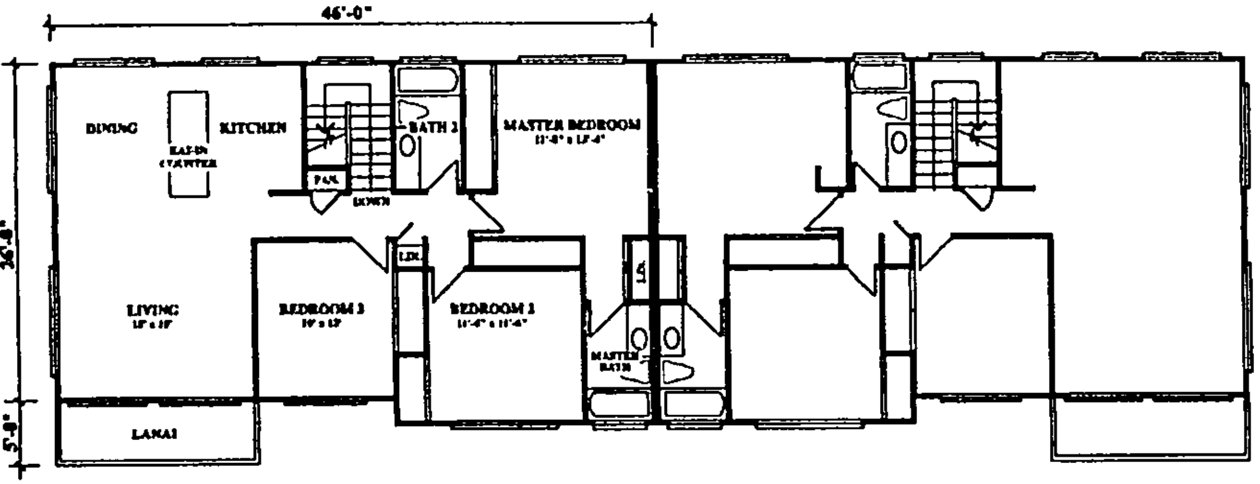


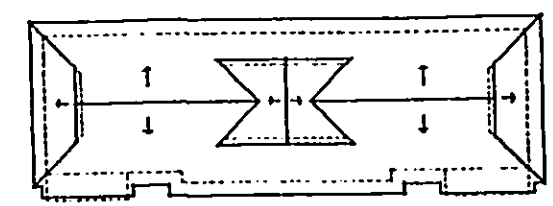
FIGURE 4A
Single Family Detached Dwelling
KALĀWAHINE STREAMSIDE

Source: Design Partners Incorporated

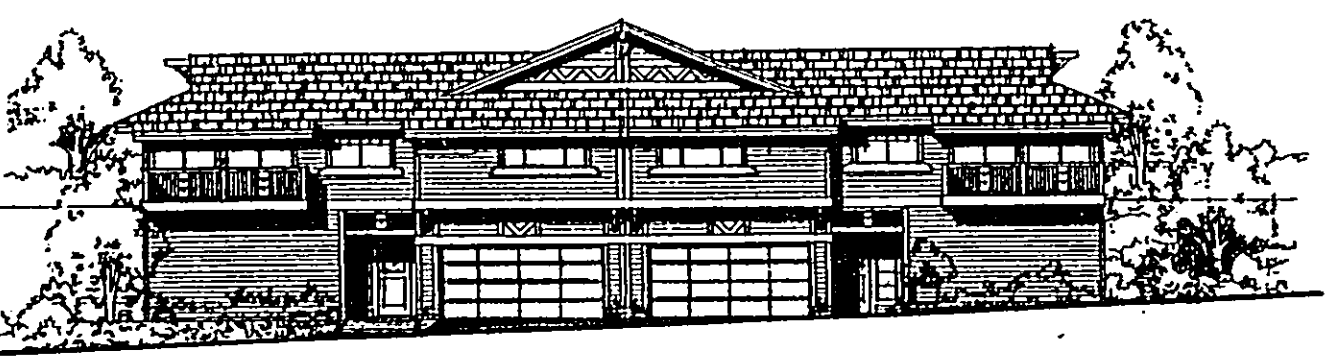
May 1998



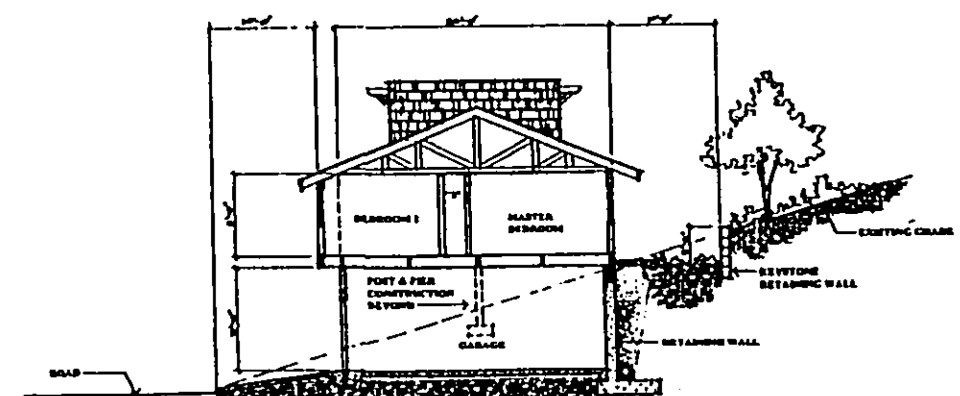
UPPER FLOOR PLAN



ROOF PLAN



FRONT ELEVATION



SECTION
@ 30% GRADE CONDITION

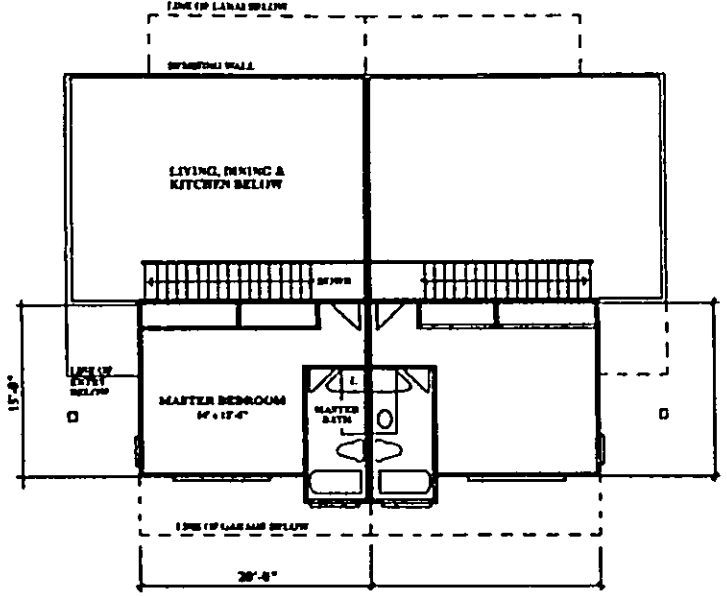
FIGURE 4B
Duplex Family Attached Dwelling
(Uphill Model)

KALĀWAHINE STREAMSIDE

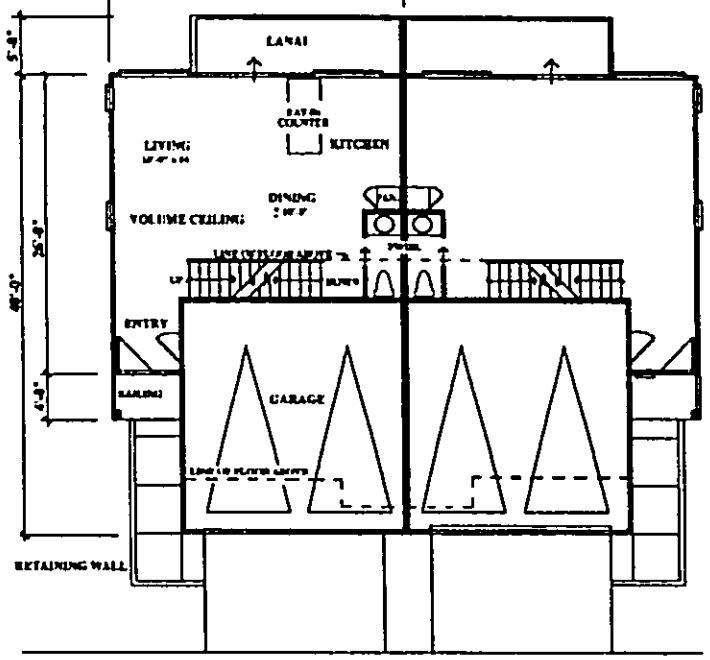
PBR HAWAII

May 1998

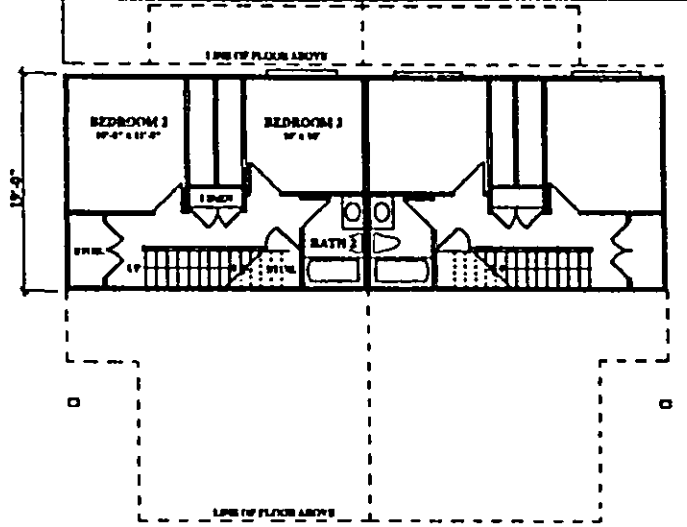
Source: Design Partners Incorporated



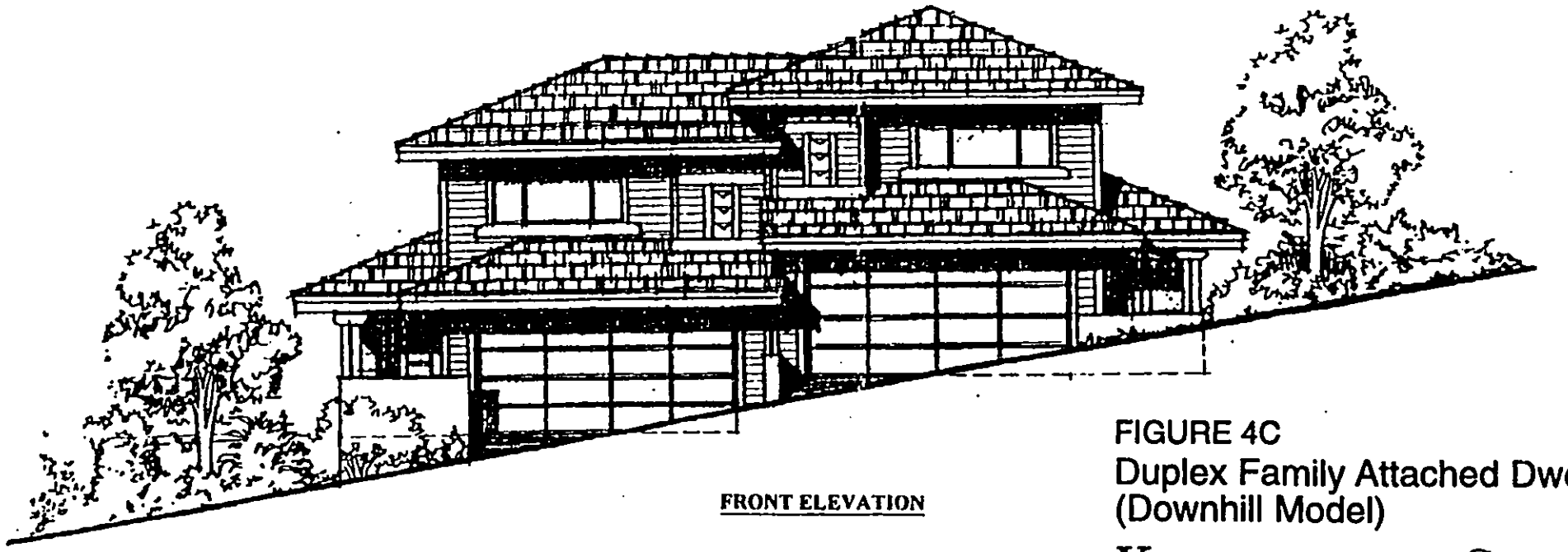
UPPER FLOOR PLAN



MIDDLE FLOOR PLAN



LOWER FLOOR PLAN



FRONT ELEVATION

FIGURE 4C
Duplex Family Attached Dwelling
(Downhill Model)

KALĀWAHINE STREAMSIDE

Source: Design Partners Incorporated

May 1998

2.3.5 Landscaped Grounds

Several large canopy trees including monkeypods, banyans and mango grow on the property. To the extent possible, these large trees will remain along the parkway system and will contribute a strong sense of the tropics to the project. To optimize the use of existing site features, the project is designed to utilize the natural topography and drainage to minimize impact. A focal point of the project landscaping is the linear park and walkway system. The intermittent Kanahā Stream has been preserved by the project master plan as a passive recreational resource. This open space feature will be adjacent to many of the new homes.

The new roadways within the project will be landscaped with street trees. Landscape plant materials will include native and tropical species such as kukui, 'ulu, puakenikeni, coconut, loulu palms, and various ginger and heliconia varieties. The natural foliage on the steep pali slopes would remain undisturbed to minimize erosion, provide privacy and act as a natural buffer from noise.

2.4 DEVELOPMENT TIMETABLE AND APPROXIMATE COSTS

The planning and conceptual design of the project is currently underway and will be followed by detailed design development. Construction is projected to commence in the fall of 1998; completion is scheduled for spring of 2000. The first homes are anticipated to be occupied in late–1999.

The estimated development cost for the Kalāwahine Streamside project is $26 million.

3.0 Land Use Conformance

3.0 LAND USE CONFORMANCE

3.1 ZONING

The entire site for the Kalāwahine Streamside project is designated by the State Land Use Commission as "Urban" (Figure 5). The City Primary Urban Center Development Plan Land Use Map designation for the property is Preservation (Figure 6). The zoning of the project site is P–2 General Preservation (Figure 7). The subject property is in the Punchbowl Special District but is not located in the area designated as the "core" area (Figure 8). According to the Land Use Ordinance duplexes and one–family and two–family detached dwellings which are not in the core area are exempt from the requirements of the Punchbowl Special District (*LUO*, Section 7.50–5). None of the project is located within the Special Management Area. The Primary Urban Center Development Plan Public Facilities Map shows a symbol within the vicinity of the project site which represents water supply improvements and sewer improvements (Figure 9).

The State Land Use designation is consistent with the proposed development. The DHHL's lands designated as "available lands" are not subject to the Development Plan and zoning ordinance designations pursuant to the Legal Memorandum dated October 23, 1987, by the State Attorney General.

3.2 CHAPTER 343, HAWAI'I REVISED STATUTES

The use of State–owned lands and State funds require compliance with Chapter 343, *Hawai'i Revised Statutes* and Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules.

The accepting agency for the Environmental Assessment is the DHHL.

3.3 APPROVALS AND PERMITS

During the implementation stages of the project, the applicant will be working with the City and County of Honolulu review agencies for examination and approval of project plans and specifications.

Approvals	Responsible Agency
Section 404 Nationwide Permit	US Army Corps of Engineers (Lead Agency)
NPDES Permit	Department of Health
Drainage/Roads	Department of Public Works
Roadways	Department of Transportation Services
Sewer	Department of Wastewater Management
Water Supply	Board of Water Supply
Handicap Accessibility	Commission on Persons with Disabilities

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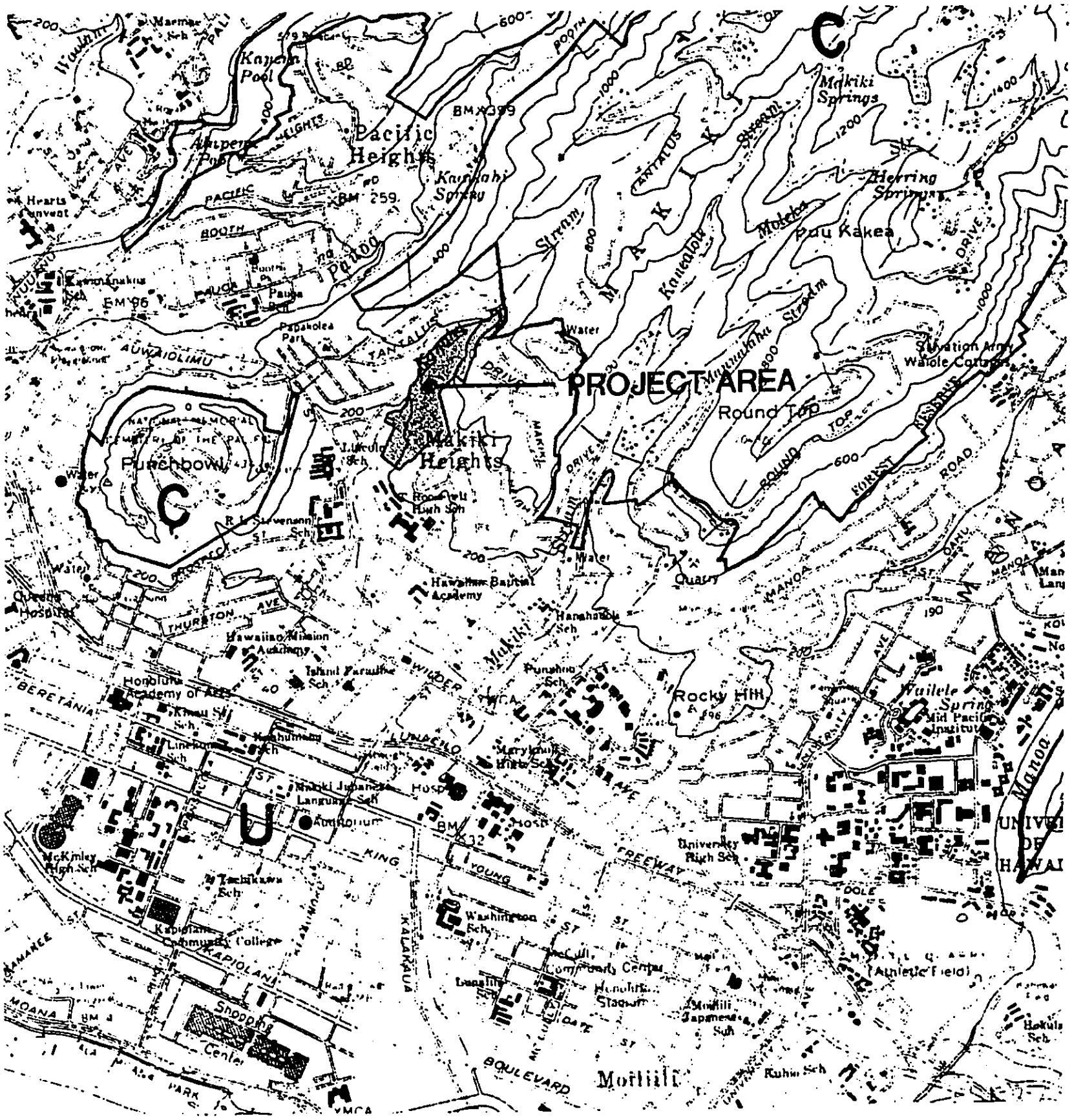

LEGEND

U	Urban
A	Agriculture
C	Conservation

Source: State Land Use Commission

FIGURE 5
State Land Use Boundary Map
KALĀWAHINE STREAMSIDE

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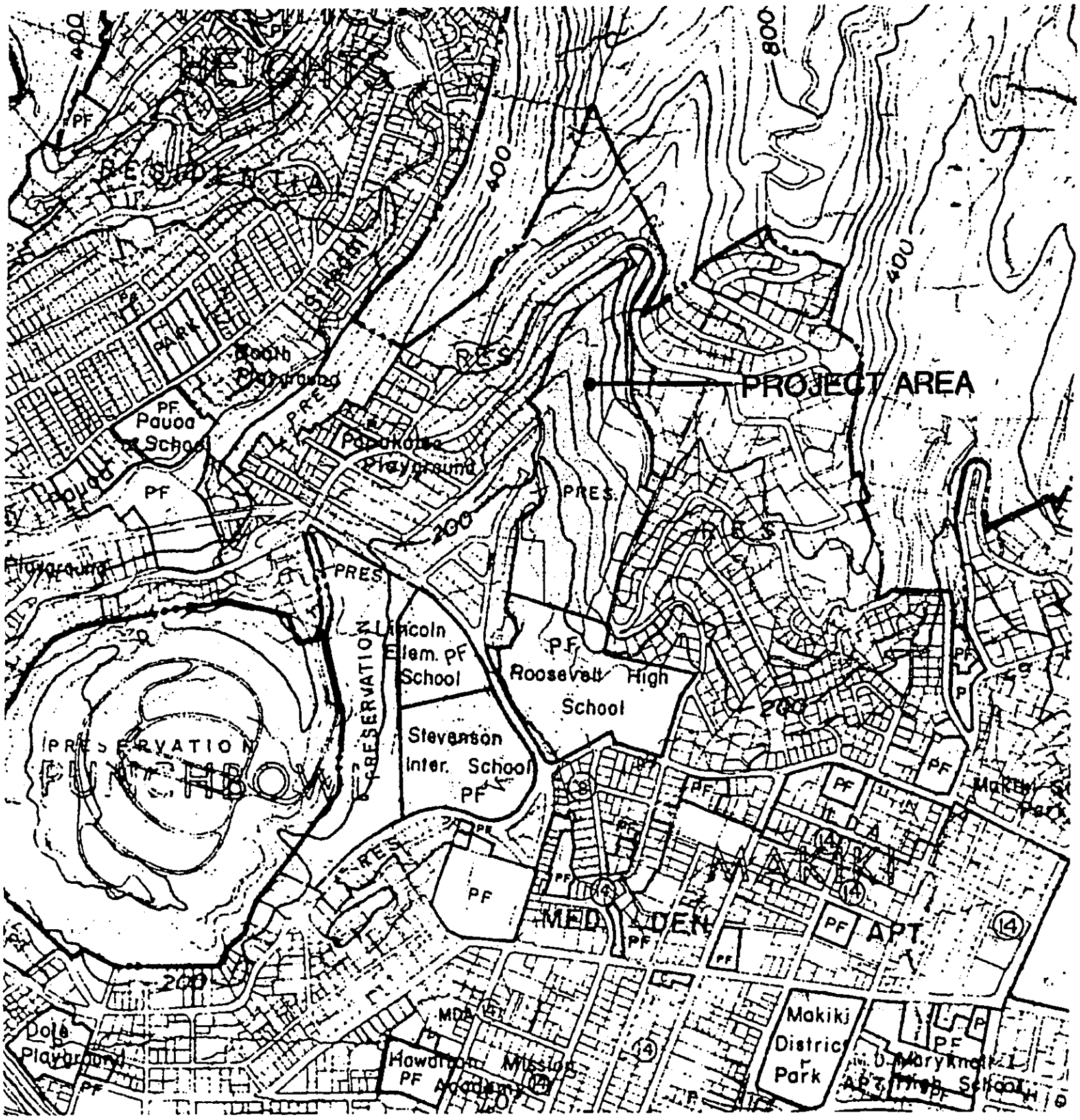

LEGEND

- DP Lines
- State Land Use Boundary Line
- DP Boundary Line

Source: City & County of Honolulu - Department of Planning, January, 1996

FIGURE 6
Primary Urban Center
Development Plan Land Use Map
KALĀWAHINE STREAMSIDE

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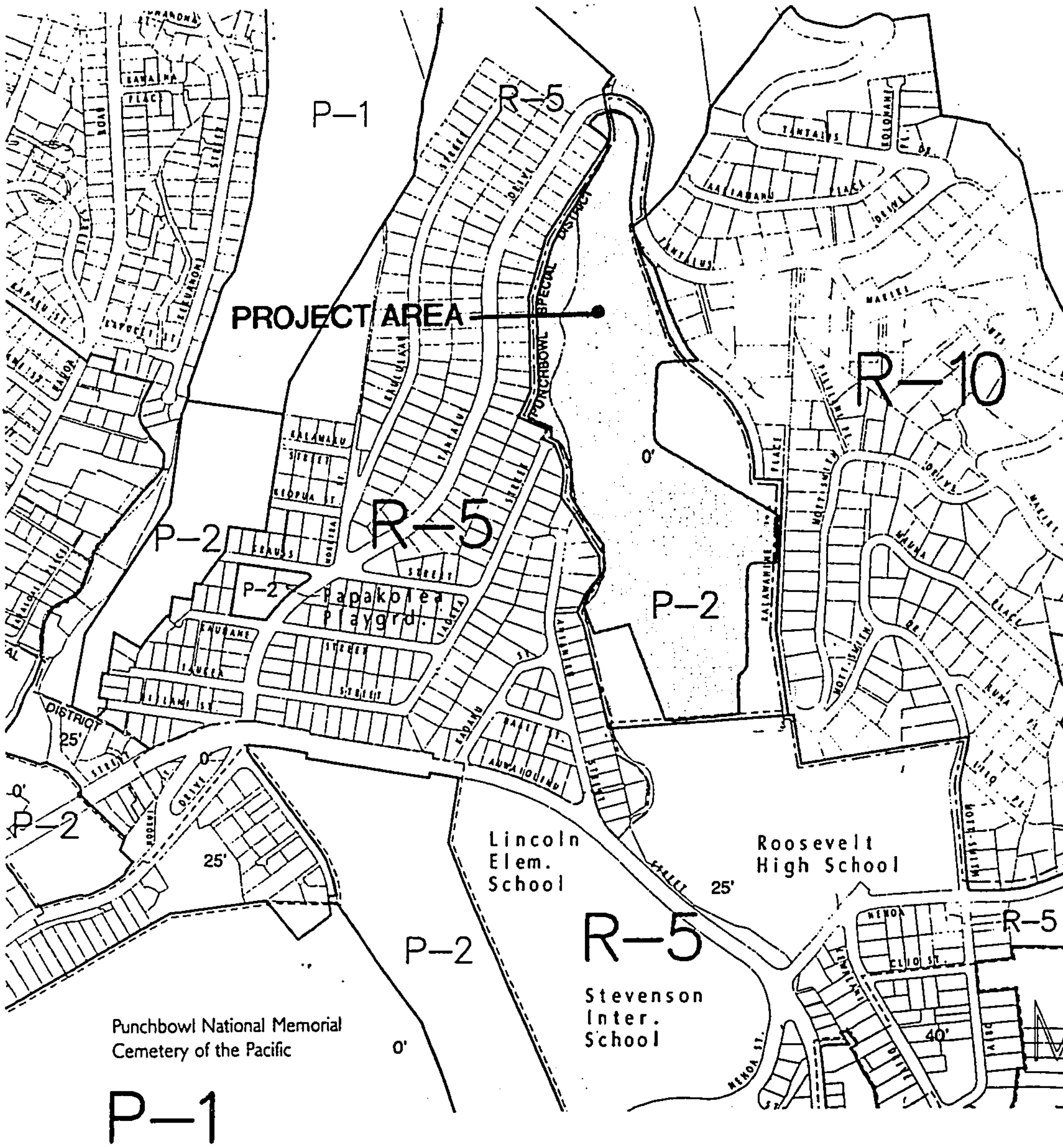

LEGEND

PRESERVATION ZONES

P-1	Restricted
P-2	General

RESIDENTIAL ZONES

R-10	Residential
R-7.5	Residential
R-5	Residential

BUSINESS ZONES

B-1	Neighborhood Business

AGRICULTURAL ZONES

AG-1	Restricted
AG-2	General

Source: Department of Land Utilization - City & County of Honolulu
October 1986

FIGURE 7
Zoning Map No. 4 (Nu`uanu-McCully)

KALĀWAHINE STREAMSIDE

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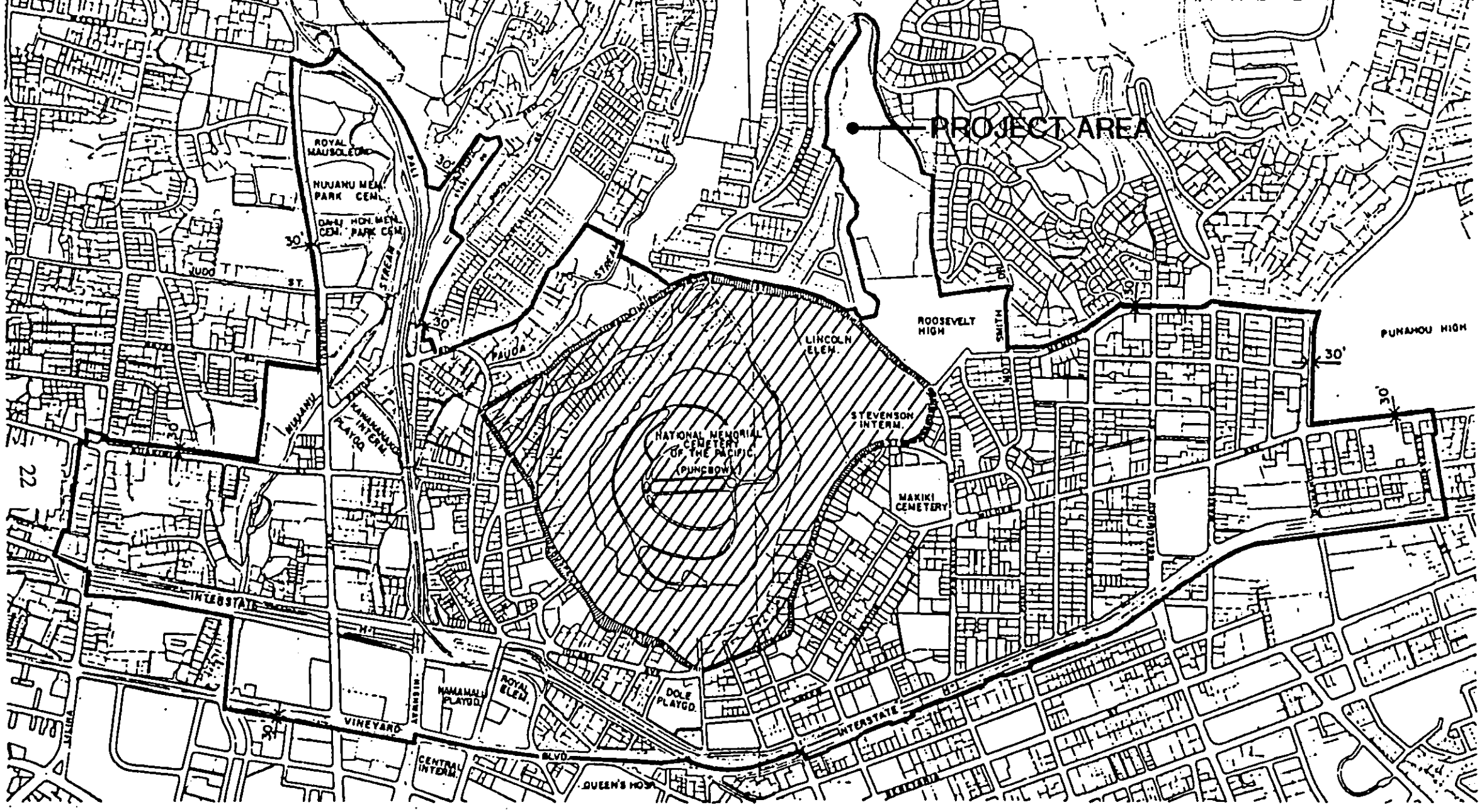

LEGEND

- Poject Site
- Punchbowl Special District
- Core Area

Source: City & County of Honolulu - Department of Land Utilization

FIGURE 8
Punchbowl Special District, Core Area

KALĀWAHINE STREAMSIDE

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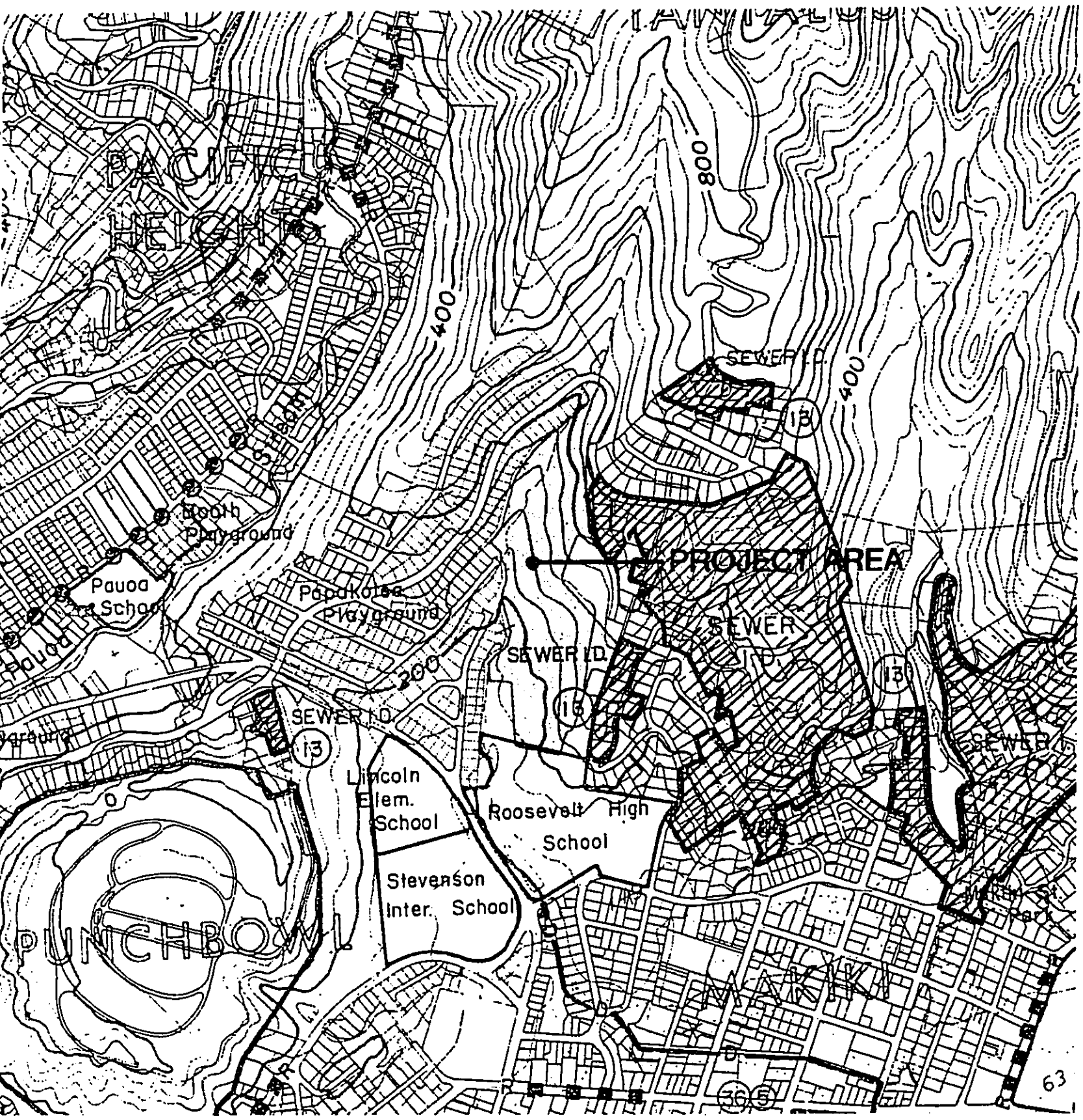

LEGEND

- DP Lines
- State Land Use Boundary Line
- DP Boundary Line

Source: City & County of Honolulu - Department of Planning, January, 1996

FIGURE 9
Primary Urban Center
Development Plan Public Facilities Map
KALĀWAHINE STREAMSIDE

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3.4 CONFORMANCE WITH STATE HOUSING POLICIES

The Kalāwahine Streamside project will further the mission of the DHHL to develop and deliver homesteads to native Hawaiians. This mission is consistent with *Hawai'i State Plan* housing policies as described in the *Housing Functional Plan.* Relevant policies include the following:

> Implementing Action A(2)(b): Form public/private partnerships and/or enter into public/private development agreements to develop affordable housing.
>
> Implementing Action A(1)(c): When appropriate, increase housing densities in residential developments to enable more lower income families to become homeowners.

The development agreement between the DHHL and its development partner, Kamehameha Investment Corporation (KIC), will efficiently deliver new homes to qualified native Hawaiians on the long–standing residential wait list. The conceptual master plan (shown in Figure 3) depicts 95 new single family and duplex homes in urban Honolulu. Each unit will range in area from 1,320 to 1,444 square feet on lots ranging from 3,750 to approximately 18,000 square feet. The design will accommodate the larger size families common to many HHL homesteads. In this regard, these homes are unique, since most homestead awards are in rural areas of O'ahu, with very few new affordable homes available in the primary urban center.

4.0 Description of the Affected Environment, Potential Impacts of the Proposed Action, and Mitigative Measures

4.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT, POTENTIAL IMPACTS OF THE PROPOSED ACTION, AND MITIGATIVE MEASURES

The environment surrounding the proposed project includes the physical or natural environment and the human or social environment. This section describes the existing conditions, potential impacts of the project to the environment and mitigative measures.

4.1 PHYSICAL CHARACTERISTICS

Papakōlea is located in near downtown Honolulu on the island of O'ahu. The project site is in a ravine of the intermittent Kanahā Stream and consists of approximately 15 acres of a 26.5–acre property.

4.1.1 Topography

The terrain of the site varies from moderate slopes at the lower portions of the site to slopes exceeding 60 percent along the back pali wall. Elevations range from 140 feet MSL along Kanahā Stream up to 500 feet along Tantalus Drive. The existing contours of the project area are shown in Figure 1.

Anticipated Impacts and Mitigative Measures

The implementation of the project will require the removal of vegetation, earthwork and grading of the site within the 15–acre development area. Exploratory soil borings encountered variable subsurface soil conditions throughout the project site. The predominant soils consisted of a surface layer of brown to grayish brown silty clay and an underlying stratum of weathered basalt. Neither groundwater nor seepage water was encountered in the borings. According to the findings of the exploratory borings study, fill slopes and cut slopes should be stable at the required gradients for upslope and downslope homes. Excavations into the surface silty clay and weathered cinder can be accomplished using conventional earth moving equipment. However, excavations into weathered basalt and the dense cobble and boulder material may require pneumatic equipment. If testing results indicate that there are any expansive clays on the site, those soils will be removed to a minimum thickness and replaced with compacted granular fill. As an alternative, spread footings or drilled footings may be founded directly on the weathered cinder or basalt.

All grading operations will be conducted in full compliance with dust and erosion control and other requirements of the City and County of Honolulu Grading Ordinance and the provisions of Chapter 11–60.1, Hawai'i Administrative Rules, Section 11–60.1–33 on fugitive dust. Best management practices (BMPs) to mitigate pollutants will be included in the construction plans.

4.1.2 Climate

The average temperatures in Papakōlea range from 65 to 88 degrees Fahrenheit with recent average annual rainfall of approximately 24 to 30 inches. Tradewinds are generally from the northeast. Strong winds do occur at times in connection with storm systems moving through the area.

Anticipated Impacts and Mitigative Measures

Design of the residential units utilizes the climatic attributes of the site and will be typical for a tropical climate. The proposed project will have no effect on climatic conditions and no mitigative measures are necessary. Project landscaping will help mitigate any localized temperature increases from parking areas, roadways and buildings.

4.1.3 Soils

There have been three soil suitability studies prepared for Hawai'i whose principal focus have been to describe the physical attributes of land and the relative productivity of different land types for agricultural production. These are: 1) Land Study Bureau Detailed Land Classification; 2) the Agricultural Lands of Importance to the State of Hawai'i (ALISH); and 3) the U.S. Department of Agriculture Soil Conservation Service (SCS) Soil Survey.

Soil Conservation Survey. As described in the *U.S.D.A. Soil Survey, Islands of Kaua'i, O'ahu, Maui, Moloka'i, and Lāna'i, State of Hawai'i*, the project site is comprised of the following soil types (Figure 10):

- The Tantalus series consist of well–drained soils on uplands on the island of O'ahu. These soils developed in volcanic ash and material weathered from cinders. They are moderately sloping to very steep. Elevations range from 100 to 2,200 feet. The annual rainfall amounts from 50 to 150 inches. It is well distributed throughout the year. The mean annual soil temperature is 70 degrees F. These soils are used for homesites, water supply and recreation.

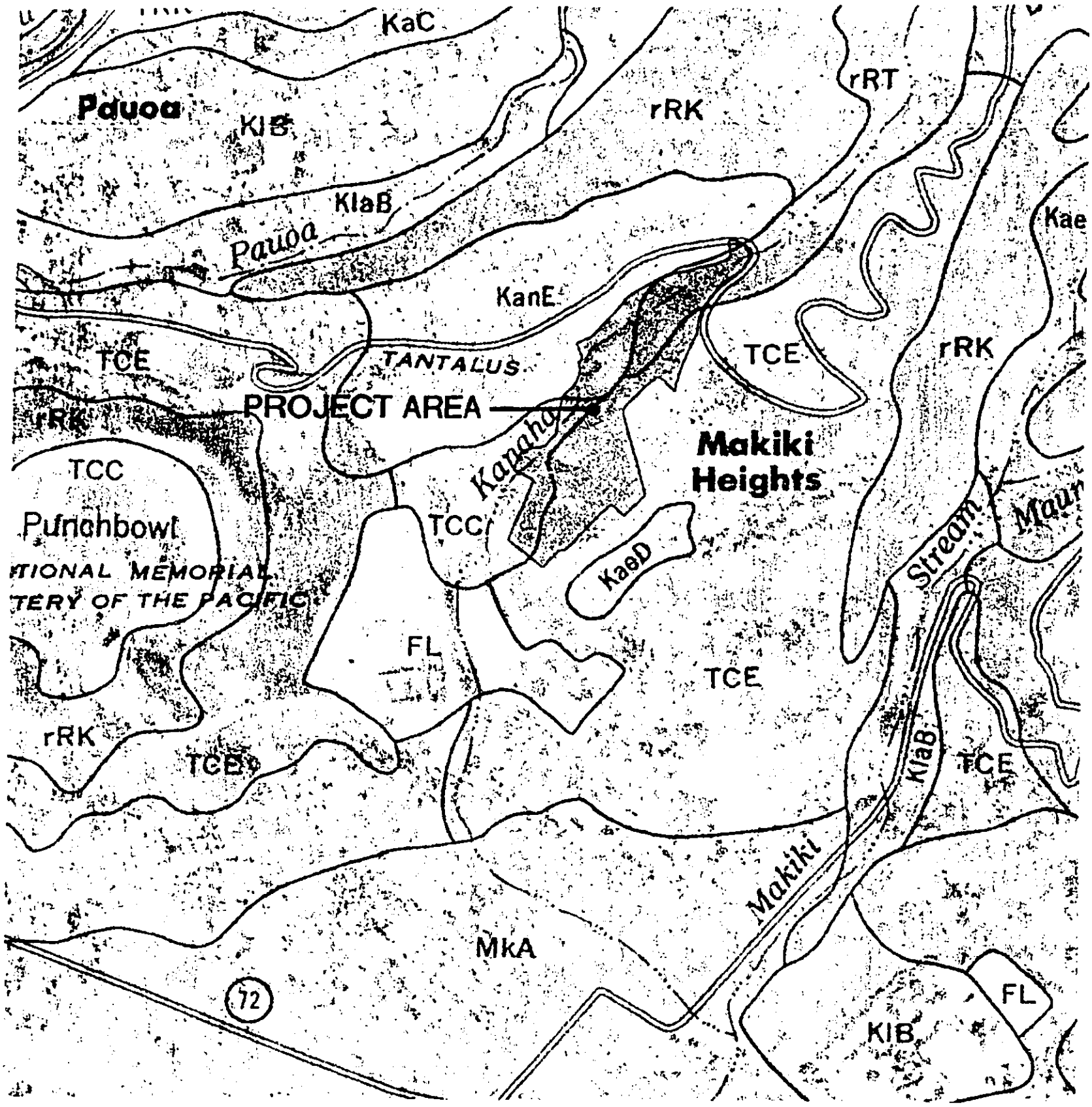
  Tantalus silty clay loam, 8 to 15 percent slopes (TCC): On this soil, runoff is slow and the erosion hazard is slight.

  Tantalus silty clay loam, 15 to 40 percent slopes (TCE): On this soil, runoff is medium and the erosion hazard is moderate.

- The Ka'ena series consists of very deep, poorly drained soils on alluvial fans and talus slopes. These soils developed in alluvium and colluvium from basic igneous material. They are gently sloping to steep and are commonly stony. Elevations range from 50 to 150 feet. The annual rainfall amounts to 30 to 45 inches.

  Ka'ena very stony clay, 10 to 35 percent slopes (KanE): This soil occurs on talus slopes and alluvial fans. It has a profile like that of Ka'ena stony clay, 6 to 12 percent slopes, except that there are many stones on the surface and in the profile. Runoff is medium to rapid and the erosion hazard is moderate to severe. Workability is difficult because the soil is stony, steep and very sticky and very plastic.

- Rough Mountainous Land (rRT) occurs in mountainous areas and consists of very steep land broken by intermittent drainage channels. Elevations range from nearly sea level to more than 6,000 feet. Over much of the area the soil mantle is very thin. It ranges from 1 inch to 10 inches in thickness over saprolite. In most places the saprolite is relatively soft and permeable to roots and water. The land surface is dominated by deep, V–shaped valleys that have extremely steep side slopes and narrow ridges.



LEGEND

TCC	Tantalus Silty Clay Loam, 8 to 15 Percent Slopes
TCE	Tantalus Silty Clay Loam, 15 to 40 Percent Slopes
KanE	Kaena Very Stony Clay, 10 to 15 Percent Slopes
rRT	Rough Mountainous Land

Source: U.S. Department of Agriculture, Soil Conservation Service & University of Hawai'i, August 1992

FIGURE 10
SCS Soil Survey
KALĀWAHINE STREAMSIDE

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Detailed Land Classification. A five–class productivity rating is applied using the letters A, B, C, D, and E with A representing the class of highest productivity and E the lowest. The physical characteristics of the soils of the property are unsuited for most soil–based forms of agriculture. The University of Hawai'i's Land Study Bureau *Detailed Land Classification of O'ahu*, has classified a portion of the project area according to the lowest overall productivity as Soils with " E105" (Figure 11).

Agricultural Lands of Importance to the State of Hawai'i. The State Department of Agriculture *Agricultural Lands of Importance to the State of Hawai'i* (ALISH) system of defining agricultural suitability has not classified the property according to its rating system (Figure 12). Most of the property is delineated within the existing urban development boundary, therefore, there are no soils classified as "prime agricultural land" or "other important agricultural land".

Potential Impacts and Mitigative Measures

The environmental factors of the site limiting its agricultural potential are primarily the soils and steep slopes. Rainfall in the project area is sufficient for soil based agricultural crops, however, there are other areas within O'ahu and in the State where soil conditions are better suited for commercial agriculture, compared to the project site.

A soils study for the project is currently being prepared by the soils engineer. Preliminary findings indicate that from a geotechnical viewpoint, the site is generally suitable for development. Slide potential throughout most of the site is low as the area is covered by only a thin layer of silty clay overlying weathered rock and weathered volcanic cinder strata. In the lower sections of the site, the surface layer of silty clay is thicker and mixed with numerous cobbles and boulders. The stability of slopes planned in the lower section of the site is being evaluated as part of the soils study, and if necessary, mitigative measures to reduce the potential for sliding will be included in the construction plans. The soils study will be submitted to the Department of Public Works and all grading activities will be approved by the City prior to construction.

Ka'ena very stony clay (KanE) at this location is characterized by its shallow nature in the upper areas and underlain by rock. Due to the grading proposed, most of the buildings on the uphill side of the road will be built on the underlying rock, while on the lower side of the road, foundations will be founded on select granular material. The problems experienced at Mānoa and Pālolo in recent years are not comparable to the subject site because of the differences in the thickness of the silty clay layer.

4.1.4 Drainage

A Preliminary Drainage Report has been prepared (Sato & Associates 1998) and is attached as Appendix A. The report includes a description of the existing drainage conditions at the project site and the proposed improvements. Kanahā Stream has an existing Peak Flow of 1,350 cubic feet per second (cfs).

No flood boundaries have been designated on the Flood Insurance Rate Map (FIRM) (Figure 13) for the project area although a few DHHL lessees on the opposite bank of the project site have reported erosion problems along their properties adjacent to Kanahā Stream. A visual inspection of Kanahā Stream indicated there is an accumulation of vegetation and other debris along the stream bed.

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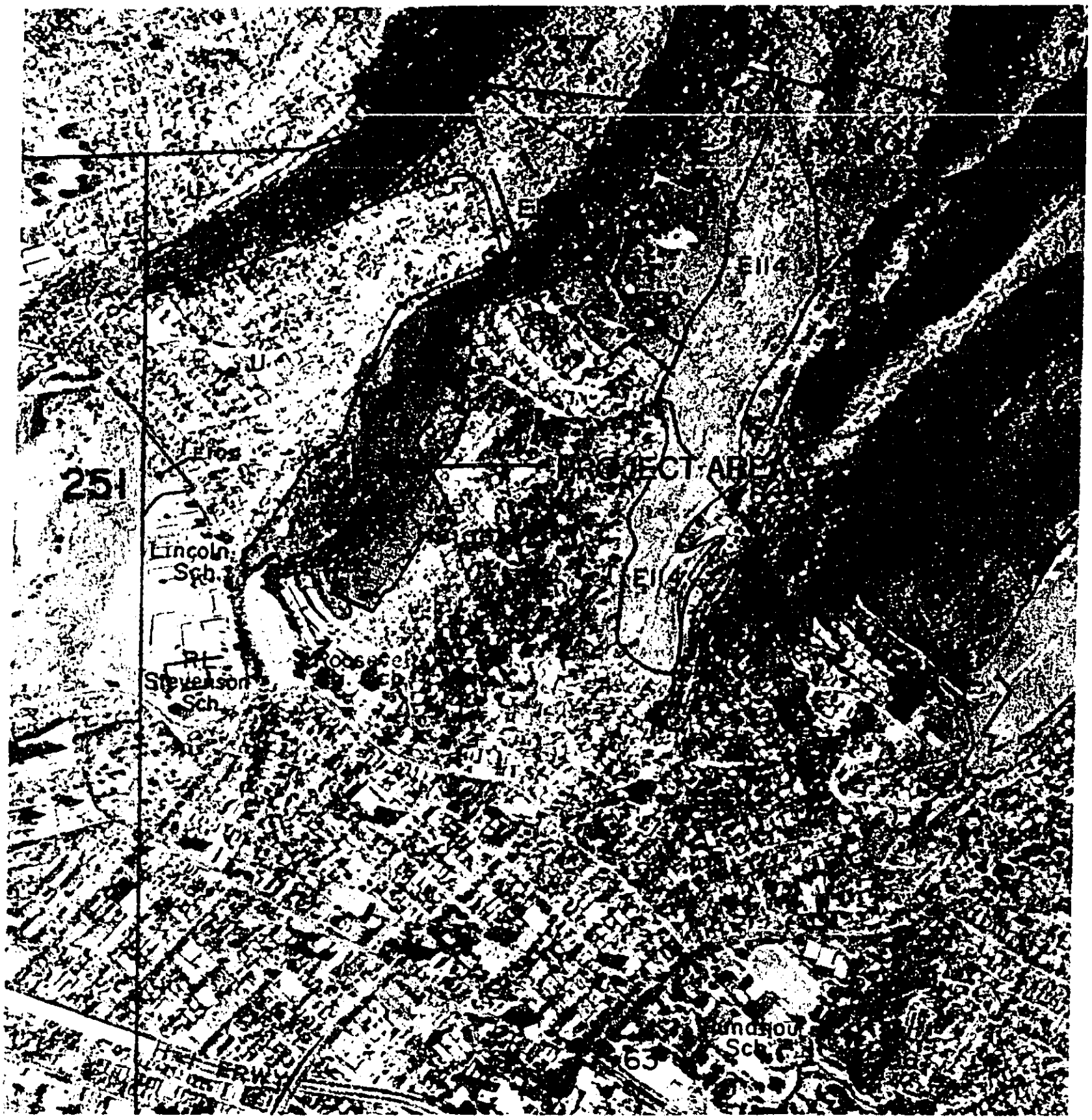

FIGURE 11
Detailed Land Classification
KALĀWAHINE STREAMSIDE

Source: Land Study Bureau, University of Hawai'i
State of Hawai'i, May 1972

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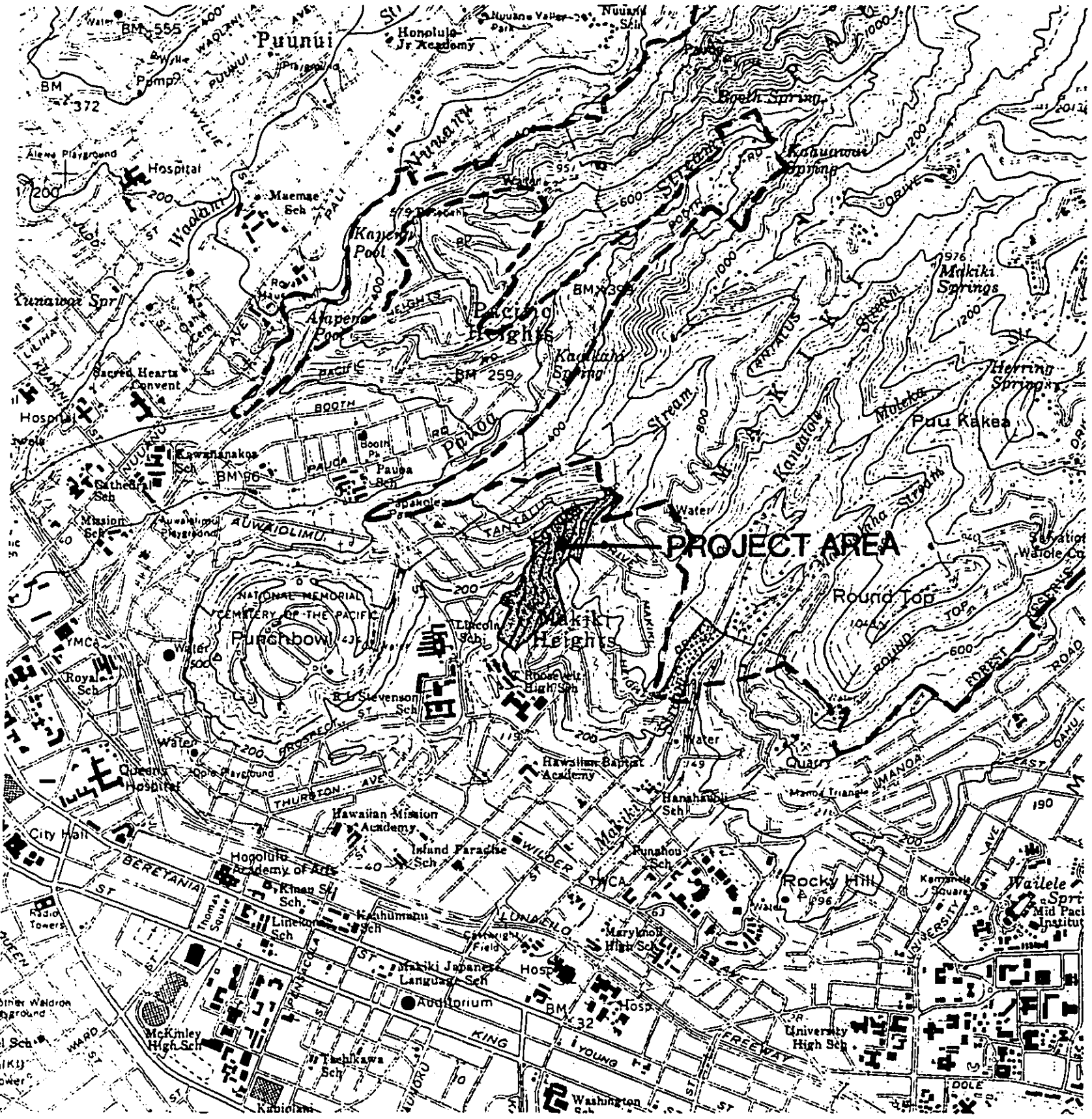

LEGEND

- Prime Agricultural Land
- Other Important Agricultural Land
- Existing Urban Development

Source: Department of Agriculture-State of Hawai'i, January 1977

FIGURE 12

Agricultural Lands of Importance to the State of Hawai'i (ALISH)

KALĀWAHINE STREAMSIDE

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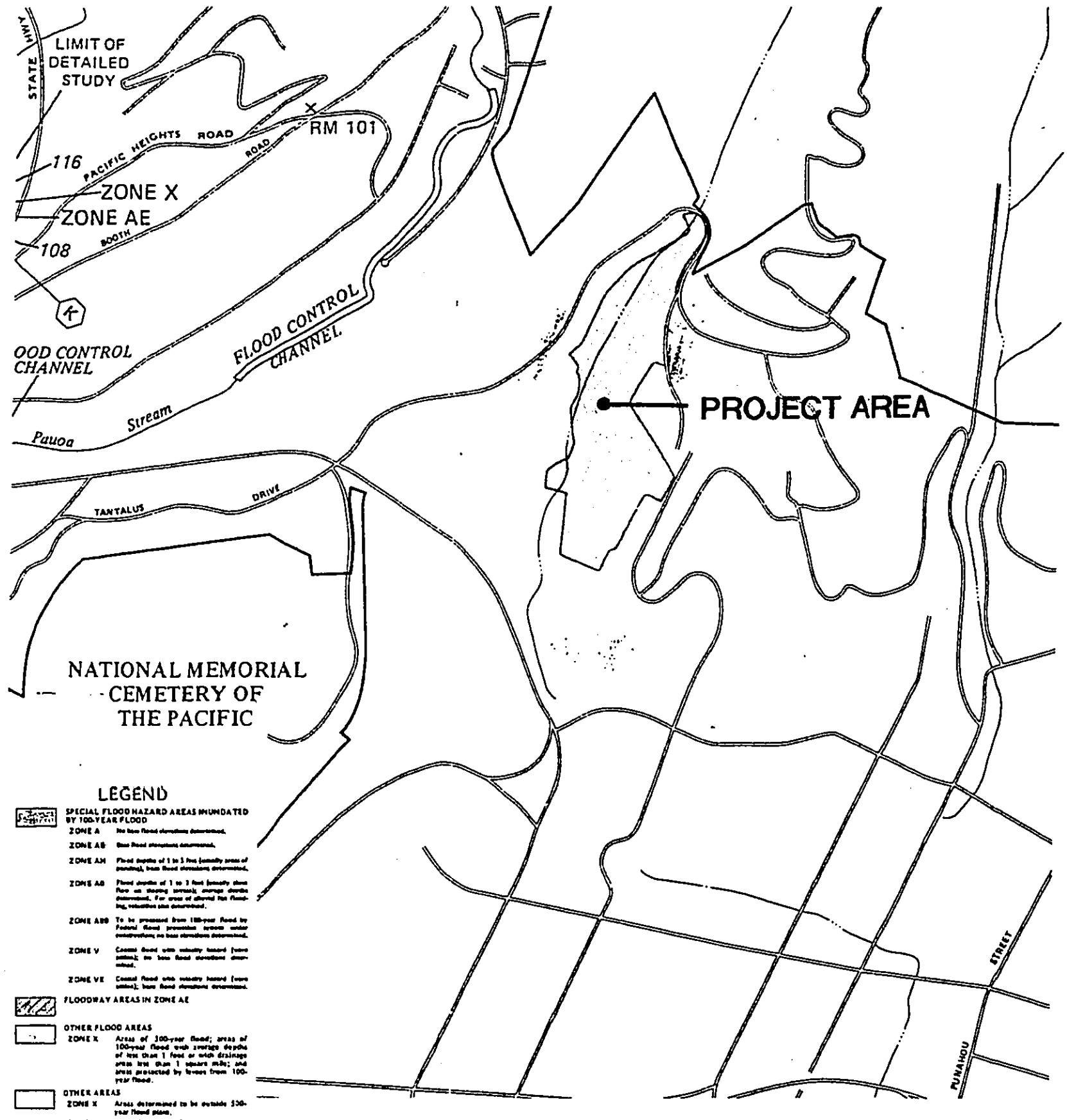

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A — No base flood elevations determined.

ZONE AE — Base flood elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 — To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.

ZONE V — Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X — Areas determined to be outside 500-year flood plain.

ZONE D — Areas in which flood hazards are undetermined.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM7X — Elevation Reference Mark

*Referenced to the National Geodetic Vertical Datum of 1929

FIGURE 13
Flood Insurance Rate Map
KALĀWAHINE STREAMSIDE

Source: National Flood Insurance Program, FEMA, Sept. 1987

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Further downstream, adjacent to Roosevelt High School, a large sized banyan tree was observed growing in the middle of the dry stream bed.

Potential Impacts and Mitigative Measures

The increase in runoff as a result of the Kalāwahine Streamside project is not expected to be significant, according to the Preliminary Drainage Report. The developed portion of the project will cover approximately 15 acres. Development will increase runoff into Kanahā Stream because impermeable surfaces will be increased. However, the effects of the project on the existing downstream improvements appear to be negligible. Based on a 50 year recurrence interval storm, the calculations indicate an estimated flow increase of 20.7 cfs. The increased flow is about 1.53 percent during peak flow conditions. Detention basins and other means of retaining runoff will be considered in the final design of the project to achieve no net increase in runoff.

The proposed alterations to the existing environment will be limited to cut and fill including grading and vegetation removal. Drainage patterns will not be altered. Flows which currently sheet flow will continue to flow to Kanahā Stream.

The on–site drainage system will consist of inlet boxes, drain manholes, reinforced concrete drain pipes and diversion swales. The drainage system will be in conformance with the City's Storm Drainage Standards.

The proposed improvements are based on methods outlined in Title MC–15, Department of Public Works and Waste Management, Subtitle 01, Chapter 4. The existing Peak Flow of 1,350 cubic feet per second (cfs) will be increased by about 20.7 cfs. The drainage system for the proposed development will be designed to increase the "time of concentration" to reduce the storm water flow rate into Kanahā Stream. The increase in runoff of approximately 1.53 percent will be detained on site and released to Kanahā Stream at the current rates and is not expected to have any adverse effects on the neighboring areas and the downstream facilities. Where feasible and practical, storm flows will be directed towards landscape areas to further reduce flows into Kanahā Stream.

Access to the project will cross over Kanahā Stream through an extension of Kapahu Street in the Kewalo area by way of a box culvert. The 9–feet by 14–feet box culvert will be designed such that the calculated existing water surface elevation will not be increased during peak flow conditions.

Detailed site specific measures for erosion and sediment control will be specified in the grading plans. The contractor will use silt fences around the perimeter of the construction area and siltation basins to prevent the silt laden runoff from leaving the site.

4.1.5 Natural Hazards

As described above, flood hazards are primarily identified by the Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (FEMA), National Flood Insurance Program. Although flood zones at the subject property are not designated on the FIRM, the proposed development will be constructed outside of the Peak Flow water surface limits.

The Hawaiian islands are associated with volcanic eruption or tectonic movement. All structures will be constructed for protection from earthquakes in accordance with the Uniform Building Codes adopted by the City and County of Honolulu.

The State of Hawai'i has been affected twice in the recent years by devastating hurricanes, 'Iwa in 1982 and 'Iniki in 1992. While it is difficult to predict these natural occurrences it is reasonable to assume that future events could be likely given the recent record. The project area, as the rest of the island or state, is no more or less vulnerable to the destructive winds and torrential rains associated with hurricanes and cyclones. Two schools, Roosevelt High School and Stevenson Intermediate School, in the immediate area of the project are designated as Emergency Evacuation Centers for this part of Honolulu.

Impacts and Mitigation Measures

The project will not exacerbate any hazard conditions. Planning and design for the project will implement the following measures to mitigate any potential damages.

Protection of Buildings. The potential impact of destructive winds and torrential rainfall of tropical hurricane and cyclones on structures within the project will be mitigated by compliance with the Uniform Building Code adopted by the City and County of Honolulu. All structures will be constructed for protection from earthquakes and tropical hurricanes and cyclones in accordance with the requirements of the City and County of Honolulu.

Drainage Improvements. Drainage improvement will include a box drain, catch basins, drain inlets, drain manholes, reinforced concrete pipes, diversion swales, and outlets. The drainage system will be designed in conformance with the City's Storm Drainage Standards, and submitted to the City for review and approval.

4.1.6 Underground Injection Control

The project is located mauka of the underground injection control (UIC) line which is located at the H–1 Freeway and Pali Highway.

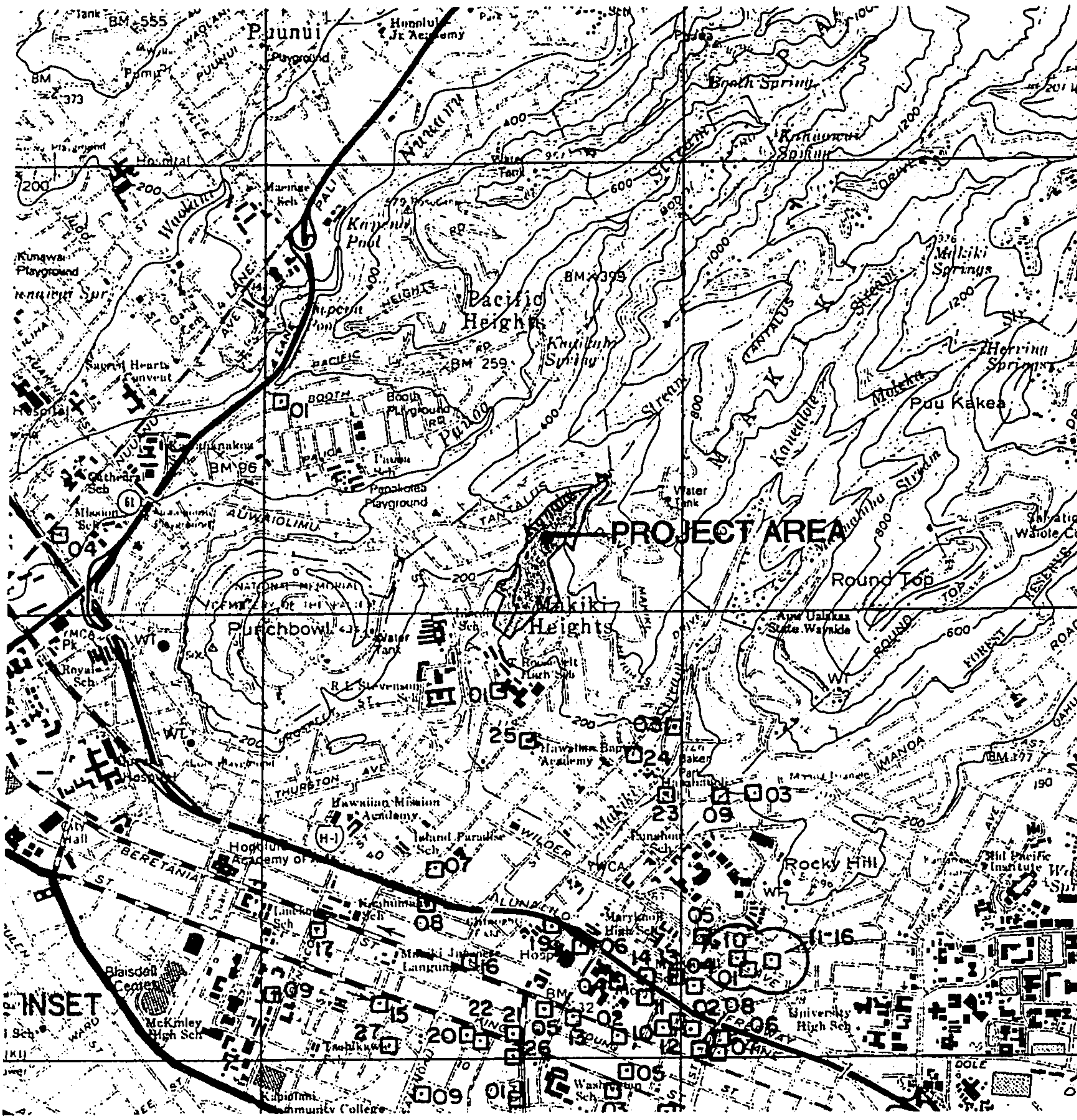
Potential Impacts and Mitigative Measures

The project's location above the UIC line requires that the subsurface disposal of fluids be subject to the Department of Health's UIC regulations, Title 11, Chapter 23, Hawai'i Administrative Rules (Figure 14). The project will comply with all DOH rules.

4.1.7 Flora and Fauna

Botanical Resources. A field study to assess the botanical resources at the project site was undertaken by Kenneth M. Nagata. The primary objectives of the survey were to describe the major vegetation types, inventory the flora, search for threatened and endangered plants, and identify areas of potential environmental concern. The botanical survey report is attached as Appendix B.

The vegetation in the region (e.g., from the off–site lower elevation project site to the upper elevation forests) has been described as one of mixed open forest and shrubs. The natural flora in



LEGEND

Underground Injection Control (UIC) Line

Injection Well

Drinking Source

Other Well

Source: Underground Injection Control Program Map
Department of Health, State of Hawai'i, July 1984

FIGURE 14
Underground Injection Control

KALĀWAHINE STREAMSIDE

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this region consists of open stands of guava (*Psidium guajava*) and koa–haole (*Leucaena leucocephala*) and grasses. Lantana (*Lantana camara*) is widely distributed and smaller shrubs such as false vervain (*Stachytarpheta dichotoma*) and Spanish clover (*Desmodium sandwicense*) are locally abundant. Bermuda grass (*Cynodon dactylon*) is the most abundant grass but pilipili'ula (*Chrysopogon aciculatus*), yellow foxtail (*Setaria gracilis*) and natal redtop (*Rhynchelytrum repens*) are also common in some areas. Forest trees such as koa (*Acacia koa*) and 'ōhi'a lehua (*Metrosideros polymorpha*) become more abundant in the higher elevations of the zone and guava and lantana become less prominent.

The vegetation of the subject Kalāwahine Streamside site is a mosaic consisting of small elements of closed–canopied forests, grasslands and thickets. A closed–canopied mixed forest 30 to 50 feet high consisting mostly of monkeypod (*Samanea saman*), Chinese banyan (*Ficus microcarpa*), silver oak (*Grevillea robusta*) and mango (*Magnifera indica*) is present along much of the gulch floor. Kukui (*Aleurites moluccana*) also occurs along the stream but only in the mauka portion near Tantalus Drive. The understory consists largely of Arabian coffee (*Coffea arabica*), Surinam cherry (*Eugenia uniflora*), white shrimp plant (*Justicia betonica*), rouge plant (*Rivina humilis*) and palm grass (*Setaria palmifolia*). In the makai portion 'opiuma (*Pithecellobium dulce*), be–still (*Casabela thevetia*) and koa–haole also occur in the mixed forest and white shrimp plant becomes dominant in the herb layer.

Small closed–canopied stands of silver oak, mango and Java plum (*Syzgium cumini*) 30 to 50 feet tall also occur in the small gully on the west facing slope. The understory in this area is dominated by white shrimp plant with moderate numbers of air plant (*Kalanchoe pinnata*) and rouge plant.

The vegetation along the slopes vary greatly. In the mauka portion of the site, the slopes and portions of the gulch floor are dominated by dense stands of Guinea grass (*Panicum maximum*) and palm grass 5 to 8 feet tall with small numbers of emergent silk oak, be–still, monkeypod and dead trees enshrouded by Madeira vine (*Anredera cordifolia*) and maile–pilau (*Paederia foetida*). A very large grove of bamboo (*Phyllostachys* sp.) and stands of Surinam cherry dominate the west facing slope in the middle portion of the gulch. The slopes in the makai section are characterized by mango, 'opiuma, silver oak and Java plum. 'Opiuma becomes very common in this portion of the site. When present the herb layer consists mainly of Guinea grass, palm grass, white shrimp plant or para grass (*Brachiaria mutica*).

No threatened or endangered species of concern were found during the survey. No sensitive native plant–dominated communities exist on the site. The vegetation on the site is a mosaic of forests, grasslands and thickets consisting entirely of alien (non–native) species with the exception of kukui. The Botanical Survey report concluded that the proposed project will have no impact on the integrity of the native flora.

Wildlife Resources. A field survey to assess the wildlife resources was conducted by Tim Ohashi; the survey report is attached as Appendix C.

The parcel is inhabited by introduced birds which are supported by the rich mixture of fruit trees and shrubs. The dominant species were the red–vented and red–whiskered bulbuls. Spotted doves and Japanese white eyes are also common. No native species were found on the site. The absence of any native trees would virtually preclude the use of the parcel by the more common native birds.

The parcel has suitable open habitat for pueo (*Asio flammeus*), which are predominantly diurnal or crepuscular, but none were observed on the parcel during the survey. The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) is often associated with lowland exotic vegetation, and may be active at dawn, but no bats were observed.

The following introduced birds were encountered during the survey. Ranked in order of abundance, they include:

Red–vented bulbul (*Pycnontus cafer*)
Red–whiskered bulbul (*Pycnontus jocosus*)
Japanese white–eye (*Zosterops japonicus*)
Zebra dove (*Geopelia striata*)
Spotted dove (*Streptopelia chinensis*)
Northern cardinal (*Cardinalis cardinalis*)
Japanese bush warbler (*Cettia diphone*)
House finch (*Carpodacus mexicanus*)
Red–billed leiothrix (*Leiothrix lutea*)
White–rumped shama (*Copsycus malabaricus*)

The small Indian mongoose (*Herpestes auropunctatus*), feral cats (*Felis cattus*), Norway rat (*Rattus norvegicus*) and roof rat (*Rattus rattus*) probably occur on the site. Because of the number of fruit trees and shrubs, it is possible that feral pigs (*Sus scrofa*) from the upper forest may visit the site during periods of abundant fruit. Domesticated goats (*Capra hircus*) owned by an off–site lessee are kept in pens on the project site.

The habitat is an introduced mixed forest with shrubs and herbaceous ground cover, typical of disturbed lowland vegetation along the leeward slopes of Honolulu. No native birds or the Hawaiian bat were found on the site. It is unlikely that the proposed development would impact any native species.

Stream Resources. Kanahā Stream is designated as an intermittent stream on the USGS topographic quad map. At the location of the project, Kanahā Stream is dry (except for periods of consistent rainfall) due to the sloped topographic conditions. Therefore, the Department of Land and Natural Resources Division of Aquatic Resources has determined that, at this location of Kanahā Stream, and generally, the stream area above 'Auwaiolimu Street, there are no in–stream biological resources.

Potential Impacts and Mitigative Measures

Botanical Resources. The proposed use of the parcel for the residential development should not have a significant negative impact on the botanical or wildlife resources. The vegetation at the site is dominated by introduced species. Introduced or alien species are all those plants brought to the islands by humans, intentionally or accidentally, after western contact, that is, Cook's arrival in 1778. The proposed project will have no impact on the integrity of the native flora.

Major existing large trees which are outside of the roadway and building areas, including monkey pod, kukui and banyan, will remain in place and be incorporated into the landscape plan. Monkeypod, banyan and mango trees will remain in the parkway system and streamside walkway.

In addition, the steeply sloped pali areas of the property consisting of 10 to 12 acres will not be disturbed and will remain in the current vegetated state.

- Site Landscaping: The project will be extensively landscaped with native and introduced plantings including large and medium canopy trees for planting along streets.

- Maintenance or Use of Existing Plantings: To the extent practicable the existing trees which presently grow on the property will be utilized in the landscaping of the project.

Wildlife Resources. While the short–term construction activities would likely disrupt the introduced birds that utilize the property, the surrounding landscape would more than adequately absorb the displaced birds until the end of construction. No negative impacts to native birds are anticipated since none occur at the site.

Stream Resources. Kanahā Stream is an intermittent stream at this location and no in–stream biological resources are present, therefore, there will be no impact to stream resources as a result of this project and no mitigation measures are necessary.

4.2 HUMAN ENVIRONMENT

4.2.1 Archaeological and Historic Resources

The Department of Land and Natural Resources State Historic Preservation Division (SHPD), at the request of the DHHL, conducted an archaeological inventory survey at the subject property in 1991. A report of the site investigations is attached as Appendix D.

No significant historic sites were found in the project area. All remains proved to be modern era (1930s to 1940s) house and agricultural ruins. Thus, the study concluded, that any use of the project area will have "no effect" on significant historic sites.

Pertinent findings of the SHPD survey include the following:

- Precontact to 1850s. Archival records from the early 1800s to 1850s indicate that Honolulu's permanent housing and major farming lots (kalo lo'i) were on the coastal shore and up the perennial streams in Nu'uanu Valley and Pauoa Valley. Twenty–five commoner Land Commission Awards (LCA) were awarded in Kalāwahine 'ili. All were clustered in the Foster Gardens area, and they included house lots, irrigated kalo fields and some dryland farm plots (kula). No claims were made for parcels within the mauka Kalāwahine piece proposed for the subject project. This area may have remained in forest land. This 1850s pattern is likely to approximate the pre–contact pattern, with fewer people living on the shore (as Honolulu was not then a capitol or royal center). Archaeological findings support this pattern for mauka Kalāwahine. No heiau were recorded in this are in the 1930s by the Bishop Museum. The SHPD survey found no precontact sites on the project site and general area.

- 1870s to 1900. Archival records show land sale activities focused on the coastal pieces of Kalāwahine, where all the housing, kalo fields, fishponds and fishing rights had existed. An 1873 survey record suggests that the mauka Kalāwahine land was forest land, providing forest resources for the 'ili. Maps of the 1870s show that Honolulu's growing settlement had not yet

expanded into the valleys of Punchbowl. By 1900, the city still was only makai of Punchbowl and in the mauka section of Kalāwahine. It is possible that around 1900 nearby small settlements may have begun to use these valleys for small scale agriculture, but no records have been found supporting this possibility. The SHPD survey found no archaeological sites dating to this period, tending to support the idea that this land had been forest land.

- 1900 to 1950. Archival records show that "squatters" had been living in mauka Kalāwahine since 1911. There seem to have been 30 or more different families living in the area. By 1935, there may have been about 240 people in the area. They had houses and small garden areas. In 1950, it appears that these people were forcibly relocated and bulldozers were used to clear the area of structures, trash, etc. The SHPD survey found five archaeological sites in the project area, all dating of this time period. These included small garden features, a few housing features, and considerable 20th century artifacts and debris.

SHPD concluded that it is highly unlikely that pre–1900 archaeological sites were present, and if they were, bulldozing in the 1950s is likely to have destroyed any such sites. Any development actions in the parcels should have "no effect" on significant historic sites. The State Historic Preservation Division letter is attached as Appendix D–1.

Burials in the Vicinity of the Project. The SHPD report noted that graves on the off–site Lot 3 in the vicinity of the project were made in oral testimonies; however, these graves were not identified during the 1993 survey. As a follow–up to the SHPD survey, Paul Cleghorn, Ph.D. of Pacific Legacy, in a February 1998 investigation for the subject project, has determined through community sources and a 1935 Hawaiian Homelands map that Lot 3 is located along the southeastern boundary of the project and is not within the project boundary. A search for possible graves of the approximate area of Lot 3 was made, however, none were found. Dr. Cleghorn noted that vegetation is thick in the area and if grave markers are low mounds, they could easily be missed. We note that graves may exist on Lot 3, however, Lot 3 is outside the project boundary. A letter report is attached as Appendix D–2.

Potential Impacts and Mitigative Measures

No significant historic sites were found in the project area. All remains proved to be modern era house and agricultural ruins. Thus, the State Historic Preservation Division has concluded any use of the project area will have "no effect" on significant historic sites. A recent search (1998) for burials has determined that reported graves in the vicinity of the project are likely to be located on Lot 3 which is not within the project boundary.

However, if any human skeletal material is inadvertently discovered during the course of land altering activities, construction activity in the immediate area of the find would be suspended and the State Historic Preservation Division would be contacted at 587–0047.

4.2.2 Roadways and Traffic

The proposed project would have vehicular access from a new extension of Kapahu Street where it currently Tees at Anianikū Street in the existing Kewalo neighborhood. The proposed project access would convert the existing T–intersection of Kapahu Street and Anianikū Street to a cross–intersection by adding a fourth (south) leg (described herein as "Kapahu Street Extension").

Existing traffic conditions and potential impacts of the Kalāwahine Streamside project have been analyzed by Julian Ng, Inc. and are described in this section.

Existing Conditions

Roadway System. A map of the roadways in the vicinity of the project is shown in Figure 15. Both Anianikū and Kapahu Streets intersect with 'Auwaiolimu Street, which is wide enough for four lanes, but is used as a two–lane roadway connecting the Makiki and Pauoa areas of Honolulu. Kapahu Street intersects 'Auwaiolimu Street in an unsignalized T–intersection; traffic on Kapahu Street must stop before entering 'Auwaiolimu Street. Anianikū Street intersects 'Auwaiolimu Street in a signalized cross–intersection. Opposite Anianikū Street is the Lincoln Elementary School driveway. The intersection of Kapahu and Anianikū Streets (where the project access road is proposed) is located approximately 650 feet east of 'Auwaiolimu Street along Anianikū Street and 570 feet along Kapahu Street.

Anianikū and Kapahu Streets are 28 feet wide between curbs with on–street parking permitted on both sides. When vehicles traveling in opposite directions meet, one must yield near a driveway or other area where no vehicle is parked. Na'ale Street, located between Anianikū and Kapahu Streets, is approximately 300 feet in length and is parallel to 'Auwaiolimu Street; it intersects Anianikū and Kapahu Streets approximately half way between 'Auwaiolimu Street and the project access. Traffic on Na'ale Street stops before entering the other streets.

Traffic Conditions. Traffic volumes at the intersection of Anianikū and Kapahu Streets were measured in August 1994 by the City Department of Transportation Services. The data, however, are not complete and counts of overnight traffic volumes were not available. Table 2 shows the data that are available:

TABLE 2
TRAFFIC VOLUMES (KEWALO NEIGHBORHOOD)

	Anianikū Street		Kapahu Street
Two–way traffic:	west leg	east leg	north leg
Weekday total	239 vpd	211 vpd	58 vpd
AM Peak Hour	19 vph	20 vph	20 vph
PM Peak Hour	23 vph	28 vph	0 vph

(vpd = vehicles per day, vph = vehicles per hour)
Source: City and County of Honolulu, Department of Transportation Services

Manual traffic counts were taken in April 1998 of traffic on Anianikū and Kapahu Streets during expected peak periods. Counts were taken in the morning between 6:45 AM and 7:15 AM, in the early afternoon at the end of the school day (2:15 PM to 3:00 PM), and during the afternoon peak period (4:00 PM to 6:00 PM). Table 3 summarizes the actual and estimated peak hourly volumes from these counts.

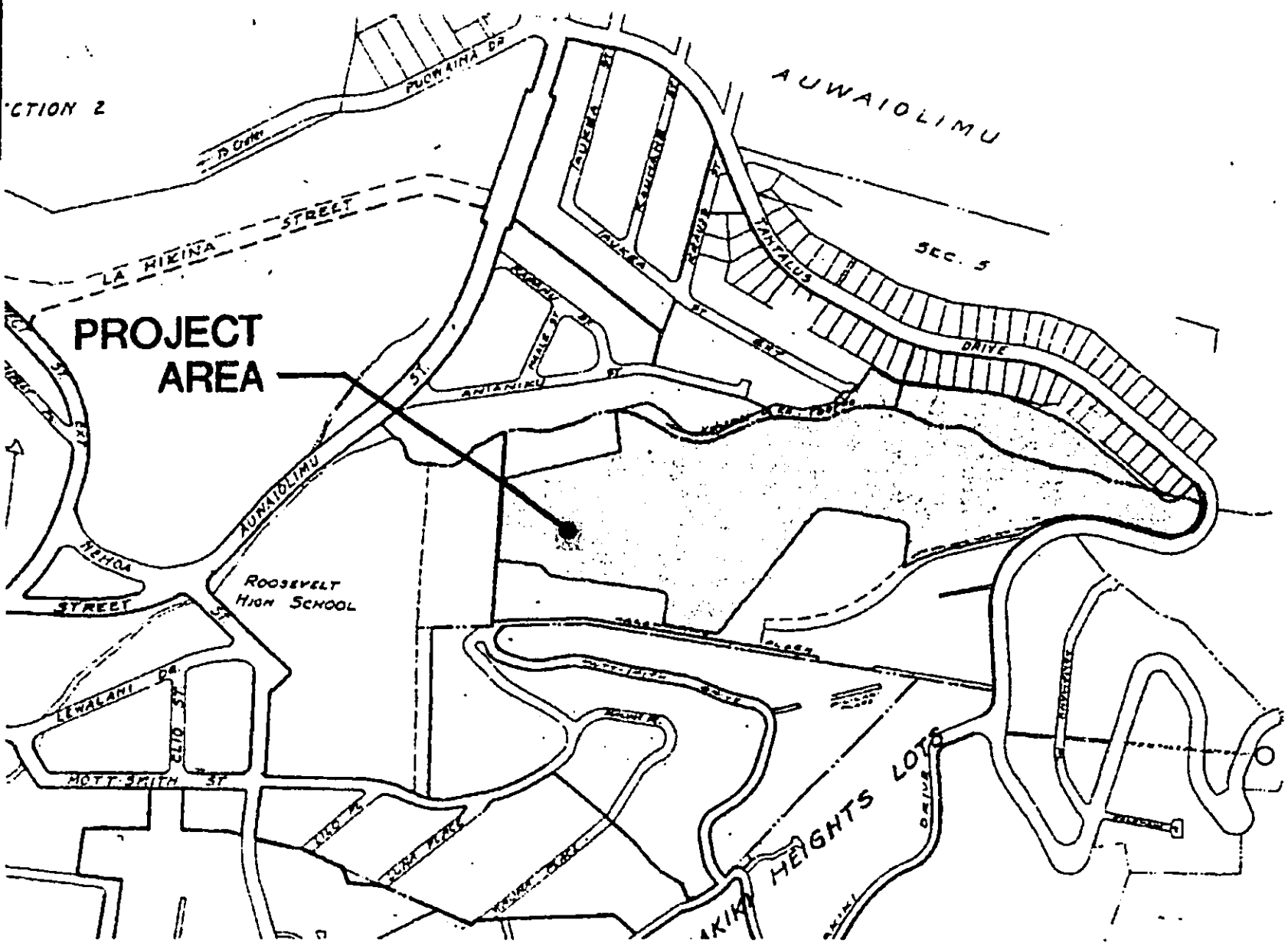

FIGURE 15
Roadways in the Project Area

KALĀWAHINE STREAMSIDE

Source: TMK Map [(1) 2-4]

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TABLE 3
TRAFFIC COUNTS, ANIANIKŪ AND KAPAHU STREETS

	Anianikū Street		Kapahu Street	
	In	Out	In	Out
7:15 AM – 8:15 AM (counted)	36	38	33	30
2:00 PM – 3:00 PM (estimated)	35	27	16	16
5:00 PM – 6:00 PM (counted)	16	22	17	14

The highest rate of traffic flow on any segment of Anianikū or Kapahu Streets is estimated to be 75 vehicles per hour (two–way total), or an average of one vehicle every 160 seconds in each direction. The probability that a vehicle traveling in the opposite direction will be met within a 650–foot block (e.g., on Anianikū between Kapahu Street and ʻAuwaiolimu Street) is about one–fourth of the time. If a delay of 15 seconds is incurred each time an opposing vehicle is encountered, the existing average delay per vehicle would be 4.0 seconds.

Traffic leaving the Kewalo area would also incur delays while entering ʻAuwaiolimu Street. The greatest delay is expected in the morning peak hour, when the highest volume of traffic leaving the site would occur. This period coincides with the highest volumes on ʻAuwaiolimu Street, with the worst conditions occurring in the 15–minute period before school starts. Table 4 presents traffic count data for ʻAuwaiolimu Street near the intersection of Nehoa Street.

TABLE 4
TRAFFIC VOLUMES, ʻAUWAIOLIMU STREET NORTH OF NEHOA STREET

Directional traffic:	south bound	north bound
May 13, 1993 (Thursday)	6,980 vpd	na
AM Peak Hour (7:00–8:00 AM)	1,165 vph	na
PM Peak Hour (4:30–5:30 PM)	624 vph	na
September 15, 1987 (Tuesday)	6,909 vpd	5,573 vpd
AM Peak Hour (7:00–8:00 AM)	1,127 vph	686 vph
PM Peak Hour (4:30–5:30 PM)	634 vph	560 vph

(vpd = vehicles per day, vph = vehicles per hour, na = not available)
Source: City and County of Honolulu, Department of Transportation Services

These counts, taken six years apart, indicate very little growth in traffic volumes on the southbound (makai bound) ʻAuwaiolimu Street. Traffic volume on ʻAuwaiolimu Street in 1998 are expected to be similar to those counted earlier.

Manual counts of turning movements and observations of signal timing at the intersection of ʻAuwaiolimu Street and the Lincoln School driveway during the morning peak period in February, 1998, along with the April, 1998 field counts of peak hour traffic on Anianikū and Kapahu Streets were used to estimate peak hourly traffic volumes at the existing signalized intersection. The counted volume, when converted to an effective flow rate, indicate that congested conditions occur only on the ʻAuwaiolimu Street approaches. Table 5 summarizes the existing conditions at this intersection.

TABLE 5
EXISTING CONDITIONS, 'AUWAIOLIMU AND ANIANIKŪ STREETS
(AM PEAK HOUR)

Approach	Lincoln School eastbound	'Auwaiolimu Street southbound	'Auwaiolimu Street northbound	Anianikū Street westbound
estimated total traffic (vph)	220	930	685	40
green/cycle time	28%	56%	61%	28%
vehicles per hour of green	792	1,674	1,121	143

(vph = vehicles per hour)

As a comparison with the "vehicles per hour of green" indicated in Table 5, capacity level under ideal conditions (i.e., no pedestrian or vehicular conflicts) would be approximately 1,700 vehicles per hour of green per lane of traffic. For existing conditions at the intersection, with pedestrian conflicts and left turns, capacity values would be approximately 1,200 vehicles per hour of green per lane. The results shown in Table 5 confirm observations made in the field: traffic often used two lanes to cross the intersection on 'Auwaiolimu Street during the peak period.

Potential Impact of Project

The proposed project will increase traffic in the area by adding 95 dwelling units, an increase of more than 200 percent over the existing 47 lots in the Kewalo subdivision served by Anianikū and Kapahu Streets. Traffic generated by the proposed project would generally use Anianikū Street between 'Auwaiolimu Street and the project's Kapahu Street Extension access road. Kapahu Street, which would provide an alternative route to 'Auwaiolimu Street, would be the preferred route for any traffic to or from the mauka (Pauoa) direction. Using average trip generation rates[1] for single family detached dwellings, the estimated traffic volumes generated by the proposed project are shown in Table 6.

TABLE 6
PROJECT TRAFFIC GENERATION

	Average Weekday Traffic	AM Peak Hour	PM Peak Hour
Based on number of dwelling units			
Entering project	470 vpd	19 vph	63 vph
Exiting project	470 vpd	56 vph	36 vph
Based on number of residents (assuming 5.5 persons/unit)			
Entering project	680 vpd	35 vph	99 vph
Exiting project	680 vpd	77 vph	51 vph

(vpd = vehicles per day, vph = vehicles per hour)

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[1] Institute of Transportation Engineers, *Trip Generation, 6th Edition.* Washington, D.C., 1997.

The greatest traffic impact of the project would be 99 vehicles per hour in the peak direction. An estimated 80 percent of the traffic generated by the project would travel to or from the makai direction on 'Auwaiolimu Street. Traffic impact on 'Auwaiolimu Street would be less than 100 vehicles per hour in both directions. The project impact is not expected to be significant. The increase in traffic, even on a worst–case basis, would be less than the "100 added vehicle trips in the peak direction (inbound or outbound) during the site's peak traffic hour"[2] that the Institute of Transportation Engineers has suggested as a criteria for a site traffic impact access or impact study.

Concerns about added traffic in the Kewalo neighborhood, however, have been expressed. The existing narrow streets have parallel parking on both sides of the street; the remaining roadway is wide enough only for one lane of traffic. Under existing conditions, when two vehicles traveling in opposite directions wish to use the same segment of street, one driver must yield by pulling over wherever possible to let the other pass. The average peak hour delay due to this constraint has been estimated to be 4.0 seconds per vehicle on Anianikū Street between 'Auwaiolimu Street and Kapahu Street. With the projected increase in traffic volume, the peak hour delay on the same street segment with the addition of project traffic has been estimated to increase to 9.2 seconds. Peak traffic conditions with the new project will more likely flow in the same direction, thereby, lessening the impact of vehicles traveling in opposite directions.

At the existing signalized intersection of 'Auwaiolimu Street and Anianikū Street, the increased traffic is not expected to have a significant impact since the peak morning flow out of the neighborhood will be using the generally underutilized Anianikū Street approach, as illustrated in Table 7.

TABLE 7
CONDITIONS WITH PROJECT TRAFFIC, 'AUWAIOLIMU AND ANIANIKŪ STREETS

Approach	Lincoln School eastbound	'Auwaiolimu Street southbound	'Auwaiolimu Street northbound	Anianikū Street westbound
estimated total traffic	225	930	690	120
green/cycle time	28%	56%	61%	28%
vehicles per hour of green	804	1,674	1,131	429

(1,200 vehicles per hour of green would be considered capacity)

During the afternoon peak hour when the peak flow enters the project, traffic volumes on 'Auwaiolimu Street are less. Entering traffic will mostly be right turns, which will have minimal effect on traffic conditions. The impact to 'Auwaiolimu Street will be less than 100 vehicles per hour during the peak hour.

Within the Kewalo neighborhood, while the volume of traffic due to the proposed project will be a proportionately large increase (100 vehicles per hour), the existing streets, although narrow, should be able to accommodate the increased traffic even during peak hours without significantly increasing delays.

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[2] Institute of Transportation Engineers, *Traffic Access and Impact Studies for Site Development, A Recommended Practice*. Washington, D.C., 1991.

Potential Mitigation Measures

No mitigation measures are recommended for the existing streets since the potential traffic impacts of the project are minimal. Street parking within the existing Kewalo Community will not be changed, nor will there be any recommendation for reduced street parking or garage construction. If, however, traffic conditions after completion and full occupancy of the project are unacceptable to the residents residing on the affected streets (Anianikū, Kapahu, and Na'ale), a possible mitigation measure would be the implementation of a one–way street system.

One–way Street System. Under this alternative, Kapahu Street would be converted to one–way operation, serving traffic entering the neighborhood, from 'Auwaiolimu Street to Anianikū Street. Anianikū Street, between Kapahu and 'Auwaiolimu Streets, would be one–way, serving exiting traffic.

Conversion to one–way operation would eliminate the situation in which vehicles traveling in opposite directions will meet each other on the one lane that is available for traffic. However, the one–way operation will result in some inconveniences to all residents of the neighborhood.

The Kalāwahine Streamside Master Plan makes the following provisions:

- On–Site Project Parking. Parking for residents of Kalāwahine Streamside and their guests will be accommodated within the project site.

- Stop Controlled Exit at Kapahu Street. Traffic exiting from the project at the extended Kapahu and Anianikū Street intersection would be stop controlled before entering Anianikū Street.

4.2.3 Noise

The narrow project site is surrounded by existing residences in the DHHL Kewalo Papakōlea Residence Lots to the west and a steeply sloped pali abutting Tantalus Drive and Kalāwahine Place residences to the east. The existing background ambient noise levels result from the natural sounds of wind, foliage and birds, as well as intermittent aircraft and vehicular traffic.

Potential Impacts and Mitigative Measures

It is not anticipated that on–going noise generated from the project's residential land use will exceed acceptable levels. During the construction phase, there will be noise impacts generated from short–term construction activity. Construction noise is typical of development projects and do not warrant additional mitigation measures. Noise associated with the operation of the project will be mitigated through landscaping, building siting and design in accordance with the City and County of Honolulu and Department of Health requirements.

4.2.4 Air Quality

Both Federal and State standards have been established to control ambient air quality. At present, six parameters are regulated, including the following: 1) particulate matter; 2) sulphur dioxide; 3) nitrogen dioxide; 4) carbon monoxide; 5) ozone; and 6) lead. Hawai'i's standards are more stringent than comparable national limits except for sulphur dioxide. Regional and local climate, together

with the type and amount of human activity, generally dictate the air quality at a given location. Present air quality is estimated to be good; this is primarily due to the predominant northeast trade winds.

Potential Impacts and Mitigative Measures

Construction of the proposed project will not significantly impact air quality. Vehicular emissions will increase from construction equipment during the short–term construction period and over the long–term from passenger vehicles. However, State and Federal air quality standards will not be exceeded and no significant adverse impacts are anticipated.

Mitigation measures available to minimize air quality impacts include dust control measures such as frequent watering during construction and rapid establishment of plant materials once grading is completed. However, should dirt be tracked onto area roadways, washdown will be undertaken to prevent fugitive dust formation. Increased vehicular traffic will not violate state or federal air quality standards based on the moderate level of existing traffic volumes in the project region.

4.2.5 Visual Resources

The project site occupies approximately 15 acres of a 26.5–acre property. Portions of the site are visible from Tantalus Drive, from the adjacent residences in the Papakōlea Residence Lots, and from roadways within the Residence Lots including 'Iaukea, Anianikū, Kapahu and Na'ale Streets. A portion of the project site is also visible from the Punchbowl National Memorial Cemetery of the Pacific visitor lookout; however, only a few homes along the southern portion of the project where the slopes are buildable will be visible. The public views of the proposed homes will be against a backdrop of green vegetation which covers the steep slopes.

Panoramic views which are available from within the project extend to Punchbowl and the nearby downtown Honolulu skyline. Views of the adjacent Papakōlea Residence Lots are also available from the project. Photographs of the project site are shown in Figures 16A, 16B, 16C and views from the Punchbowl Cemetery lookout of the project site are shown in Figure 16D.

Potential Impacts and Mitigative Measures

The proposed project is a single family and duplex residential project. Views from the project of Punchbowl and the downtown skyline are available from portions of the property. Most of the site, however, will face the adjacent Papakōlea homesteads.

Visually, the single–family and duplex dwellings will be designed to integrate into the existing DHHL residential homesteads immediately surrounding the area. Like most of the homes in the area, the Kalāwahine Streamside homes will be similarly built within the hillside. Steep slopes will remain in the natural vegetated condition. The new homes at the project will be visually cohesive by the quality building materials such as Arch 80 asphalt fiberglass strip shingles and a coordinated color palette which will range in earth tones. In addition, existing large trees will remain along the park walkway system along Kanāha Stream (to the extent practicable) and new street trees will be planted.

1. Typical view of the property.

2. View towards downtown Honolulu.

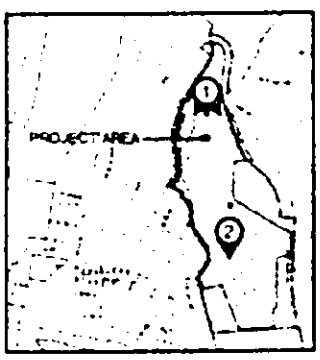


FIGURE 16A
Site Photographs
KALĀWAHINE STREAMSIDE

0000 0026 2772

3. View of the property overlooking the Kewalo area of the Papakōlea Residence Lots with Punchbowl National Cemetery of the Pacific in the distance.

4. View of the property; looking towards Papakōlea Residence Lots.

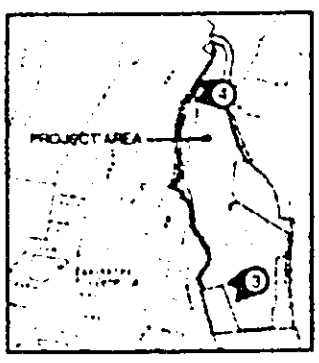
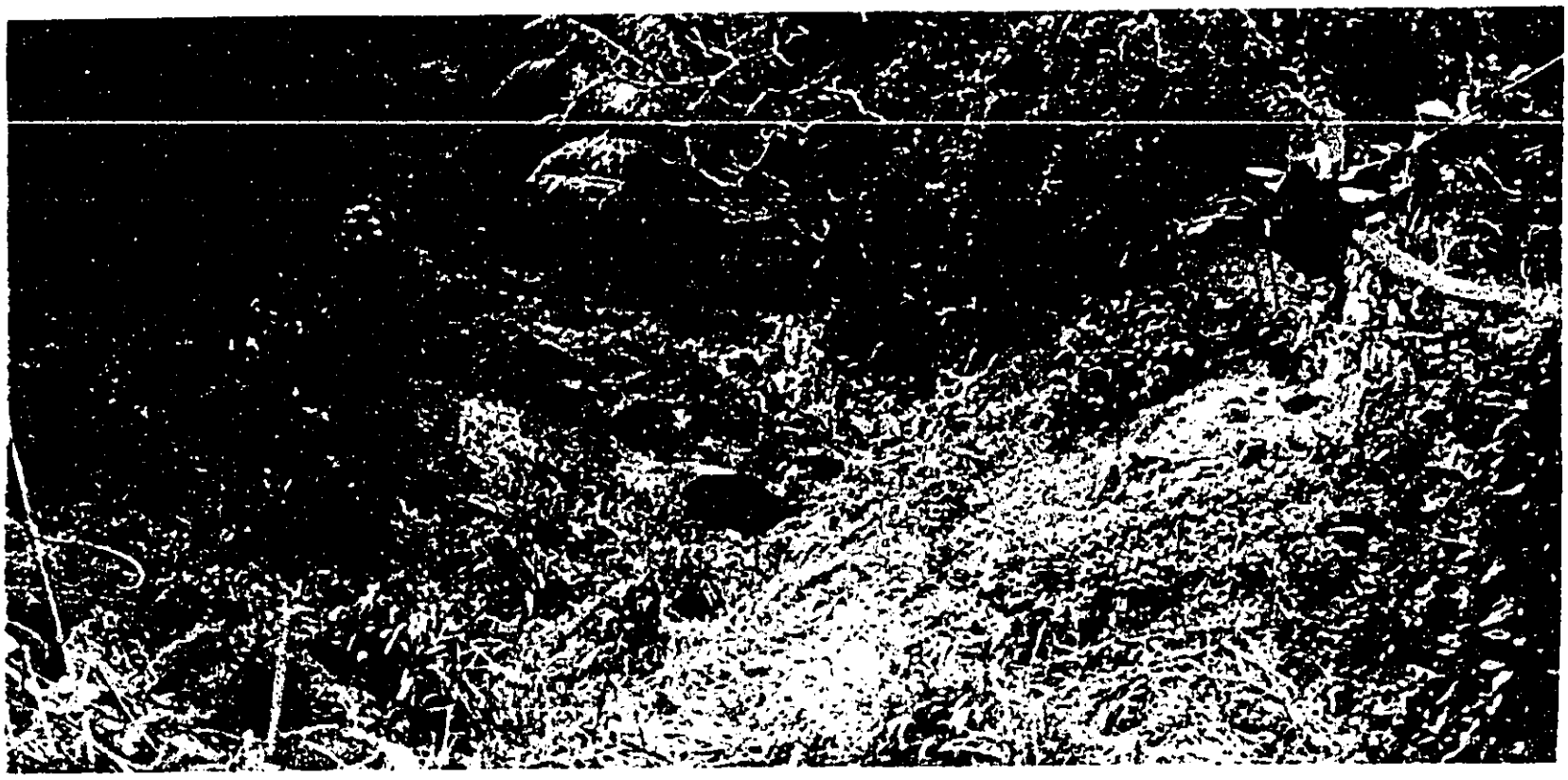
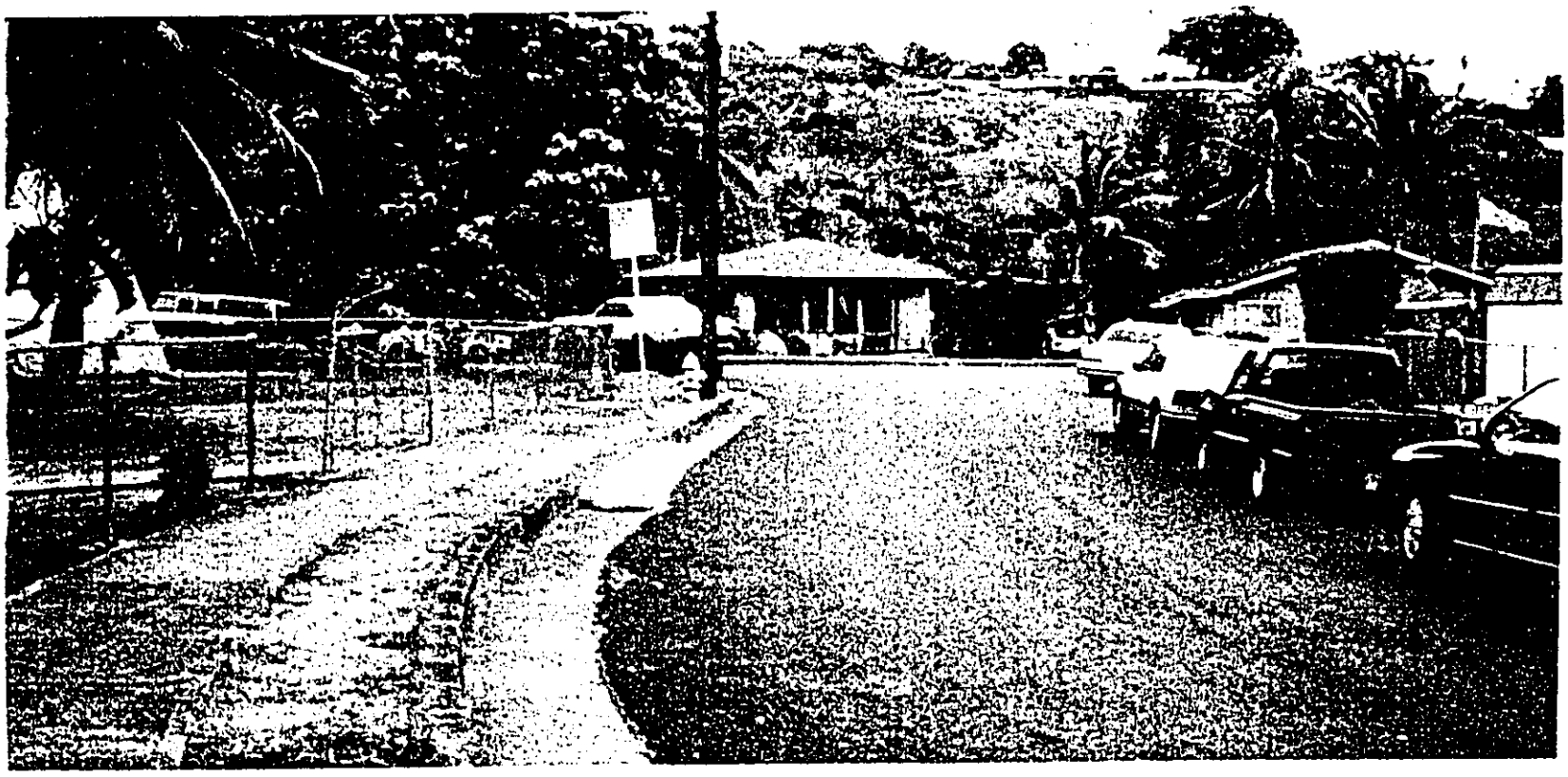


FIGURE 16B
Site Photographs
KALĀWAHINE STREAMSIDE

0000 0026 2773



5. View of Kanaha Stream on the property (near 'Iaukea Street).



6. Off-site view of the property (in the background) from Kapahu Street near the intersection of Anianiku and Kapahu Streets, location of the proposed project access roadway.

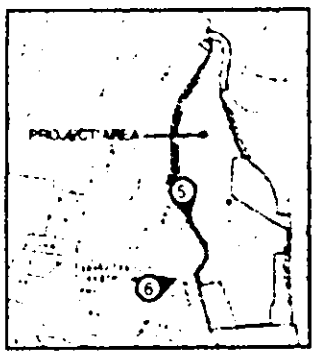
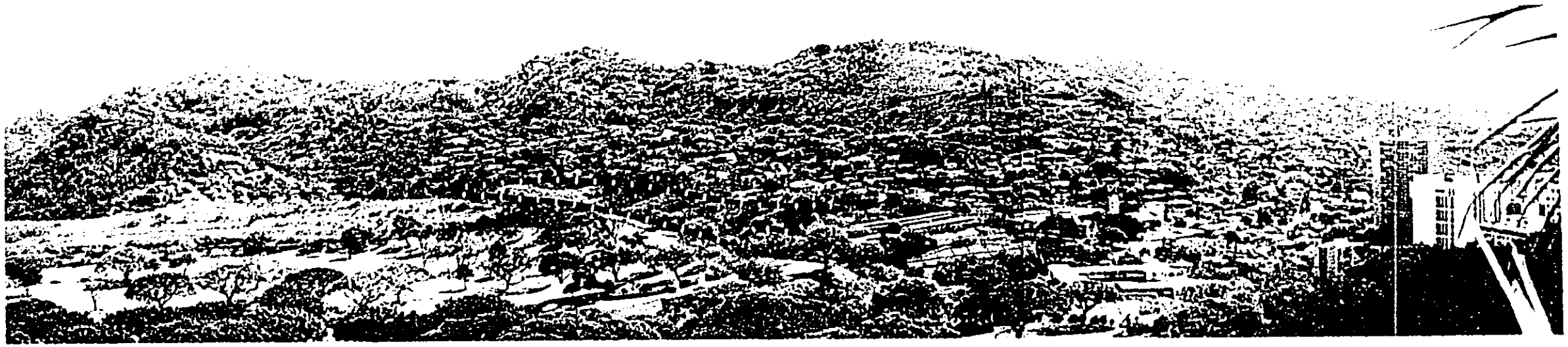


FIGURE 16C
Site Photographs
KALĀWAHINE STREAMSIDE



7. View of the Kaläwahine Streamside site from the Punchbowl National Memorial Cemetery visitor lookout.

LEGEND

Poject Area

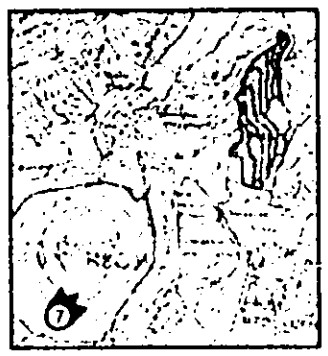


FIGURE 16D
View of Project Area from
Punchbowl Cemetery Visitor Lookout

KALÄWAHINE STREAMSIDE

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4.2.6 Social and Employment Characteristics

Population. According to the latest census information (1990), Census Tract 44, which includes Pauoa, the surrounding Papakōlea Residence Lots, and the project area had a population of 5,429 in 1990. This is a five percent decline from the 1980 population of 5,724 people and a 12 percent decline since 1970 population of 6,142. At the Papakōlea Residence Lots homesteads, the population in 1990 was 1,768.

The average household size on Hawaiian Home Lands residential lots is generally higher than the overall population. The term household size refers to the average number of persons living in an occupied dwelling within a given area. According to the Profiles of Study Areas Within The Hawaiian Home Lands census report (Alu Like 1993), the average household size on HHL ranged from 3.41 to 5.5 persons per household. At the Papakōlea Study Area (Alu Like 1993) which includes the Papakōlea Residence Lots, the average household size was 4.79. By contrast, the average household size of Census Tract 44 in 1990 (which includes the Papakōlea Residence Lots) was 3.41, which was higher than the overall general O'ahu population with an average household size of 3.02. Within Census Tract 44, the average household size has varied since 1970. For example in 1990, the average household size was 3.41 persons compared to 3.55 in 1980 and 4.27 in 1970.

Housing. As indicated in Section 1.4, the existing need for additional DHHL residential homesteads on O'ahu is significant. There are presently 6,014 qualified native Hawaiians who are on the wait–list, of which 121 are from the immediate area of the proposed project. Whereas, residential homestead development in rural O'ahu has accommodated many on the wait–list, there is a segment of the qualified applicants who desire homes in urban Honolulu. Urban homesteads have not been available since the 1950s.

Employment. Papakōlea is a residential suburb of downtown Honolulu with no employment center other than the elementary school; consequently, working residents are generally employed outside of the community. The present status of the subject lands is vacant, consequently no employment opportunities are associated with the property. Within the nearby area, residential uses predominate and employment is limited to government service (e.g., schools and national park service) and other home–based businesses. Most who reside in the area are employed in nearby employment centers in the primary urban center and beyond. As such, the populated neighborhoods in the area, provide a workforce for the nearby employment centers.

Re–location of One Existing Household. The construction of the proposed project access roadway by extending Kapahu Street will require re–location of one existing DHHL lessee (TMK: 2–4–42: 37). Presently the homestead is occupied by a resident.

Potential Impacts and Mitigative Measures

Population. The range of average household size from 4.79 (Papakōlea Study Area) and 5.5 (HHL high range) was used to estimate the population for the project. It is anticipated that the 95 Kalāwahine Streamside homes will add between 455 to 523 people to the area. This is in contrast to the approximately 324 people who might be expected with an average household size of 3.41 which is more typical of Census Tract 44. The local infrastructure capacity levels is not expected

to be exceeded with the additional population. All studies (i.e., roads, water, sewer, schools) have used the highest average household size (5.5 persons) to assess the impacts.

Housing. The provision of new housing units at Kalāwahine Streamside will increase the housing choices for native Hawaiians who are wait–listed for Hawaiian Home Lands residential homesteads. The greatest demand for homesteads on O'ahu are residential homesteads. This urban Honolulu project is unique for its convenient location to the primary urban center. DHHL is anticipating the development of new homes at Kapolei, Wai'anae and Nānākuli, however, the proposed Kalāwahine Streamside homes are the only offering in urban Honolulu.

Employment. The development of the project will provide short–term employment opportunities. Positive social impacts from construction related employment will result from the proposed project.

Re–location of One Existing Household. Relocation is permitted for road or public access under the terms of a DHHL lease. At a minimum, the existing lessee will be compensated based upon statutory relocation requirements and a property appraisal. Discussions with the lessee at TMK: 2–4–42:37 involve the possible re–location to Kalāwahine Streamside. Re–location terms to be negotiated would include a discounted home price and temporary lodging expenses. A resolution will be reached through discussions between the developer, DHHL, and the lessee.

4.2.7 Economic Factors/Government Revenues

Public Costs or Revenues. The current vacant status of the property does not result in any public costs or revenues.

Potential Impacts and Mitigative Measures

DHHL and the developer of the project, Kamehameha Investment Corporation (KIC), would expend internal and other funds to construct the project and commit 26.5 acres of land toward the project. Public infrastructure costs include drainage improvements and wastewater and water connections to the public utilities. Indirect public revenues will be generated by income taxes paid by construction workers. Increased property values will contribute increased taxes to the City and County of Honolulu.

4.2.8 Character of the Community

This project is located adjacent to the Papakōlea Residence Lots and will provide additional residential opportunities for other qualified DHHL applicants. The adjacent neighborhood is comprised of native Hawaiians and their families. As such, the character of the community reflects a unique island lifestyle.

Potential Impacts and Mitigative Measures

Dialog with the community through informational meetings has been and will continue to be an integral part of this project. KIC, the project developer for DHHL, have met with the Papakōlea Community Association, and County and State representatives to inform residents of the planning status of the project. KIC will continue to keep the Community Associations informed throughout the planning and development process.

Kalāwahine Streamside, as proposed by KIC, will provide residences which are designed for island living. As described in Section 2 of this report, the architecture will incorporate design elements such as pitched rooflines, railings and trim featuring Hawaiian tapa motifs. The new homes will enhance the overall community.

Although the proposed project will increase the population of the neighborhood, indirectly, the economic base of the region will be expanded, employment opportunities will be enhanced, and government revenues will be increased from income taxes paid by construction workers. It is anticipated that there will be only a slight increase on the demand for public services and infrastructure.

4.2.9 Infrastructure

Roads, water, sewer, drainage, electrical and communications improvements necessary for the project will be provided using existing connections. A Preliminary Drainage Report is included as Appendix A. No significant off–site infrastructure improvements will be required for the project.

4.2.9.1 Roadways

The DHHL site is vacant; there are no improved roadways on the subject property. An existing unimproved culvert crossing at Kanahā Stream at the end of 'Iaukea Street provides access to the project site. The project site is bordered by the following roadways:

- Tantalus Drive 60 feet right–of–way (City and County of Honolulu owned) to the north
- 'Iaukea Street 40 feet right–of–way (DHHL–owned / City maintained) to the west
- Anianikū Street 40 feet right–of–way (DHHL–owned / City maintained) to the west
- Kapahu Street 40 feet right–of–way (DHHL–owned / City maintained) to the west
- Na'ale Street 40 feet right–of–way (DHHL–owned / City maintained) to the west
- Kalāwahine Place 12 feet right–of–way (Privately–owned / City maintained) to the east

Potential Impacts and Mitigative Measures

The master plan proposes an access roadway to the Kalāwahine Streamside project from an extension of Kapahu Street where Kapahu presently Tees at Anianikū Street. An existing DHHL lessee directly across from Kapahu Street at TMK: 2–4–42:37 would require relocation to construct the extension.

The roadways will remain under DHHL ownership but will be maintained by the City and County of Honolulu pursuant to the Hawaiian Homes Commission Act. Roadways will be 28–feet wide (curb to curb) and will allow parking on both sides. Roadway design will accommodate refuse and fire vehicles and will be in accordance with the City's Subdivision Rules and Regulations. Roadways will be designed according to the ADA accessibility guidelines.

The proposed extension of Kapahu Street will be a two lane 28–feet wide (curb to curb) asphalt roadway. At Kanahā Stream, a 9–feet x 14–feet culvert will be installed. Each dwelling unit will be designed with a two–car garage; four parking stalls will be provided for park users.

Traffic impacts have been described in Section 4.2.2.

4.2.9.2 Water System

The Board of Water Supply owns and maintains two water systems in the surrounding DHHL Residence Lots area.

- The upper area above the elevation 305 feet are served off of the 705 feet elevation system. The 705 feet system has various size pipe lines in the area including an 8–inch line within Tantalus Drive, a 6–inch line within Mott–Smith Drive and an 8–inch line within Krauss Street.

- The areas below elevation 305 feet are served off of the 405 feet elevation system. This system includes an 8–inch line within 'Iaukea Street and Anianikū Street.

Potential Impacts and Mitigative Measures

The project site varies in elevation both below and above the 305 feet elevation. If allowed by the Board of Water Supply a connection to the high service 705 feet system from Tantalus Drive will be made. If not, then a parallel system from 'Iaukea Street will be constructed. This system would include an 8–inch extension of the 705 feet system from the end of the 8–inch main at Krauss Street. Those lots below 305 feet will be served by the 8–inch main within Anianikū Street.

The estimated average daily demand for water for the residential project is approximately 45,000 gallons per day (500 gallons per unit). The proposed water system will consist of an 8–inch water transmission lines, fire hydrants and water laterals. Once a firm layout is complete, a water system study will be prepared to show that the existing water system is adequate to support the project's water requirements. Water commitments for Kalāwahine Streamside have been secured by DHHL.

4.2.9.3 Sanitary Sewer System

There is an existing 8–inch sewer main within 'Iaukea Street as well as an existing 8–inch sewer main running within an easement within the lots adjacent to Anianikū Street. The existing sewer system is owned and maintained by the City and County of Honolulu.

An existing off–site sanitary sewer line/easement crosses the project site and the BWS parcel, crossing under Kanahā Stream and connecting to the existing sewer line running at the rear of the lots adjacent to Anianikū Street.

Potential Impacts and Mitigative Measures

The project proposes to extend the existing 8–inch sewer main from 'Iaukea Street and from the existing 8–inch main within the lots adjacent to Anianikū Street to serve the development. Studies indicate that the existing invert of the sewer lines are adequate to serve the development.

Depending on the final grades of the sewer line and the house elevations, units on the downhill side of the roadway may need individual sewer pumps and force main would be installed as part of the house construction at approximately $5,000 each.

The Department of Wasterwater Management has determined that the existing sanitary sewers are adequate to serve the proposed development and has issued a sewer connection permit.

4.2.9.4 Drainage Facilities

As described in Section 4.1.4, a Drainage Report (Sato & Associates 1998) has been prepared and is attached as Appendix A. The report includes a description of the existing drainage conditions and the proposed improvements. A detailed project development drainage report will be prepared during the roadway and utilities design phase.

Potential Impacts and Mitigative Measures

The proposed drainage system for the Kalāwahine Streamside development will include a box drain, catch basins, drain inlets, drain manholes, reinforced concrete pipes, diversion swales, and drain outlets. The 9 feet x 14 feet box drain will be used as a culvert over Kanahā Stream.

The proposed up–slope dwelling units will be protected by diversion swales, which will intercept storm water runoff and be tied to the overall drainage system. The proposed downslope dwelling units will be protected by the roadway with catch basins which will also connect to the overall system. The outlets along Kanahā Stream will have energy dissipators to reduce the velocity of the storm water from the outlet pipes.

DHHL and the developer have been informed of an erosion problem affecting existing off–site homes adjacent to Kanaha Stream. Although these homes are not a part of the proposed development, the developer's Project Engineer will, as an accommodation to the affected lessees, review this problem.

4.2.9.5 Utilities

Electrical, telephone and cable television services for the project are available from the overhead utility lines on 'Iaukea Street and Anianikū Street. Papakōlea is served by the Hawaiian Electric Light Company (HECO). Telecommunications service on Hawaiian Home Lands is provided by Sandwich Isle Telecommunications, Inc.

Potential Impacts and Mitigative Measures

The Kalāwahine Streamside project will utilize an underground system within the roadway easement for the transmission of utility lines. These will include electrical, telephone and cable television lines.

4.2.10 Public Facilities

4.2.10.1 Hazardous Waste

A Phase 1 investigation for hazardous materials was conducted; nothing was found on the project site. A concrete pipe segment was located on the Board of Water Supply site; testing would determine if it contains asbestos. Removal of the pipe will be coordinated prior to any construction that may affect it. There is no record of hazardous waste activity on the proposal site, nor is it on the Federal CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) list.

4.2.10.2 Solid Waste Disposal

Vegetation removed from the property during the construction of the project will be chipped and disposed at a City and County approved landfill. Other construction material debris will be recycled or disposed in a similar manner. Solid waste generated from residences of the project will be collected and disposed of by the City and County, Department of Public Works, Refuse Division.

4.2.11 Public Services

4.2.11.1 Fire Protection

The Makiki Fire Station is the primary fire station to serve the Papakōlea area. Response time to the project is three to five minutes. Back–up, or secondary support, will come from Kuakini and/or Central Fire Stations.

The project will be served by existing water mains in 'Iaukea Street and Anianikū Street.

Potential Impacts and Mitigative Measures

There will be an occasional and unavoidable demand for fire protection services associated with the project. The applicant will advise the fire department of project implementation and phasing to permit adequate planning and advance notice of project completion.

As part of the proposed project, the water transmission system and lines with adequate fire flow capacity and fire hydrants will be installed within the property. The water system within the project are anticipated to fall within the Board of Water Supply jurisdiction and all related fire infrastructure will be designed to meet City standards. The design standards shall include the location of fire hydrants and minimum fire flow standards.

Access for emergency vehicles into the project site will be from the Kapahu Street extension and will be established in the circulation plan for the overall project. Roadways will be all–weather surfaces and will be designed to meet Department of Transportation Services standards.

4.2.11.2 Police Protection

The Downtown Police Substation located on Hotel Street and the Main Police Station located on South Beretania Street currently serve the Papakōlea area.

Potential Impacts and Mitigative Measures

Any population increase or new development has impacts on Police services, however, it is anticipated that the existing available Police services will not be adversely affected by the proposed development.

4.2.11.3 Health Care Services

Honolulu–based clinics and hospitals provide primary patient care to adults, women, and children. The nearest hospitals to the Papakōlea area are Queen's Medical Center, Kuakini Hospital, St. Francis Hospital, Kaiser Hospital, and Straub Clinic and Hospital, Inc.

Emergency ambulance service to serve the area is available from several locations in the primary urban center. The closest available service would respond from St. Francis, Punchbowl Street, Young Street and Liliha Street which all serve the Papakōlea area.

Potential Impacts and Mitigative Measures

The project will not have a significant impact on health care and medical facilities because of the slight increase in population in the area since the operations of the various facilities are not at capacity.

4.2.11.4 Schools

Public schools which serve the project area include Lincoln Elementary, Stevenson Intermediate, and Roosevelt High School. As shown in Table 8, the current enrollments at all three schools are below capacity.

TABLE 8
ENROLLMENT AT PUBLIC SCHOOLS IN THE AREA OF THE PROJECT

Grade Level	Enrollment		Capacity (1997)
	1997	1998*	
Elementary (Lincoln)	588	635	721
Intermediate (Stevenson)	538	543	1,059
High (Roosevelt)	1,533	1,466	1,633

*Projected enrollment
Source: Department of Education, Facilities Branch, April 1998.

In addition to Lincoln, other elementary schools which feed to Stevenson Intermediate are Pauoa, Royal, Nu'uanu, Ka'ahumanu, Noelani, and Mānoa Elementary Schools. In addition to Stevenson, other intermediate school choices are Washington and Central Intermediate Schools and private schools.

Potential Impacts and Mitigative Measures

The project will increase the residential population of the area, thereby adding to the student population. A total of approximately 72 students are expected to be generated by the project: 38 elementary school students in grades kindergarten to grade five; 16 intermediate students in grades six through eight; and 18 high school students in grades nine through twelve. This projection is based on the higher average family size of 5.5 persons per household for Hawaiian Home Lands, which is 61.6 percent higher than the DOE's standard multiplier. At all three schools, Lincoln

Elementary, Stevenson Intermediate and Roosevelt High Schools, the additional students from the Kalāwahine project will not have a negative effect on the enrollments of the schools.

TABLE 9
PROJECT IMPACT ON AREA SCHOOLS

Grade Level	Kalāwahine Project Students	Student Enrollment (1998)	Projected Enrollment with Project	Capacity
Elementary (Lincoln)	38	635	673	721
Intermediate (Stevenson)	16	543	559	1,059
High (Roosevelt)	18	1,466	1,484	1,633

Source: Department of Education, Facilities Branch, April 1998.

4.2.11.5 Recreational Facilities

The project site is within walking distance to the Papakōlea Recreation Center and the three public schools in the area.

Potential Impacts and Mitigative Measures

The proposed project provides new recreational opportunities for Kalāwahine Streamside residents and the adjacent Papakōlea and Kewalo neighborhoods which would include a park and streamside walking trail, imu pit, and an open air pavilion.

4.2.11.6 Public Transit

The nearest two accommodations to the City and County Bus System are at ʻAuwaiolimu Street near the intersections of Anianikū and Kapahu Streets, within a reasonable walking distance from the project. An additional bus stop is located on Tantalus Drive near Krauss Street.

4.2.11.7 Proximity of Commercial and Other Services

The project is within the primary urban center, and therefore within minutes to major commercial, medical, and other business and service sector areas including downtown Honolulu, Makiki, Ala Moana and Kalihi.

5.0 Alternatives to the Proposed Action

5.0 ALTERNATIVES TO THE PROPOSED ACTION

In compliance with the provisions of Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, Section 11–200–17(f), the "known feasible" alternatives to the proposed project are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts. As such, several alternatives have been evaluated.

5.1 NO ACTION ALTERNATIVE

The No Action alternative will not accomplish the desired goal of providing housing for qualified Hawaiians on the DHHL list for homesteads. Without the project, 6,014 native Hawaiians who are currently on the DHHL residential waiting list will continue to wait for available homesteads and homesites. Although DHHL's Princess Kahanu project in Wai'anae eventually sold out, a common reason for applicants' declining a home in that project was the great distance from downtown Honolulu where many are employed. DHHL's inventory of land in Honolulu is small. Without the Kalāwahine Streamside project, fewer qualifying Hawaiian would be recipient of homestead awards.

5.2 ALTERNATIVE SITES

In 1993, DHHL performed site assessment and feasibility studies (Group 70 1993) for the development of housing at three locations on O'ahu. The studies included the subject site at Kalāwahine, the 33–acre site known as the Moreira Dairy site in Papakōlea, and a 7.29 acre site at Waimānalo. Each site was evaluated for its potential to build appropriate uses including housing for elderly Hawaiians and native Hawaiians. The conclusions of the study to select the Kalāwahine site for duplex and single family homes were supported by the criteria required for an optimal housing project.

Kalāwahine was determined to be suitable for hillside homes. The topographical constraints of the subject site were determined to be too steep for elderly housing and too costly for self–help home construction. Concurrent with the planning of the subject Kalāwahine project, the flat Waimānalo site is being planned as the Waimānalo Kūpuna Housing Project.

5.3 ALTERNATIVE ACCESS CONSIDERATIONS

Dual access to the proposed Kalāwahine Streamside from 'Iaukea Street in upper Papakōlea and from an extension of Kapahu Street in Kewalo were first considered in a conceptual plan. Kewalo could accommodate the additional traffic adequately, whereas, access from 'Iaukea may have required restricted parking to only one side of the street and/or construction of additional parking pads and garages. Such construction would be more costly due to the need to excavate into the rock slope for uphill lots *or* to elevate garages on the downhill sloped lots. Access from Tantalus Drive, Kalāwahine Place or 'Auwaiolimu Street would make the project economically unfeasible due to the cost of bridges, additional road costs and steep grades which would require massive retaining walls.

6.0 Determination, Findings, and Reasons for Supporting Determination

6.0 DETERMINATION, FINDINGS AND REASONS FOR SUPPORTING DETERMINATION

To determine whether the proposed action may have a significant impact on the environment, every phase and expected consequences, both primary and secondary, and the cumulative as well as short–and long–term effects have been evaluated. Based on the studies performed and research evaluated, a finding of no significant impact is anticipated and is summarized in this section.

6.1 SIGNIFICANCE CRITERIA

According to the Department of Health Rules (11–200–12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects and its short and long–term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

- **Involves an irrevocable commitment to loss or destruction of any natural or cultural resources.**

  The proposed Kalāwahine Streamside project is designed as two– and three–story buildings and will not impact scenic views of the ocean or any ridge lines in the area. The visual character of the area will change from the current vacant land to a developed residential development of single family and duplex units. The design will be compatible with the surrounding DHHL homes adjacent to the proposed project. The plant and wildlife which occur on the property are comprised entirely of exotic species; no natural resources requiring protection occur on the site. In addition, the subject property is located outside of the City and County's Special Management Area (SMA).

  The property has been altered by past historic uses in the past. An archaeological inventory by the State Historic Preservation Division identified five historic period sites but no pre–contact sites. As such, it has been determined by the SHPD that the project should have "no effect" on historic resources. Should any archaeologically significant artifacts, bones, or other indicators of previous on–site activity be uncovered during the construction phases of development, their treatment will be conducted in strict compliance with the requirements of the Department of Land and Natural Resources.

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

  The project site is a 26.5–acre steeply sloped property. Consequently, the project is planned to be construction on 15 acres of the site which would be suitable for home construction. The construction of this permanent subdivision will foreclose other uses, however, the proposed use of the project outweighs other uses. The provision of residential housing at this location could be determined to be the highest and best use of the property since 95 native Hawaiian households would benefit from the new homes.

- **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 development is consistent with the Environmental Policies established in Chapter 344, HRS.

- **Substantially affects the economic or social welfare of the community or state.**

  The new housing opportunities will positively affect the social welfare of native Hawaiians on the DHHL list who are waiting for residential homesteads, specifically Hawaiians who desire living in close proximity to the downtown workplace. The projected prices (ranging from $180,000 to $235,000) of the single family and duplex units (without the high land cost of primary urban center residential lots), makes it possible for families to economically afford to live in a planned community consisting of well designed and skillfully constructed homes. Home ownership is possibly the greatest investment Hawai'i residents will make in their lifetime. Kalāwahine Streamside will provide that opportunity for Hawaiians employed in urban Honolulu without compromising their lifestyle through long daily commutes from rural areas where residential homesteads are more readily available.

- **Substantially affects public health.**

  Impacts to public health may be affected by air, noise, and water quality impacts during the construction phase of the project, however, these will be short–term and insignificant or not detectable, especially when weighed against the positive economic, social, and quality of life implications associated with the project.

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

  The project will have a small impact on the local population; however, it is anticipated that some of the new families to reside at Kalāwahine are already in Papakōlea and may be living in extended family situations. The project will provide opportunities to many in this type of situation while allowing them to remain in the same area as their extended families.

  The population is expected to increase by 455 to 523 people. The demand on schools and infrastructure will be limited. The infrastructure demands (roads, water, sewer) are minimal and can be accommodated by the existing systems.

  In addition, construction employment opportunities will generate direct and indirect revenue for individuals, and the State of Hawai'i by providing short–term employment opportunities during the construction period. Indirect employment in a wide range of service related industries will also be created from construction during project development. Increased property values from the current vacant land status to improved residential properties will result in increased revenue to the City.

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

  The proposed development will utilize existing vacant land and is not expected to degrade environmental quality on–site or in the surrounding neighborhood. The property was previously modified and today lacks any significant natural resources. With development of the proposed project, diversity in plant communities is expected to improve through a program of landscaping which will utilize native trees and shrubs in greater abundance than what presently exists on the site. Appropriate best management practices (BMPs) will provide safeguards for protection of water quality during the short–term construction period.

  The visual impact will be similar to other existing residential homes in the area and overall design will complement background vistas. Makai views from the subject property are available, however, they are not significant nor generally available to the public in the property's present restricted condition.

- **Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions.**

  The environmental resources on the project site are limited to introduced plant and animal species. Once completed, the landscape plantings will bring to the site native species of plants which may possibly attract native birds to the property. While the development of the project can be seen as a more intense use of the land in recent times, the overall project will bring a new balance and introduce cultural and natural resources to the site.

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

  Biological surveys undertaken at the property indicate that no rare, threatened or endangered species occur on the property.

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

  Any possible impact to Kanahā Stream resulting from surface runoff, will be mitigated by the establishment of on–site detention during the construction phases of development and in the long–term operation of the project. After development, runoff would be directed to landscaped areas to encourage recharge of the groundwater. Minimal impacts on air quality and noise are anticipated during construction, but will be limited by normal construction practices (i.e., mufflers, water wagons, construction during daylight hours only, etc.). Over the long–term, traffic noise during peak periods (due to the overall increase in area traffic) may increase, however, landscape plantings and building design will mitigate any increase in noise levels. BMPs will be implemented for water quality protection to the extent practicable.

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

  Development of the property is compatible with the above criteria since there are not environmentally sensitive areas associated with the project and the physical character of the site has been previously disturbed by past activities. Shoreline, valleys, or ridges will not be

impacted by the development. Although some homeowners off–site of the project have reported erosion problems during high rainfall periods, any additional runoff which would result from the development of the project will be not be significant according to a drainage study prepared for the project. Based on a 50 year recurrence interval storm, the calculations indicate an estimated flow increase of 20.7 cfs. The increase in flow is about 1.53 percent during peak flow conditions. Therefore, the effects of the project on the existing downstream improvements appear negligible.

A soils study for the project is currently being prepared by the soils engineer. Preliminary findings indicate that from a geotechnical viewpoint, the site is generally suitable for development. Slide potential throughout most of the site is low as the area is covered by only a thin layer of silty clay overlying weathered rock and weathered volcanic cinder strata. In the lower sections of the site, the surface layer of silty clay is thicker and mixed with numerous cobbles and boulders. The stability of slopes planned in the lower section of the site is being evaluated as part of the soils study, and if necessary, mitigative measures to reduce the potential for sliding will be included in the construction plans. The final report will contain the boring logs showing the results of the soil borings and the engineering requirements for the project. The soils study will be submitted to the Department of Public Works and all grading activities will be approved by the City prior to construction.

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

  Public views of Punchbowl and Tantalus are available from different streets in the Primary Urban area of Honolulu. The subject property is designated within the Punchbowl Special District by the City and County of Honolulu, however, the property is not located in the "core area". The low–rise two– and three–story design of the residential homes are not expected to impede these views and will be similar to other hillside homes in the adjacent areas. In addition, the Land Use Ordinance Section 7.50–5 specifically exempts duplexes and one–family and two–family detached dwellings from the requirements of the Punchbowl Special District if they are outside of the core area (see Figure 8).

- **Requires substantial energy consumption.**

  Construction of the proposed project will not require substantial energy consumption relative to other similar projects. Once completed the residential homes are expected to consume energy (i.e., electricity and gas) similar to other developments.

6.2 DETERMINATION

On the basis of the above criteria, and the discussion of impacts and mitigative measures contained in this document, it is anticipated that the proposed project will not have a significant effect on the environment.

7.0 Comments and Responses

7.0 COMMENTS AND RESPONSES

The public comment period as required by Chapter 343, Hawai'i Revised Statutes, on the Draft EA resulted in the following responses from governmental agencies, community organizations and individuals. The comments and our responses are included in this section.

7.1 COMMENTS RECEIVED ON THE DRAFT EA

State of Hawai'i

Department of Education
Department of Land and Natural Resources – Historic Preservation Division
Office of Environmental Quality Control
Office of Hawaiian Affairs

City and County of Honolulu

Board of Water Supply
Building Department
Department of Parks and Recreation
Department of Public Works
Department of Wastewater Management
Planning Department

Federal Government

US Army Corps of Engineers

Community

Senator Carol Fukunaga
Arlene G. Woo
University of Hawai'i Environmental Center

7.2 DRAFT EA COMMENT LETTERS AND THE APPLICANT'S RESPONSES

The following section includes letters responding to the Draft EA and the Applicant's responses.

0000 0026 2792

BENJAMIN J. CAYETANO
GOVERNOR

ROY S. OSHIRO
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO:

98:PPE/1696

May 7, 1998

TO: The Honorable Kali Watson, Director
Department of Hawaiian Home Lands

FROM: Roy S. Oshiro
Executive Director

SUBJECT: Draft Environmental Assessment for the Kalawahine Streamside

Thank you for the opportunity to review the subject draft assessment.

HFDC is responsible for monitoring the relocation assistance programs of state and county agencies pursuant to Chapter 111, Hawaii Revised Statutes. We note that one existing household will be relocated as a result of the proposed project. Please provide us with a copy of your relocation assistance plan for review and comment.

c: Office of Environmental Quality Control

HFDC

0000 0026 2793

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 14, 1998

To: Roy S. Oshiro, Executive Director
Housing Finance and Development Corporation

From: Kali Watson, Chairman
Hawaiian Homes Commission

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your memorandum dated May 1, 998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

A relocation assistance plan to aid the Hawaiian Home Lands lessee at TMK 2-4-42: 37 will be prepared and submitted to HFDC pursuant to Chapter 111, Hawaii Revised Statutes.

Thank you for participating in the environmental review process.

0000 0026 2794

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
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Ref. No. P-7418

May 1, 1998

DEPT. OF HAWAIIAN HOME LANDS
May 13 3 24 PM '98

MEMORANDUM

TO: Kali Watson, Director
Department of Hawaiian Home Lands

FROM: Rick Egged
Director, Office of Planning

SUBJECT: Draft Environmental Assessment for Kalawahine Streamside Residential Subdivision

The project will develop a 98-unit residential subdivision for native Hawaiians near Papakolea, Honolulu. Because there will be ground and drainage alteration activities associated with this project, the potential for soil erosion and polluted runoff exists. We suggest that the draft environmental assessment be revised to include measures for controlling soil erosion and polluted runoff during the construction phase of the project. We recommend that you consult our *Coastal Nonpoint Pollution Control Program Management Plan* which contains management measures for site development and construction activities. These measures can be found in the "Management Measures for Urban Areas" section of this document.

If there are any questions, please contact Steve Olive of our CZM Program at 587-2877.

cc: OEQC

0000 0026 2795

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 14, 1998

To: Rick Egged, Director
Office of Planning
Department of Business, Economic Development & Tourism

From: Kali Watson, Chairman
Hawaiian Homes Commission

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your memorandum dated May 1, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following response to your comments.

The project master plan will provide 95 new single-family and duplex homes on approximately 15 acres of the 26.5-acre site. The master plan is designed to maintain the large canopy trees and existing vegetation along the back pali slopes, as practicable, to minimize earthwork during construction.

To protect water quality in downstream areas during construction, erosion control measures to address run-off will include detention basins and swales, silt curtains, minimizing the amount of graded open areas, and grassing soon after grading.

We will consult your *Coastal and Nonpoint Pollution Control Program Management Plan* for additional management measures for site development and construction activities.

Thank you for participating in the environmental review process.

0000 0026 2796

BENJAMIN J. CAYETANO
GOVERNOR

DEPT. OF HAWAIIAN HOME LANDS
APR 23 10 45 AM '98

HERMAN M. AIZAWA, Ph.D.
SUPERINTENDENT

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

OFFICE OF THE SUPERINTENDENT

April 14, 1998

MEMO TO: The Honorable Kali Watson, Chairperson
Hawaiian Homes Commission, DHHL

F R O M: Herman M. Aizawa, Ph.D., Superintendent
Department of Education

SUBJECT: Kalawahine Streamside Draft EA

The Department of Education (DOE) has the following comments on the subject Draft Environmental Assessment:

1. Table 7 on page 54 should indicate that the 1998 enrollments are projected, not actual. Revise the 1998 projected enrollments as follows: Lincoln (635); Stevenson (543); and Roosevelt (1,466).

2. Table 7 should indicate that the capacities listed are 1997 capacities. Revise capacities as follows: Lincoln (721); Stevenson (1,059); and Roosevelt (1,633).

3. The projected enrollment impacts listed in Table 8 are based on the DOE's standard enrollment multipliers. However, since the average household size of Department of Hawaiian Home Lands projects is estimated to be 5.5 (per PBR Hawaii), the enrollment impacts from Kalawahine Streamside should be increased proportionately.

   The revised enrollment impacts based on 98 units are as follows: Lincoln (38 students); Stevenson (16 students); and Roosevelt (18 students).

4. The DOE typically requests from housing developers fair-share contributions to be used for capital improvements at area schools. Given DHHL's unique status, we request the opportunity to discuss alternative means by which the enrollment impacts from Kalawahine Streamside, and in fact DHHL projects statewide, can be mitigated.

Thank you for the opportunity to comment.

HMA:SB:hy

cc: A. Suga, OBS
M. Shishido, HDO
OEQC
M. Otake, DHHL
Y. Ohashi, PBR Hawaii

0000 0026 2798

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 8, 1998

To: Herman M. Aizawa, Ph.D., Superintendent
Department of Education

From: Kali Watson, Chairman KW
Hawaiian Homes Commission

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your memorandum dated April 14, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

1. We have revised the 1998 projected enrollments in Table 7 as follows: Lincoln (635); Stevenson (543); and Roosevelt (1,466). We have also indicated that the 1998 enrollments are projected and not actual.

2. We have also revised Table 7 to list the following 1997 capacities: Lincoln (721); Stevenson (1,059); and Roosevelt (1,633).

3. We note that the number of projected new homes at Kalawahine Streamside has been revised from 98 to 95. The reduction is based on a detailed topographic survey which was recently completed. In discussions with the community and also examining the higher average household size of DHHL homes we have revised the project's projected impact on the area schools. The revised enrollment impacts as shown on Table 8 based on the 98 units are expected to be as follows: Lincoln (38 students); Stevenson (16 students); and Roosevelt (18 students).

4. DHHL is willing to meet with the Department of Education to discuss alternative means by which the enrollment impacts of this (and other DHHL projects) can be mitigated.

We hope this adequately responds to your comments. Thank you for participating in the environmental review process.

0000 0026 2799

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

April 20, 1998

Kali Watson, Director
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawaii 96805

LOG NO: 21317
DOC NO: 9804EJ08

Dear Mr. Watson:

SUBJECT: **Chapter 6E-8 Historic Preservation Review -- Draft Environmental Assessment (DEA): Kalawahine Streamside**
Kalawahine 'Ili
Honolulu, Kona, O'ahu
TMK: 2-4-34: por. 8;, por. 9, 11 & 22; 2-4-39: 1, 2; 2-4-40:1; 2-4-42: por. 1 & 37

Thank you for the opportunity to review the DEA for this project. The DEA correctly incorporates our earlier comments that based on archaeological survey conducted on these parcels for the DHHL, we believe that it is highly unlikely that significant historic sites are present and that development actions would have "no effect" on historic sites.

Should you have any questions, please feel free to call Elaine Jourdane at 587-0014.

Aloha,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

0000 0026 2800

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 11, 1998

To: Don Hibbard, Administrator
Historic Preservation Division
Department of Land and Natural Resources

From: Kali Watson, Chairman
Hawaiian Homes Commission

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your memorandum dated April 20, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project.

We acknowledge the Historic Preservation Division's extensive work performed in the early 1990's to survey the subject property. We also acknowledge your assessment that it is highly unlikely that significant historic sites are present and that development actions would have "no effect" on historic sites.

Thank you for your participation in the environmental review process.

0000 0026 2801

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
236 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

May 8, 1998

Honorable Kali Watson, Chairperson
State of Hawai'i Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawai'i 96805

Dear Mr. Watson:

We submit for your response the following comments on a draft environmental assessment (DEA) for Kalāwahine Streamside, Papakōlea, Honolulu Judicial District, O'ahu.

1. **SOILS, DRAINAGE AND STRUCTURAL STABILITY.** Section 4.1.3 describes the various U.S. Department of Agriculture soil types in the project area. Using plain language, and in light of drainage considerations discussed in section on 4.1.4. please draw inferences on the structural stability of the proposed units.

2. **WATER QUALITY IMPACTS.** Page 27 of the DEA notes that Kanahā intermittent stream runoff would be increased due to increased impermeable surface area from the project. Please discuss the cumulative impact of downstream siltation and nonpoint source pollution on the Ala Wai Canal.

3. **STREAM RESOURCES.** Page 35 of the DEA notes that the Division of Aquatic Resources, Department of Land and Natural Resources, has determined that the stream area above 'Auwaiolimu Street has no biological resources. Pages 15 and 16 of the DEA also note that the stream will be preserved by the project master plan. We surmise from this that the stream will never be altered or channelized. Please provide details to confirm or correct this assumption in the final environmental assessment.

4. **STREAM MAINTENANCE.** Please discuss if the Department of Hawaiian Home Lands will be responsible for periodic cleaning and vegetation cutbacks in the Kanahā Stream. If not, please discuss who will be responsible.

5. **ENERGY EFFICIENT BUILDING DESIGN.** Please discuss design elements being undertaken to ensure that the units will be energy efficient through solar energy panels, architecture that maximizes prevailing trade wind flows, low flush toilets, etc.

Please include a copy of this letter, all timely-received comment letters and your responses in the final environmental assessment for this project. If there are any questions, please call Mr. Leslie Segundo, Environmental Health Specialist at 586-4185. Thank you.

Sincerely,

GARY GILL
Director of Environmental Quality Control

c: Mr. Elton Wong, Kamehameha Investment Corporation
Ms. Yukie Ohashi, PBR Hawai'i

0000 0026 2802

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 11, 1998

To: Gary Gill, Director
Office of Environmental Quality Control

From: Kali Watson, Chairman
Hawaiian Homes Commission

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated May 8,1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

1. **Soils, Drainage and Structural Stability.** The preliminary findings of the soils engineer indicate that from a geotechnical viewpoint, the site is generally suitable for development. Slide potential throughout most of the site is low as the area is covered by only a thin layer of silty clay overlying weathered rock and weathered volcanic cinder strata. In the lower sections of the site, the surface layer of silty clay is thicker and mixed with numerous cobbles and boulders. The stability of slopes planned in the lower section of the site is being evaluated as part of the soils study, and if necessary, mitigative measures to reduce the potential for sliding will be included in the construction plans.

2. **Water Quality Impacts.** The project development is planned on approximately 15 acres of the 26.5-acre site. The master plan is designed to maintain the existing vegetation along the back pali slopes and many of the large canopy trees, as practicable, to minimize earthwork and maintain the natural topographic features of the site.

   To protect water quality in downstream areas during construction, erosion control measures to address run-off will include detention basins and swales, silt curtains,

minimizing the amount of graded open areas, and grassing soon after grading.

In compliance with the Department of Public Works requirements, detention basins and other means of retaining run-off will be considered in the final design of the project. The project's civil engineer will coordinate the engineering plans with the Department of Public Works to achieve no net increase in run-off. Landscaping by the developer and homeowners will establish permanent ground cover to hold soils in place and will include grassed lawns and native and ornamental shrubs and trees. These measures will prevent soil erosion over the long-term and will maintain the existing water quality. Implementation of these measures will minimize downstream siltation and nonpoint source pollution on the Ala Wai Canal.

3. **Stream Resources.** The project will require alteration to Kanaha Stream to construct an access road over a box culvert across the stream. This is described in Sections 2.3.1 and 4.1.4 of the Draft EA. Our consultation with the Department of Land and Natural Resources Commission on Water Resources Management confirmed that this crossing would not require a Stream Channel Alteration Permit since Kanaha Stream does not support instream uses and is therefore, not considered to be a stream as defined in Hawaii Revised Statutes, Section 174C-3. The absence of biological resources was verified with the Division of Aquatic Resources. The alteration will require a Corps of Engineers permit as noted in Section 3.3 of the Draft EA.

4. **Stream Maintenance.** The DHHL will maintain ownership of the proposed Kalawahine Streamside parkway and Kanaha Stream, and, with the community, will be proactive in taking steps to clean any existing debris and clear vegetation overgrowth.

5. **Energy Efficient Building Design.** Architectural design elements not only include aesthetic Hawaiian tapa motifs but also include elements that will maximize prevailing trade winds through large windows and lanais. Fixtures, including toilets, showers, and sinks will be the energy saver type for water conservation. Conventional electrical hook-ups will service all homes. Solar energy panels will be installed at the discretion of individual homeowners. Energy

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STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813-5249
PHONE (808) 594-1888
FAX (808) 594-1865

April 30, 1998

Mr. Kali Watson
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805

Doc. EIS No. 168

Subject: Draft Environmental Assessment (DEA) for Kalawahine Streamside, Papakolea, Island of Oahu

Dear Mr. Watson:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for Kalawahine Streamside, Papakolea, Island of Oahu. The Department of Hawaiian Home Lands (DHHL) is proposing to develop a residential subdivision which is intended to provide housing opportunities for Native Hawaiians. The project consists of about 27 acres of land adjacent to Tantalus Drive and bounded by residential properties in the DHHL Papakolea Residence Lots. The blueprint for the project depicts a development of 98 dwelling units which include 22 single-family and 76 duplex-family homes.

The Office of Hawaiian Affairs (OHA) has reviewed the DEA. Based on information contained in it, OHA concludes that the project apparently bears some potential adverse impacts.

First, the project is located on a moderate to steep slope terrain and contains highly erodible soils. Hence, if improperly designed and implemented, there is a high likelihood that the development will increase runoff and soil erosion. OHA urges the applicant to include in the DEA specific measures addressing runoff and erosion during and after the development is completed..

Second, the project is located adjacent to Kanaha stream. Although the DEA states that the stream is intermittent and has no biological resources, no field data has been collected to substantiate otherwise. If the development takes place, OHA views the Kanaha stream as a potential outlet for disposal of substances and materials. Hence, OHA urges the applicant to develop mitigation measures for stream preservation.

Please contact Colin Kippen (594-1938), LNR Officer, or Luis Manrique (594-1758), should you have any questions on this matter.

Sincerely yours,

Randall Ogata
Administrator

for Colin Kippen
Officer,
Land and Natural
Resources Division

cc: Board of Trustees

0000 0026 2806

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 8, 1998

To: Randall Ogata, Administrator
Colin Kippen, Officer
Office of Hawaiian Affairs

From: Kali Watson, Chairman KW
Hawaiian Homes Commission

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated April 30, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

1. The project master plan will provide 95 new single-family and duplex homes on approximately 15 acres of the 26.5-acre site. The master plan is designed to maintain the existing vegetation along the back pali slopes and large canopy trees, as practicable, to minimize earthwork during construction. Landscaping by the developer and homeowners will establish permanent ground cover to hold soils in place and will include grassed lawns and native and ornamental shrubs and trees. These measures will prevent soil erosion over the long-term.

   To protect water quality in downstream areas during construction, erosion control measures to address run-off will include detention basins and swales, silt curtains, minimizing the amount of graded open areas, and grassing soon after grading.

2. A soils study for the project is currently being prepared by the soils engineer. Preliminary findings indicate that from a geotechnical viewpoint, the site is generally suitable for development. Slide potential throughout most of the site is low as the area is covered by only a thin layer of silty

clay overlying weathered rock and weathered volcanic cinder strata. In the lower sections of the site, the surface layer of silty clay is thicker and mixed with numerous cobbles and boulders. The stability of slopes planned in the lower section of the site is being evaluated as part of the soils study, and if necessary, mitigative measures to reduce the potential for sliding will be included in the construction plans. The soils report will be submitted to the Department of Public Works upon its completion.

3. We have consulted with the Department of Land and Natural Resources Division of Aquatic Resources and received their determination that this portion of Kanaha Stream is not considered to be a stream because it does not support instream uses, as defined in Hawaii Revised Statutes Section 174C-3.

4. We are aware that portions of Kanaha Stream are littered with debris. The Department will maintain ownership of the proposed Kalawahine Streamside parkway and Kanaha Stream, and, with the community, will be proactive in taking steps to clear any existing debris. Further, the formation of a new community association for the Kalawahine Streamside homes will result in the establishment of rules which will address littering and dumping in Kanaha Stream. These rules will be enforced by the community association and/or DHHL.

We have addressed your concerns in the Final EA. Thank you for participating in the environmental review process.

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BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714

May 8, 1998

Mr. Kali Watson, Director
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Watson:

Subject: Draft Environmental Assessment for the Kalawahine Streamside Project, Papakolea, Oahu; TMK: 2-4-34: Por. 08, Por. 09, 11, 22; 2-4-39: 01, 02; 2-4-40: 01; 2-4-42: Por. 01, 37

Thank you for the opportunity to review the Draft Environmental Assessment (EA) for the proposed housing development.

We have the following comments to offer:

1. The Board of Water Supply (BWS) is currently working with Department of Hawaiian Home Lands (DHHL) to utilize 4.5 acres of the 6.0 acre parcel for this project. The remaining 1.5 acres will be utilized for a reservoir project which is needed for the Honolulu low service system. However, the configuration of the 6.0 acre parcel, as proposed in the EA, will not allow enough usable area to site our reservoir. In addition, the BWS site is within the Kanaha Stream floodway, further reducing the usable area. Roads B and C should be shortened to allow the reservoir to be sited along the southern boundary, adjacent to Roosevelt High School. We would also need access to this portion of the parcel. At your convenience, we would like to discuss the parcel configuration with you and your staff. We are planning to fund a feasibility study in fiscal year 1998-1999 for the reservoir site.

2. The developer should submit a water master plan for the proposed development due to the topography and various connection proposals. The parcel extends between two water service zones; the 405' and the 705' service areas. The master plan should include hydraulic calculations showing that the proposed mains can provide adequate fire protection and peak hour pressures. It should also take into consideration our water system standards for maximum allowable static pressure, water service limit, and any master metering requirements.

3. The development has a water allocation from the DHHL.

4. The availability of water will be determined when the construction drawings are submitted for our review and approval. If water is made available, the applicant will be required to pay the applicable Water System Facilities Charges for transmission and daily storage.

5. There are five active and one inactive water services currently serving the project site.

6. Our cross-connection control requirements will be determined when the construction plans and building permit applications are submitted for our review and approval.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

BROOKS H. ~~M.~~ YUEN
Acting Manager and Chief Engineer

cc: Office of Environmental Quality Control
PBR Hawaii

0000 0026 2810

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 11, 1998

Mr. Brooks H.M. Yuen
Acting Manager and Chief Engineer
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Yuen:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated May 8, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

1. We are evaluating the master plan to address your concern about the configuration of the proposed Board of Water Supply site. Our developer, Kamehameha Investment Corporation will be calling you shortly to schedule a meeting with your staff to discuss the possible alternatives.

2. A Water Master Plan will be submitted to the Board for your review and approval. The project's water system will be designed according to the Board of Water Supply's water system standards.

3. We acknowledge that the Department has allocated water to this development.

4. The project construction drawings will be submitted to you for your review and approval. The developer will comply with the applicable Water System Facilities Charges for transmission and daily storage.

5. We acknowledge that there are five active and one inactive water services currently serving the project site.

6. In addition, we recognize that cross-connection requirements will be determined when the construction plans and building permit applications are submitted to you for review and approval.

We will be calling your staff to review the Board's requirements. Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

0000 0026 2812

BUILDING DEPARTMENT

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI
DIRECTOR AND BUILDING SUPERINTENDENT

ISIDRO M. BAQUILAR
DEPUTY DIRECTOR AND BUILDING SUPERINTENDENT

PB 98-239

April 16, 1998

Mr. Kali Watson, Director
Department of Hawaiian Home Lands
State of Hawaii
P. O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Watson:

Subject: Kalawahine Streamside Draft Environmental Assessment

This is in response to your request of April 3, 1998 to review and comment on the subject material.

We have no comments to offer but appreciate the opportunity to review the document.

Should there be any questions, please contact Douglas Collinson at 527-6375.

Very truly yours,

RANDALL K. FUJIKI
Director and Building Superintendent

cc: Office of Env. and Quality Control

0000 0026 2813

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 8, 1998

Mr. Randall K. Fujiki, Director and Building Superintendent
Building Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Fujiki:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated April 16,1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project. We note that your agency has no comments on the Draft EA.

Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

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DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 10TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4182 • FAX: (808) 523-4054

DEPT. OF HAWAIIAN
HOME LANDS

MAY 7 9 10 AM '98

JEREMY HARRIS
MAYOR

WILLIAM D BALFOUR, JR.
DIRECTOR

MICHAEL T. AMII
DEPUTY DIRECTOR

May 5, 1998

Mr. Kali Watson, Director
Department of Hawaiian Home Lands
State of Hawaii
P. O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Watson:

Subject: Draft Environmental Assessment (DEA) for the Kalawahine Streamside Project, Honolulu, O'ahu, Hawaii
Tax Map Key No: 2-4-034:008(por.), 009(por.), 011 & 022; 2-4-039:001 & 002; 2-4-040:001; 2-4-042:001(por.) & 037

We have reviewed the DEA for the above-described project and offer the following comments and recommendation.

1. Landscape plantings shown in the Conceptual Master Plan, Figure 3, Page 11, and described in Section 2.3.5, Page 12 of the DEA are acceptable.

2. The proposed 98-unit residential development project consisting of 22 single-family and 76 duplex units will need to comply with Park Dedication Ordinance No. 4621.

We recommend that you contact Mr. Lester Lai of our Advance Planning Branch at 523-4696 if you have any questions and to discuss park dedication requirements for your proposed private park.

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

Sincerely,

W. D. Balfour, Jr.

WILLIAM D. BALFOUR, JR.
Director

WDB:js

cc: OEQC

0000 0026 2815

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 8, 1998

Mr. William D. Balfour, Jr., Director
Department of Parks and Recreation
City and County of Honolulu
650 South King Street, 10th Floor
Honolulu, Hawaii 96813

Dear Mr. Balfour:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated May 5, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

1. We acknowledge your comment that the proposed landscaped plantings and descriptions presented in the environmental assessment are acceptable.

2. A mauka-makai linear parkway which includes a trail and open space park with pavilion and imu facilities is planned at Kalawahine Streamside. This 1.2-acre parkway system will be owned and maintained by DHHL and the homeowners association for the new development. The requirement under Park Dedication Ordinance No. 4621 for 95 residential units is 33,250 square feet. While we exceed the City and County of Honolulu's requirements for park dedication, we would like to note that the Department has elected to exercise its exemption power from County ordinances.

Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

0000 0026 2816

Contact: Ms. Michele Utake

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4341 • FAX: (808) 527-5857

DEPT. OF HAWAIIAN HOME LANDS
MAY 6 8 11 AM '98

JEREMY HARRIS
MAYOR

JONATHAN K. SHIMADA, PhD
DIRECTOR AND CHIEF ENGINEER
ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR

ENV 98-094

April 30, 1998

Mr. Kali Watson, Director
Department of Hawaiian Home Lands
State of Hawaii
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Watson:

Subject: Draft Environmental Impact Statement (DEIS)
Kalawahine Streamside
TMK: Various

We have reviewed the subject DEIS and have the following comments:

1. Because of the limited flow capacity downstream, particularly the Makiki Ditch, no increase in run-off from the proposed site will be allowed.

2. A soils report to determine the suitability of area for development and slide potential is required.

3. Under City Ordinances, property owners are responsible for maintenance of streams on their property. Who will be responsible for operating and maintaining the proposed parkway system?

4. The City has received numerous complaints of dumping into some sections of Kanaha Stream. Therefore, measures should be made to ensure that the owners are aware of the legal responsibilities they have with the parkway located within their lots.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

JONATHAN K. SHIMADA, PhD
Director and Chief Engineer

cc: OEQC
PBR Hawaii (Yukie Ohashi)

0000 0026 28 17

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 8, 1998

Jonathan K. Shimada, Ph.D., Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Dr. Shimada:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated April 30, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

1. Detention basins and other means of retaining run-off will be considered in the final design of the project. The project's civil engineer will coordinate our plans with your department to achieve no net increase in run-off.

2. A soils study for the project is currently being prepared by the soils engineer. Preliminary findings indicate that from a geotechnical viewpoint, the site is generally suitable for development. Slide potential throughout most of the site is low as the area is covered by only a thin layer of silty clay overlying weathered rock and weathered volcanic cinder strata. In the lower sections of the site, the surface layer of silty clay is thicker and mixed with numerous cobbles and boulders. The stability of slopes planned in the lower section of the site is being evaluated as part of the soils study, and if necessary, mitigative measures to reduce the potential for sliding will be included in the construction plans.

3. DHHL will maintain ownership of the parkway and Kanaha Stream. Individual homestead property boundaries will border the parkway trail system but not include this public area. A new homeowners association for the project will maintain the park and walking trail.

4. The formation of a homeowners association for the new homes will result in the establishment of rules which will address littering and dumping in Kanaha Stream. These rules will be enforced by the homeowners association and/or DHHL.

Your comments have been addressed in the Final EA report. Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

0000 0026 28 19

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6663 • FAX: (808) 527-6675

JEREMY HARRIS
MAYOR

KENNETH E. SPRAGUE, P.E., Ph.D.
DIRECTOR

CHERYL K. OKUMA-SEPE, ESQ.
DEPUTY DIRECTOR

In reply refer to:
WCC 98-79

April 20, 1998

Mr. Kali Watson, Director
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Watson:

Subject: **Draft Environmental Assessment**
Kalawahine Streamside, Dated March 1998
TMK: 2-4-34:Por.8,Por.9,11&22; 2-4-39:1&2; 2-4-40:1; 2-4-42:Por.1&37

We have no objection to the proposed 98 home development (22 single family homes and 76 duplex family homes). A Sewer Connection Application form was approved on January 29,1998, for only 97 homes. A revised Sewer Connection Application form is required. This project is liable for a Wastewater System Facilities Charge.

If you have any questions, please contact Ms. Tessa Ching of the Service Control Branch at 523-4956.

Sincerely,

Cheryl K. Okuma-Sepe

KENNETH E. SPRAGUE
Director

cc: OEQC

0000 0026 2820

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 8, 1998

Mr. Kenneth E. Sprague, Director
Department of Wastewater Management
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Sprague:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated April 20, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project. We note that your agency has no objection to the development.

The Sewer Connection Application which was approved for the project on January 29, 1998 was for 97 homes. Although the Draft EA described 98 homes, we have revised the number of dwellings to a current final total of 95 based on the detailed topographic survey which was recently completed for the project. Therefore, the permit issued in January should remain valid.

Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

0000 0026 2821

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813-3017
PHONE: (808) 523-4533 • FAX: (808) 523-4950

JEREMY HARRIS
MAYOR

PATRICK T. ONISHI
CHIEF PLANNING OFFICER

DONA L. HANAIKE
DEPUTY CHIEF PLANNING OFFICER

RR 4/98-0755

April 22, 1998

Honorable Kali Watson, Director
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Watson:

Draft Environmental Assessment (DEA) for Proposed
Kalawahine Streamside Residential Subdivision
Tax Map Keys: 2-4-34:08 (por.), 09 (por.), 11 & 22;
2-4-39:01 & 02; 2-4-40:01; and 2-4-42:01 (por.) & 37

In response to PBR Hawaii's request on behalf of the Department of Hawaiian Home Lands, we have reviewed the above DEA with regard to the proposed project's impacts on the City and County of Honolulu's General Plan and the Primary Urban Center Development Plan and its Special Provisions.

The project area is classified as Preservation under the Development Plan Land Use Map and is currently zoned P-2 General Preservation. The area is also within the Punchbowl Special District. Development of the project area would require changes in Development Plan and zoning designations. The surrounding land uses are residential in nature, bounded by R-5 and R-10 lands. The site is currently primarily vacant land that does not provide recreational or watershed preservation purposes. Its location is suitable for residential development and appears to be appropriate for this purpose given the surrounding land uses.

While the project does not conform to current land use designations, we find the project to be consonant with the overall intent and visions of the General Plan and the Development Plan, especially as they pertain to providing affordable housing.

Should you have any questions, please contact Robert Reed of our staff at 523-4402.

Yours very truly,

PATRICK T. ONISHI
Chief Planning Officer

PTO:ft

c: OEQC
PBR Hawaii

0000 0026 2823

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 8, 1998

Mr. Patrick T. Onishi, Chief Planning Officer
Planning Office
City and County of Honolulu
650 South King Street, 8th Floor
Honolulu, Hawaii 96813-3017

Dear Mr. Onishi:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated April 22, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project. We note that your agency has determined that the project is consonant with the overall intent and visions of the City and County of Honolulu's General Plan and the Development Plan, especially as they pertain to the provision of affordable housing.

Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

0000 0026 2824

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

REPLY TO
ATTENTION OF

May 1, 1998

Civil Works Branch

Mr. Kali Watson, Director
Department of Hawaiian Home Lands
City and County of Honolulu
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Watson:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Kalawahine Streamside Project, Honolulu, Hawaii. The following comments are provided in accordance with U.S. Army Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Any work performed in or around Kanaha Stream may require a DA permit. For further information, please contact Mr. Peter Galloway of our Regulatory Section at 438-9258 (extension 15) and refer to file number 980000176.

b. The flood hazard information provided on page 31 of the DEA is correct.

Sincerely,

Paul Mizue, P.E.
Chief, Civil Works Branch

0000 0026 2825

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 11, 1998

Mr. Paul Mizue, P.E., Chief
Civil Works Branch
Department of the Army
U.S. Army Engineering District, Honolulu
Ft. Shafter, Hawaii 96858-5440

Dear Mr. Mizue:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated May 1, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following response to your comments.

We have consulted with staff at your Regulatory Branch and will be requesting additional consultation as we plan the design for the project's access road across Kanaha Stream.

Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

0000 0026 2826

The Senate
The Nineteenth Legislature
of the
State of Hawaii

STATE CAPITOL
HONOLULU, HAWAII 96813

May 8, 1998

Mr. Kali K. Watson
Director, Department of Hawaiian Home Lands
Old Federal Building
335 Merchant Street, Third Floor
Honolulu, Hawaii 96813

Dear Mr. Watson:

Re: Comments on the Draft Environmental Assessment for the Kalawahine Streamside Project

Enclosed for your staff's review are comments on the Draft Environmental Assessment ("DEA") for the Kalawahine Streamside project. The project, sponsored by the Department of Hawaiian Home Lands (DHHL), proposes to build a 98-unit subdivision to serve the housing needs of native Hawaiians. The Kamehameha Investment Corporation (KIC) is expected to be the developer of the project.

If the project is developed, it could adversely affect existing neighboring communities near Kalawahine Stream. Accordingly, district legislators sponsored two community briefings in March of 1998 to provide project managers and developers, DHHL, KIC, and PBR Hawaii (the landscape architect who prepared the DEA), an opportunity to respond to questions and concerns relating to the Kalawahine Stream project.

A summary of the comments and concerns expressed by residents and community representatives who live near the project site is outlined below:

1. Vehicular Access

In contrast to the original decision to include two access streets on Kapahu Street to provide access to and from the proposed subdivision, only one access road has been proposed. While Kapahu Street would have to be extended to accommodate additional vehicular use to and from the project, only one entrance/exit has been proposed for the 98-unit housing project on Kapahu Street. Traffic congestion in this area would increase during the day, when vehicular ingress and egress activity is the heaviest.

2. Traffic, Noise, Air Quality

The additional 98 units would increase traffic congestion by 185%, resulting in an increase in traffic from 45 to 83 vehicles per hour during peak hours. While below the national standard of 100 vehicles per hour[1], the estimated 242% increase in peak hour delay per vehicle from 2.6 to 6.3 seconds on Anianik Street, between Auwaiolimu Street and Kapahu Street, is significant.

Because the existing Kapahu Street is one lane wide and allows parallel parking on both sides of the street, added traffic with the new project would greatly increase traffic congestion in the area. In other words, drivers on either end of Kapahu Street will be delayed because of the likely need to yield on one side of the road for oncoming cars. Thus, traffic flow with the added traffic from the Kalawahine Streamside project would likely be impeded.

More vehicles and higher levels of car emissions would also increase noise and air pollution in the project area.

3. Flood Risks

While flows from Kanaha Stream are classified as "intermittent," residents of the area are concerned with the potential danger of flood overflow in case of flash flood conditions, given that runoff from the pipes of the proposed subdivision drainage system will flow towards the stream. These residents want an assessment of the risk of flood to their homes, due to their proximity to Kanaha Stream. If such a risk is probable, then the residents would like to develop plans with the appropriate Civil Defense agencies to prepare for such floods.

4. Soil Erosion

Off-site homeowners in the area have reported that soil erosion during high rainfall periods have caused significant damage to their homes. These residents' concerns are based on the unstable soil type and steep slope elevation surrounding the project. According to page 25 of the DEA, the soil types and their corresponding slopes, TCE and KanE, are located near the project site and are prone to moderate to severe levels of runoff and of soil erosion.

5. Affordability of Units

Due to steeper topography and shaky soil conditions, the cost of building hillside homes is more expensive than other DHHL housing projects. As such, several residents expressed concerns that these homes would be built at prices beyond affordable levels for the project's target group, thus resulting in a glut of unsold units.

6. Additional Development

Concerns were raised about additional development in the areas that abut the subdivision, especially around Kalawahine Place. Because property lot lines for the project's units extend up to the boundaries of existing homes on Tantalus Drive and to those properties of Kalawahine Place, Tantalus residents have expressed concerns about the potential for further development on individual lots.

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[1]This standard was established by the Institute of Traffic Engineers to determine the need for traffic site remediation.

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7. Infringement on Existing Tantalus Lots

   Kanaha Stream is the primary natural feature that separates the project from the homes along Tantalus Drive and Kalawahine Place (the hillside above the project). Because the topography of the area is steep, Tantalus residents attending the March 1998 community briefings have expressed concerns about visual and construction impacts on Tantalus Drive residences and properties.

8. Water and Sewer Capacity

   Residents are concerned that the formula used to determine the project's need for water and sewer capacity was inadequate. Lower Papakolea residents stated that the appropriate standard would be the "ohana family size" (40% greater, 5.5 person/household) criterion, which would more accurately reflect those traditionally larger families who live in DHHL housing.

In light of the many questions posed during our Tantalus/Makiki Heights community briefings, I urge the Department of Hawaiian Home Lands and its project development team to respond to community concerns prior to the implementation of this project. Thank you for the opportunity to submit these comments.

Sincerely,

Carol Fukunaga

Carol Fukunaga
State Senator, 12th District

cc.: Tantalus Community Association
Makiki/Lower Punchbowl/Tantalus NB #10

0000 0026 2829

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 11, 1998

To: The Honorable Carol Fukunaga
Hawaii State Senate

From: Kali Watson, Chairman
Hawaiian Homes Commission

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated May 8, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project.

An extensive community awareness program to inform the area residents of the project has been undertaken by our Department and the Kamehameha Investment Corporation, the developer of the project. This effort has resulted in an informed understanding of the project, clarification of issues, and study of alternative suggestions from community individuals. The meeting dates are provided for your information.

March 4, 1998	Papakolea Community Association (Meeting with Board Members)
March 5, 1998	Papakolea Community Association - Informational meeting
March 27, 1998	Kewalo neighborhood - Hand-delivered project summary and notification of March 30, 1998 Informational Meeting
March 29, 1998	Papakolea neighborhood - Hand-delivered project summary and notification of March 30, 1998 Informational Meeting
March 30, 1998	Papakolea and Kewalo neighborhoods - Informational Meeting
March 31, 1998	Makiki residences, principals and teachers - Informational Meeting (Notified by Senators Carol Fukunaga and Rod Tam)
April 11, 1998	Senator Rod Tam and community task force - Walk through of project site
April 16, 1998	Makiki/Lower Punchbowl/Tantalus Neighborhood Board No. 12 - Presentation of project
April 21, 1998	Nuuanu/Punchbowl Neighborhood Board No. 12 - Presentation of project
April 24, 1998	Papakolea and Kewalo neighborhoods - Mailed flyer addressing community concerns and notification of April 30, 1998 meeting

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April 30, 1998 Papakolea and Kewalo neighborhoods - Follow-up Informational Meeting

We have reviewed the comments contained in your letter and offer the following responses.

1. **Vehicular Access.** In developing the master plan we evaluated access to the project site from Iaukea Street and Kapahu Street. Our studies have indicated that the topographical constraints of the Iaukea Street area would not allow a feasible access at this location. Therefore, access is now planned only from an extension of Kapahu Street. We have further evaluated the traffic conditions in the Kewalo neighborhood. Additional traffic counts by the project traffic engineer further validates our conclusion that the additional 95 homes (reduced from 98) will not adversely affect traffic feeding to Auwaiolimu Street during the peak morning hour of traffic. We have also evaluated the project based on a higher average household size commonly found in Hawaiian Home Lands residences. Our findings indicate that under existing conditions, when two vehicles traveling in opposite directions wish to use the same segment of street, one driver must yield by pulling over wherever possible to let the other pass. The average peak hour delay due to this constraint has been estimated to be 4.0 seconds per vehicle on Anianiku Street between Auwaiolimu Street and Kapahu Street. With the projected increase in traffic volume, the peak hour delay on the same street segment with the addition of project traffic has been estimated to increase to 9.2 seconds. Peak traffic conditions with the new project will more likely flow in the same direction, thereby, lessening the impact of vehicles traveling in opposite directions.

Manual traffic counts were conducted during peak hours at the entrances to the Kewalo neighborhood. Usually no more than one vehicle waited for the signal at Anianiku Street. Of the 200± cycles observed during the field counts, there were two vehicles waiting 11 times and three waiting two times.

At this time, we are discussing mitigative measures with the residents of the area. One alternative would be a one-way street pattern from Auwaiolimu Street that would convert Kapahu Street and Anianiku Street to one-way to allow

uninterrupted traffic flow on the narrow streets. This is being discussed with the existing residents in the Kewalo neighborhood and would be implemented only if warranted by a thorough study by the Department of Transportation Services.

2. **Traffic, Noise, Air Quality.** Your concerns regarding traffic flow along the narrow streets in the neighborhood are addressed above. Regarding the potential for increased noise and air pollution, we recognize that as growth within the area takes place, ambient levels will increase. However, the project is not expected to exceed the standards established by the State Department of Health.

3. **Flood Risks.** The Kalawahine Streamside project is not expected to increase runoff to Kanaha Stream. The project will comply with the requirements of the City and County of Honolulu Department of Public Works, the approving agency for drainage controls, and will design all improvements to assure that any approval will meet the County standards for design and safety.

4. **Soil Erosion.** The preliminary findings of the soils engineer indicate that from a geotechnical viewpoint, the site is generally suitable for development. Slide potential throughout most of the site is low as the area is covered by only a thin layer of silty clay overlying weathered rock and weathered volcanic cinder strata. In the lower sections of the site, the surface layer of silty clay is thicker and mixed with numerous cobbles and boulders. The stability of slopes planned in the lower section of the site is being evaluated as part of the soils study, and if necessary, mitigative measures to reduce the potential for sliding will be included in the construction plans.

   Landscaping will establish permanent ground cover to hold soils in place and will include grassed lawns and native and ornamental shrubs and trees. These measures will prevent soil erosion over the long term.

5. **Affordability of Units.** The DHHL wait-list for homestead awards presently includes approximately 29,000 applications, of which approximately 6,000 are for residential awards on Oahu. The SMS survey data showed that 49 percent of applicants earn annual incomes above $40,000 and should be able to afford these homes. The financing options will

include low interest loans, which will make the homes affordable to the qualified people on the wait-list. This project is expected to provide quality homes within minutes from downtown Honolulu. For many native Hawaiians on the wait-list who desire to live in urban Honolulu rather than rural areas such as Waimanalo and the leeward coast where residential homes have been available, the Kalawahine Streamside project represents a unique opportunity for homeownership in the primary urban center.

6. **Additional Development.** The project master plan does not include lots at Kalawahine Place. Our early investigations for the overall project considered six lots at Kalawahine Place, however, that concept has been dropped because of the inadequacies of Kalawahine Place. None of the lots will abut Tantalus Drive. The back pali wall will remain as vegetated open space.

7. **Infringement on Existing Tantalus Lots.** The homes at Kalawahine Streamside will be built on the lower, gentler slopes consisting of about 15 acres of the 26.5-acre site. As planned, the construction zone is between 160 feet and 300 feet mean sea level (msl). By contrast, Tantalus Drive at the location of the project is at elevation 490 feet msl. The nearest home is located out of view from the project site, therefore, there will not be any visual impact on Tantalus Drive homes.

8. **Water and Sewer Capacity.** The water and sewer requirements for the project are being coordinated with the City agencies responsible for the infrastructure allocation. All new project infrastructure will consequently be designed to the City's requirements.

We have addressed your comments in the Final EA. Thank you for participating in the environmental review process.

0000 0026 2833

2070 Kalawahine Place
Honolulu, HI 96822

May 7, 1998

Mr. Gary Gill
Office of Environmental Quality Control
235 S. Beretania #702
Honolulu, Hawaii 96813

'98 MAY -8 A11:52

OFC. OF ENVIRONMENTAL QUALITY CONTROL

Re: Kalawahine Streamside Proposal

Dear Mr. Gill:

I just learned today that May 8, 1998, is the deadline for comment on the Kalawahine Streamside proposal submitted by Kamehameha Investment Corporation. I hope you will consider my thoughts on this matter even though this letter is a bit late.

Although I am a resident of Kalawahine Place, I did not receive notice of the public meeting. My neighbor gave me a copy of the Draft Environmental Assessment. The project itself seems to be well-thought out but I have a concern about this paragraph in a three page summary prepared by Kamehameha Investment Corporation entitled "General Project Information." It reads as follows:

> There are two alternatives for DHHL to consider including more units in Alternative 1 and less units at a reduced cost in Alternative 2. As part of the process but not included in the base proposal or in the alternatives, KIC will pursue developing six lots off Kalawahine Place. Delivering affordable units under the 201E, Hawaii Revised Statutes process might allow these units to be built without major improvements to Kalawahine Place. With access and utilities there, it only makes sense to utilize the site and frontage. If six units could be developed, DHHL funding per unit would obviously decrease.

These six possible units do not appear to be considered in the Draft Environmental Assessment. I would like to know exactly where these six units are being planned. Kalawahine Place is a single lane road and cannot accomodate more traffic. In the past the area had been designated a watershed. Has that designation changed?

Can you please advise me regarding this possible development? As a homeowner on Kalawahine Place, I am concerned and would like to be informed about any hearings and/or meetings regarding this whole development.

Thank you for your attention.

Yours sincerely,

Arlene G. Woo

cc: Senator Carol Fukunaga
Kamehameha Investment Corporation

0000 0026 2834

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 11, 1998

Ms. Arlene G. Woo
2070 Kalawahine Place
Honolulu, Hawaii 96822

Dear Ms. Woo:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated May 7, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

The proposed Kalawahine Streamside project will not include any lots at Kalawahine Place. All 95 homes will be on the lower portion of the project site and will be accessible from an extension of Kapahu Street in the Kewalo neighborhood.

Our early discussions of the overall Kalawahine Streamside project included a concept that considered six lots at Kalawahine Place. However, that concept has been dropped because of the inadequacies of Kalawahine Place.

Community informational meetings have been held with the Papakolea and Kewalo neighborhoods because of the proximity of the project to those neighborhoods. An informational meeting on the project was called by Senators Carol Fukunaga and Rod Tam on March 31, 1998. It is our understanding that notice of this meeting was sent to residents on Kalawahine Place and the general Makiki Heights community. In addition, presentations were made to the Nuuanu and Makiki Neighborhood Boards.

Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

May 07, 1998
EA:00173

Yukie Ohashi
PBR Hawaii
Pacific Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Yukie Ohashi:

Draft Environmental Assessment
Kalawahine Streamside
Honolulu, Oahu

The Department of Hawaiian Home Lands proposes to develop 98 dwelling units which include 22 single-family, 76 duplex-family homes and recreational opportunities for project residents.

We reviewed this draft Environmental Assessment (EA) with the assistance of Paul Ekern, Agronomy and Soil Science Emeritus; and Tori Cullins of the Environmental Center.

Soils

This hillside project is proposed to be built on a slope of substantial grade. Our reviewers express great concern with the slide potential inherent in an area containing soils of the Kaena type (page 25). Table 3 of the Soil Survey exprcsses engineering properties that should be discussed in depth.

The Kaena Soil present in the Kalawahine project area is one of the red-black complex soils formed on the valley walls by seepage zones, hence the plastic 2:1 clays. This same soil type occurs at the Woolsey Place in Manoa (see Evan and Hummel, 1986, Review of Proposed Improvements to the Area Near Woolsey Place, Manoa, Oahu,

Hawaii) and in Palolo Valley, both of which areas have had significant problems with landform instability.

The Draft EA lacks sufficient diagrams and maps to evaluate both present and future slide potential and delineate the boundaries of the slide area to ensure that City has isolated the problem and proposed an extensive remedy for potential hillside movement.

The project plans must also contain a substantive discussion on the issue of homeowner displacement should a destructive landslide occur. Who will pay the homeowners for the loss or for costs of rebuilding their homes? Will these costs be passed on the taxpayers of this state?

Our reviewers also noted a number of omissions and inconsistencies within the draft EA. Appendix A, page 6 on the soils is missing. Also, the soils descriptors rainfall values are not in agreement with the 24 inch annual rainfall in the climate section for this study, page 24 Section 4.1.2.

Traffic

We note also that addition of 98 dwelling units with attendant traffic feeding into Auwaiolimu Street will add to a thoroughfare already heavily congested during morning rush hours. Further discussion of this issue should be included in the final document.

Conclusion

In the opinion of our reviewers, this project meets the significance criteria under Department of Health, 11-200-12 HAR; requiring preparation of an Draft Environmental Impact Statement. We find grounds under subsection (4) whereas a project "substantially affects the economic or social welfare of the community or State," and subsection (11) whereas a project "Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion prone area, geologically hazardous land, estuary, fresh water, or coastal waters."

Sincerely,

John T. Harrison
Environmental Coordinator

c: OEQC
Roger Fujioka
Kamehameha Investment Corporation FAX 599-3952
Department of Hawaiian Home Lands FAX 586-3923
Paul Ekern
Tori Cullins

0000 0026 2837

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

May 11, 1998

Mr. John T. Harrison, Environmental Coordinator
University of Hawaii
Environmental Center
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Mr. Harrison:

Subject: Response to Comments on the Kalawahine Streamside Draft Environmental Assessment, TMK# (1) 2-4-34:08 (por.), 09 (por.), 11, and 22; (1) 2-4-39:01 & 02; (1) 2-4-40:01; and (1) 2-4-42:01 (por.) & 37, Honolulu, Oahu, Hawaii

We have reviewed your letter dated May 7, 1998 regarding the Draft Environmental Assessment for the Kalawahine Streamside project and offer the following responses to your comments.

1. Soils. A soils study for the project is currently being prepared by the soils engineer. Preliminary findings indicate that from a geotechnical viewpoint, the site is generally suitable for development. Slide potential throughout most of the site is low as the area is covered by only a thin layer of silty clay overlying weathered rock and weathered volcanic cinder strata. In the lower sections of the site, the surface layer of silty clay is thicker and mixed with numerous cobbles and boulders. The stability of slopes planned in the lower section of the site is being evaluated as part of the soils study, and if necessary, mitigative measures to reduce the potential for sliding will be included in the construction plans. The final report will contain the boring logs showing the results of the soil borings and the engineering requirements for the project. Upon its completion, the soils study will be submitted to the Department of Public Works. In addition, all grading activities will be approved by the City prior to construction.

   Your reference to the soil instability examples at Manoa

Valley (i.e. Woolsey Place) and Palolo Valley is acknowledged. Kaena very stony clay (KanE) at this location is characterized by its shallow nature in the upper areas and is underlain by rock. Due to the grading proposed, most of the buildings on the uphill side of the road will be built on the underlying rock, while on the lower side of the road, foundations will be founded on select granular material. We note that the problems experienced at Manoa and Palolo are not comparable to the subject site because of the differences in the thickness of the silty clay layer.

2. Traffic. Additional traffic counts by the project traffic engineer confirms our prior conclusion that the additional 95 homes (reduced from 98 described in the Draft EA) will not adversely affect traffic feeding to Auwaiolimu Street during the peak morning hour of traffic. The recent counts were based on a maximum of 97 units and further evaluated for a higher average household size commonly found in Hawaiian Home Lands residences.

Our findings indicate that the greatest traffic impact of the project on Auwaiolimu Street would be 99 vehicles per hour in the peak direction. An estimated 80 percent of the traffic generated by the project would travel to or from the makai direction on Auwaiolimu Street. Traffic impact on Auwaiolimu Street would be less than 100 vehicles per hour in both directions. The project impact is not expected to be significant. The increase in traffic, even on a worst-case basis would be less than the "100 added vehicle trips in the peak direction (inbound or outbound) during the site's peak traffic hour" that the Institute of Transportation Engineers has suggested as a criteria for a site traffic access or impact study.

3. Significance Criteria.

Subsection (4). This project has the potential to substantially improve the economic and social welfare of the community and the State. Of the approximately 29,000 DHHL homestead applications currently on file, approximately 6,000 are for residential awards on Oahu. While opportunities for residential homeownership has been available in rural areas of Oahu, this is the first offering in urban Honolulu since the 1950's. This project is

expected to provide quality homes within minutes from downtown Honolulu. For many native Hawaiians on the wait-list who desire to live in urban Honolulu, the Kalawahine Streamside project is an unique opportunity.

Subsection (11). Although your letter does not indicate a specific environmentally sensitive area, we are assuming this reference is to the Kaena soils on the property. I believe we have addressed this concern in Item Number 1 above. We therefore, believe that a Finding of No Significant Impact (FONSI) is appropriate for this project and no environmental impact statement (EIS) is required.

Thank you for participating in the environmental review process.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

8.0 References

8.0 REFERENCES

Alu Like, Inc., Research, Planning and Evaluation Unit. *Profiles of Study Area within the Hawaiian Home Lands based on 1990 Census Data.* June 1993

Armstrong, R. W. ed. *Atlas of Hawai'i.* 2nd edition. Honolulu: University of Hawai'i Press, 1983.

Baker, H.L. et al. *Detailed Land Classification, Island of Hawai'i.* L.S. Land Study Bureau, University of Hawai'i, 1965.

City and County of Honolulu, Department of Land Utilization. *Land Use Ordinance.* Honolulu, Hawai'i. 1997.

Cleghorn, P. Letter Report Regarding Reported Burials in the Kalāwahine Project Area. March 12, 1998.

Group 70 International, *Site Assessment and Feasibility Reports, Kalāwahine, Moreira Dairy Farm and Waimānalo, O'ahu, Hawai'i.* Prepared for Department of Hawaiian Home Lands. Honolulu, Hawai'i. (Draft) 1992.

Hawai'i State Department of Agriculture. *Agricultural Lands of Importance to the State of Hawai'i.* Honolulu, Hawai'i. 1977.

Hawai'i State Department of Agriculture. *Agricultural Lands of Importance to the State of Hawai'i.* Honolulu, Hawai'i. 1977.

Hawai'i State Department of Land and Natural Resources Historic Preservation Division. "Memorandum to Department of Hawaiian Home Lands." January 31, 1992.

Hawai'i State Department of Budget and Finance, Housing Finance and Development Corporation. *Hawai'i State Plan, Housing Functional Plan.* 1989.

Hawai'i State Department of Budget and Finance, Housing Finance and Development Corporation. *Hawai'i State Plan, Addendum to the State Housing Functional Plan.* 1990.

Kolb, M.J., C.A. Mitchell, P. Conte, M. McFadden. Hawai'i State Department of Land and Natural Resources Historic Preservation Division. *Archaeological Inventory Survey in Kalāwahine 'Ili, Honolulu Ahupua'a, Kona District, Island of O'ahu.* Honolulu, Hawai'i. 1993.

Nagata, K. M. *Kalāwahine Streamside Botanical Assessment.* Honolulu, Hawai'i. 1998.

Ohashi, T.J. Wildlife Survey, *Kalāwahine Streamside Project, Papakōlea, Island of O'ahu.* Honolulu, Hawai'i. 1998.

PBR HAWAII. *Hawaiian Home Lands: Land Assessment Studies, Phases 1, 2 and 3.* Prepared for Department of Hawaiian Home Lands. Honolulu, Hawai'i, 1991.

PBR HAWAII. *Hawaiian Home Lands: Land Assessment Studies, Phase 5 – Planning Assessment: Total Land Inventory.* Prepared for Department of Hawaiian Home Lands. Honolulu, Hawai'i, 1993.

Sato & Associates, Inc. *Drainage Report for Existing Kanahā Stream Adjacent to Proposed Kalāwahine Streamside, TMK: 2–4–34.* Prepared for Kamehameha Investment Corporation. Honolulu, Hawai'i, 1998.

SMS Research. *Department of Hawaiian Home Lands (DHHL) Beneficiary Needs Study.* Honolulu, Hawaii. September 1995.

United States Department of Agriculture Soil Conservation Service. *Islands of Kaua'i, O'ahu, Maui, Moloka'i, and Lāna'i, State of Hawai'i,* 1972.

United States Department of Commerce, Bureau of the Census. *1970 Census of Population and Housing: Census Tracts – Honolulu, Hawai'i, SMSA.*

United States Department of Commerce, Bureau of the Census. *1980 Census of Population and Housing: Census Tracts – Honolulu, Hawai'i, SMSA.*

United States Department of Commerce, Bureau of the Census. *1990 Census of Population and Housing, Population and Housing Characteristics for Census Tracts and Block Numbering Areas– Honolulu, Hawai'i, MSA.*

Appendices

0000 0026 2844

A. Drainage Report

0000 0026 2845

DRAFT

DRAINAGE REPORT

FOR

EXISTING KANAHA STREAM
ADJACENT TO
PROPOSED KALAWAHINE STREAMSIDE

TMK: 2-4-34

Prepared for:
Kamehameha Investment Corporation
567 South King Street, Suite 600
Honolulu, Hawaii 96813-3036

Prepared by:
Sato & Associates, Inc.
2046 South King Street
Honolulu, Hawaii 96826

March 1998

EXISTING KANAHA STREAM STUDY

Description

The Kanaha Stream runs from the Koolau Mountain Range toward Auwaiolimu Street and is bordered by the Papakolea Residence Lots on the west and the proposed project to the east. See Location Map.

No flood insurance study by the Federal Emergency Management Agency (FEMA) was found for Kanaha Stream.

Hydrologic and Hydraulic Calculations

The USGS map and 200 scale aerial topographical maps were used to determine the runoff area, stream sections, and slopes for the study. The tributary area for Kanaha Stream was determined to be 216 acres, as shown on EXHIBIT A.

For stream studies, the City and County of Honolulu requires using the peak discharge of a 100 year storm for analysis.

For tributary areas of greater than 100 acres, the City and County of Honolulu uses Design Curves for Peak Discharge vs. Drainage Area. See Plate 6. Using the Group B curve and a drainage area of 216 acres, the peak discharge of a 100 year 24-hour storm was projected to be 1350 cfs.

Based on 1350 cfs, an analysis of the stream was performed using the HEC-RAS, River Analysis System computer software. A 200 scale topographical map of Kanaha Stream and the surrounding area shows the stream baseline, cross sections, and approximate flood limits. See EXHIBIT B. The flood limits and the water surface encroachment lines are based on the 100 year 24-hour storm. A summary of the stream analysis is shown on EXHIBIT C. A profile of Kanaha Stream with the 100 year water surface profile is shown on EXHIBIT D. The cross sections of the stream with approximate locations of properties located near Kanaha Stream are shown in EXHIBITS E-1 to E-14. All cross sections are shown looking downstream.

Proposed Kalawahine Streamside

The proposed project will cover approximately 15 acres. Based on a 50 year recurrence interval storm, the calculations indicate an estimated flow increase of 20.7 cfs. The increase flow is about 1.53 percent during peak flow condition.

Therefore, the effects on the existing downstream improvements appear negligible.

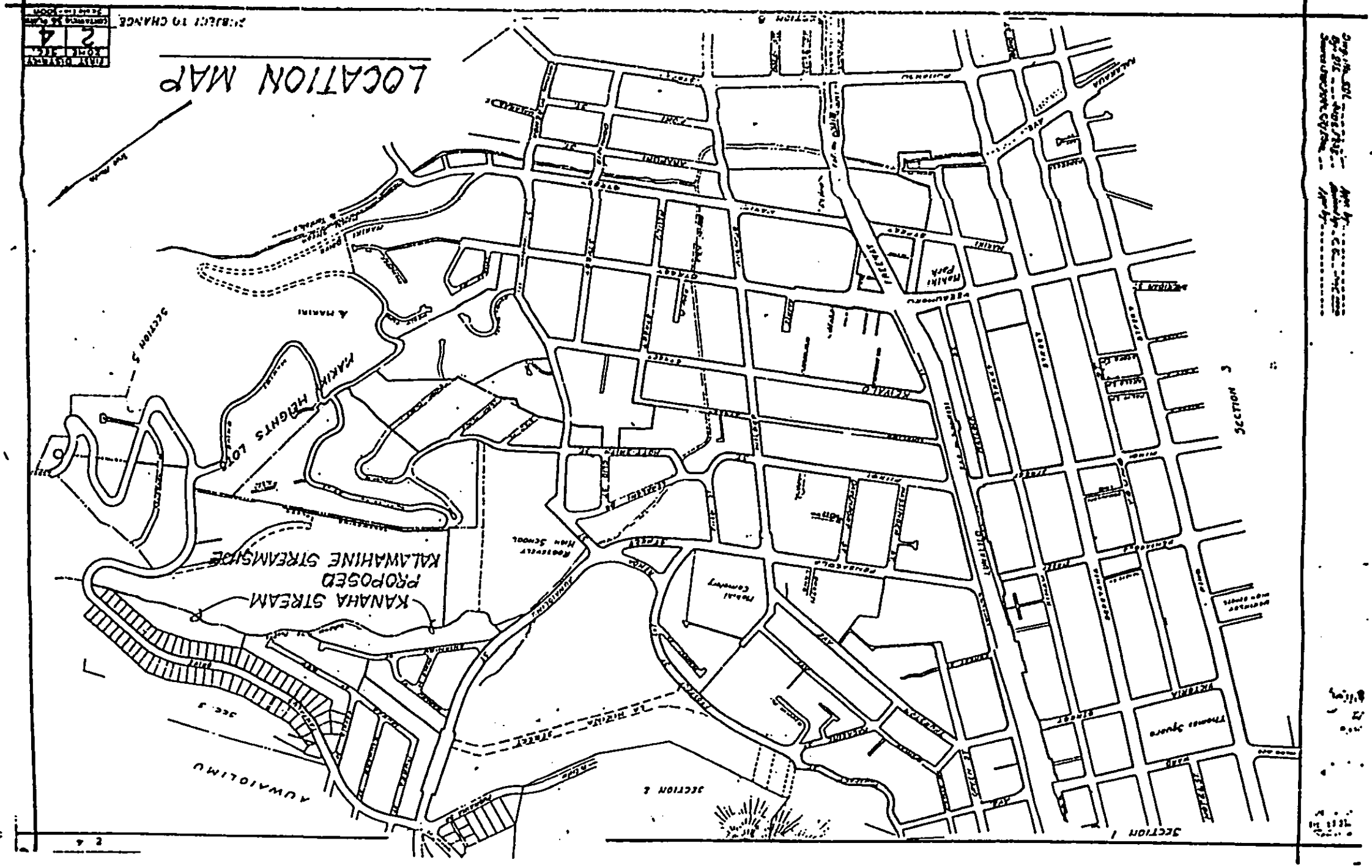
Access to the proposed Kalawahine Streamside development will cross over Kanaha Stream by way of a box culvert. The box culvert will be designed such that the calculated existing water surface elevation will not be increased during peak flow conditions.

The proposed dwelling units will be built outside of the peak stream flow area.

The drainage system for the proposed project will be designed and submitted to the Department of Public Works, Department of Land and Natural Resources, and the U. S. Army for their review and approval.

0000 0026 2848

APPENDIX



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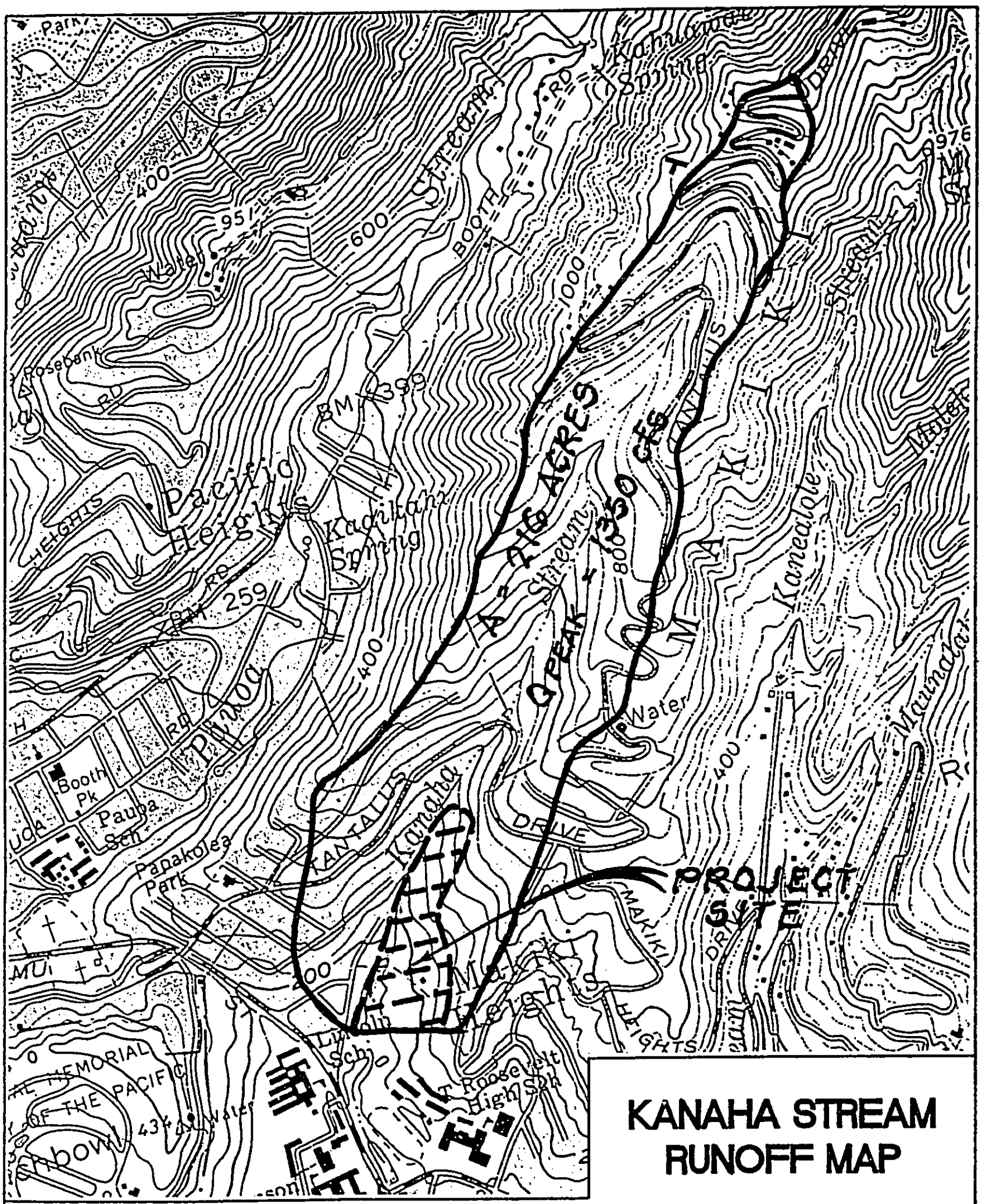


KANAHA STREAM RUNOFF MAP

REFERENCE: U.S.G.S TOPOGRAPHIC MAP OF THE ISLAND OF OAHU, HAWAII (1970)

EXHIBIT A

0000 0026 2851

Sato & Associates, Inc.
Consulting Engineers

Sheet: 1 Of:
By: Date: 3/4/98
Chkd. by: Date:

PROJECT: Kalawahine Streamside

Reference: Storm Drainage Standards
Department of Public Works
City and County of Honolulu
May 1988

Hydrology:

Area = 216 Acres (see Runoff Map)

Qpeak = 1,350 CFS (See C&C Plate 6)

Project site:

A = 15 ± Acres

Existing Runoff:

I_{50} = 3.0 Inches

C.F.: L = 1,760 LF

H = 325-130 = 195 FT

$K = \left[(1{,}760)^3 / 195 \right]^{1/2} = 5288$ (Plate 5)

T_c = 10 Min.

∴ C.F. = 2.3 (Plate 4)

C = 0.45 (Table 1)

$Q_{50} = CIA$

$= (0.45)(3.0 \times 2.3)(15)$ = 46.6 CFS
Exist. Runoff

Proposed Runoff:

I_{50} = 3.0 Inches

C.F. = 2.3

0000 0026 2852

Sato & Associates, Inc.
Consulting Engineers

Sheet: 2 Of:
By: Date: 3/4/98
Chkd. by: Date:

PROJECT:

$C = 0.65$ (Table 2)

$Q_{50} = (0.65)(3.0 \times 2.3)(15) = 67.3$ CFS
Proposed Runoff

Estimated Flow Increase:

$Q_{increase} = 67.3 - 46.6 = 20.7$ CFS
Est. Flow Increase

Conclusion:

Estimated Per Cent Increase during Peak Flow is 1.53 %. (20.7/1350 = 1.53%).

Therefore, the effects on the existing downstream improvements appear negligible.

0000 0026 2853

Sato & Associates, Inc. Consulting Engineers	Sheet: 3 Of: ____ By: ____ Date: 3/4/98 Chkd. by: ____ Date: ____
PROJECT:	

Stream Crossing Design (VIA Entrance Control)

Q_{peak} = 1350 CFS

Refer to Plate 20, Attached.

a = 9 Ft.

b = 14 Ft.

$Q/b = 1350/14 = 96.4$

$\therefore H/a = 1.1$

$H = 9.0 \times 1.1 = 9.9$ Ft.

USE 9'x 14' Box Culvert

Box Culvert invert shall be determine such that the existing Water Surface elevation will remain the same during peak flow condition.

0000 0026 2854

Sato & Associates, Inc.
Consulting Engineers

Sheet: ____ Of: ____
By: ____ Date: 3/4/98
Chkd. by: ____ Date: ____

PROJECT:

Retention Basin For Increased Flow

$Q_{increase}$ = 20.7 CFS

For 1 hr. rainfall:

100% retention Vol. = 20.7 × 60 × 60 = 74,520 C.F.

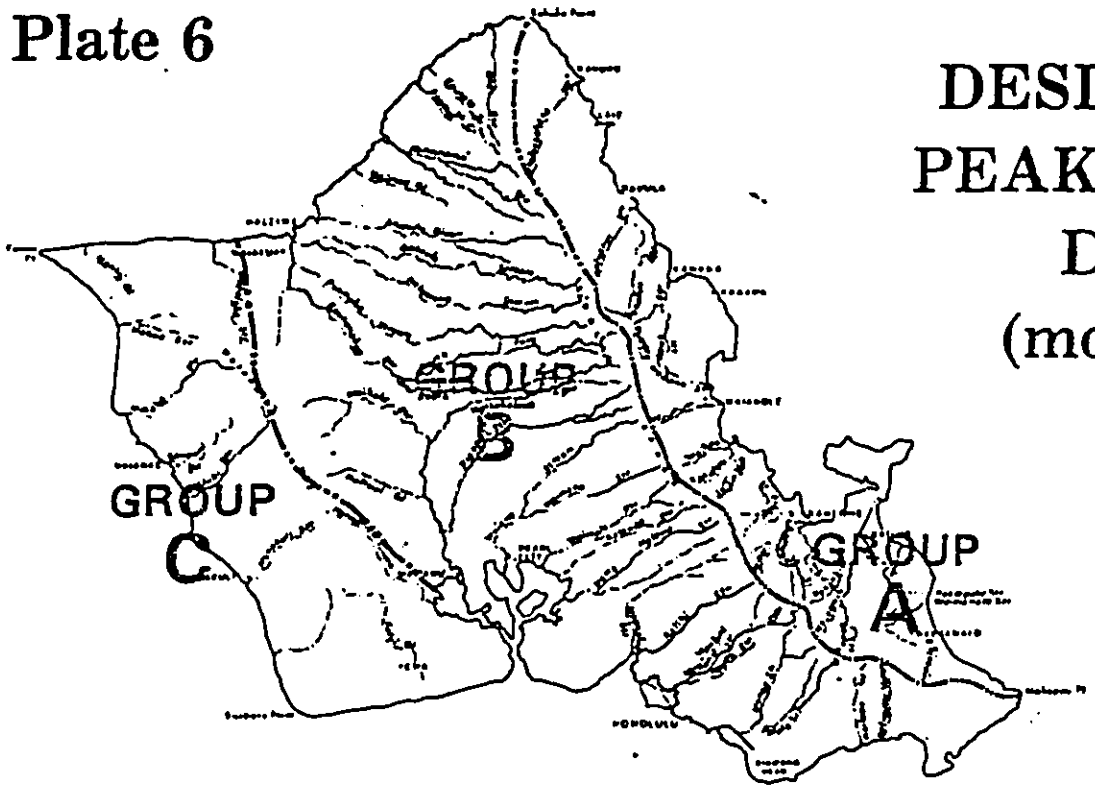
For 30 min. rainfall:

100% retention Vol. = 20.7 × 60 × 30 = 37,260 C.F.

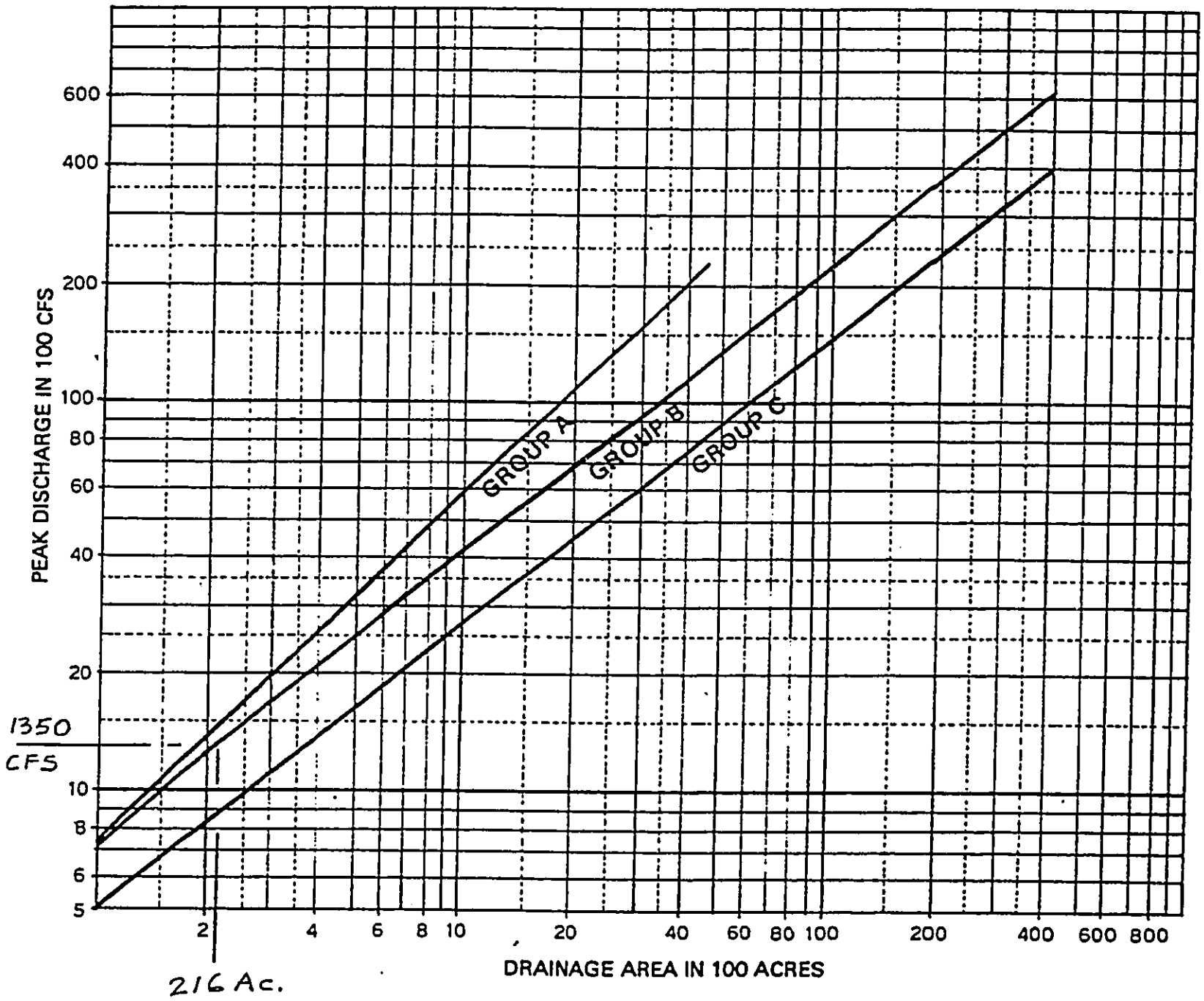
0000 0026 2855

Plate 6

DESIGN CURVES FOR PEAK DISCHARGE VS. DRAINAGE AREA (more than 100 acres)

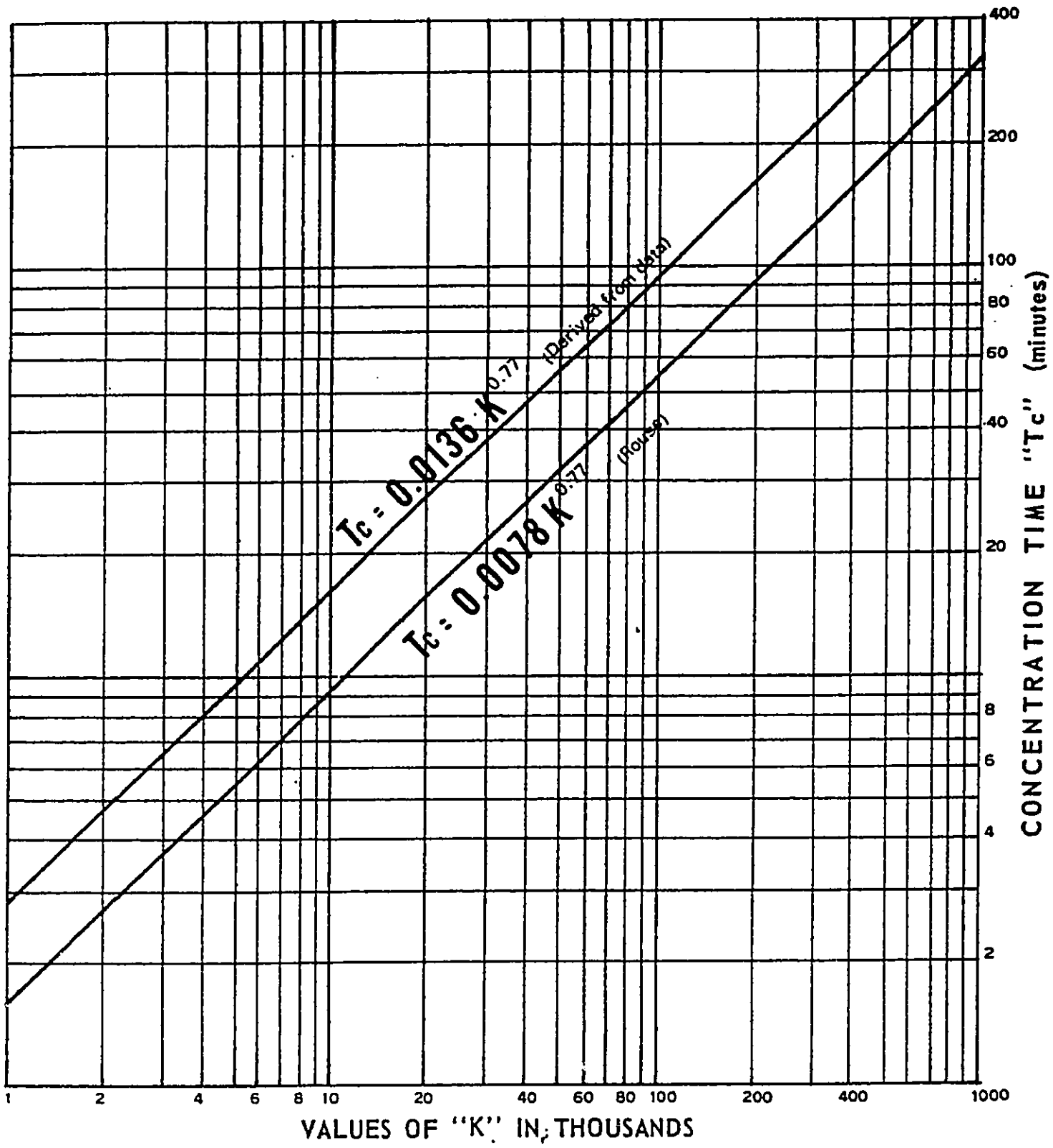


- CURVES ARE FOR STREAM CHANNELS AND DRAINAGE STRUCTURES.



SOURCE: DATA FROM U.S. GEOLOGICAL SURVEY

0000 0026 2856



L = Maximum length of travel in feet
H = Difference in elevation between most remote point and outlet in feet.
S = Slope H/L

$$K = \frac{L}{\sqrt{S}} = \sqrt{\frac{L^3}{H}}$$

Use upper curve for well forested areas
Use lower curve for areas with little or no cover.

SOURCE: CITY PLANNING COMMISSION
graph from Hunter Rouse "Engineering Hydraulics."

NOTE: Use 5 minutes if Tc is 5 minutes or less.

Plate 5

Time of Concentration

(OF SMALL AGRICULTURAL DRAINAGE BASIN)

Plate 3

Overland Flow Chart

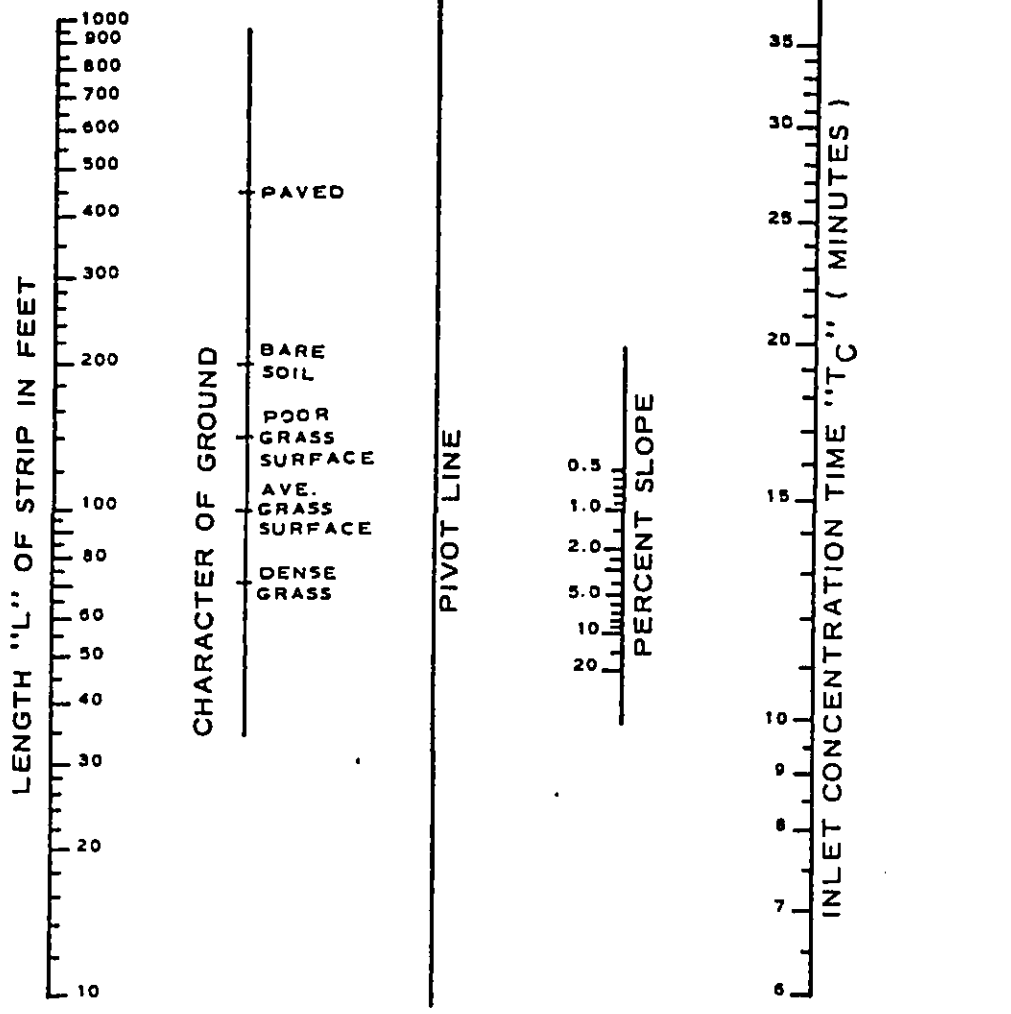
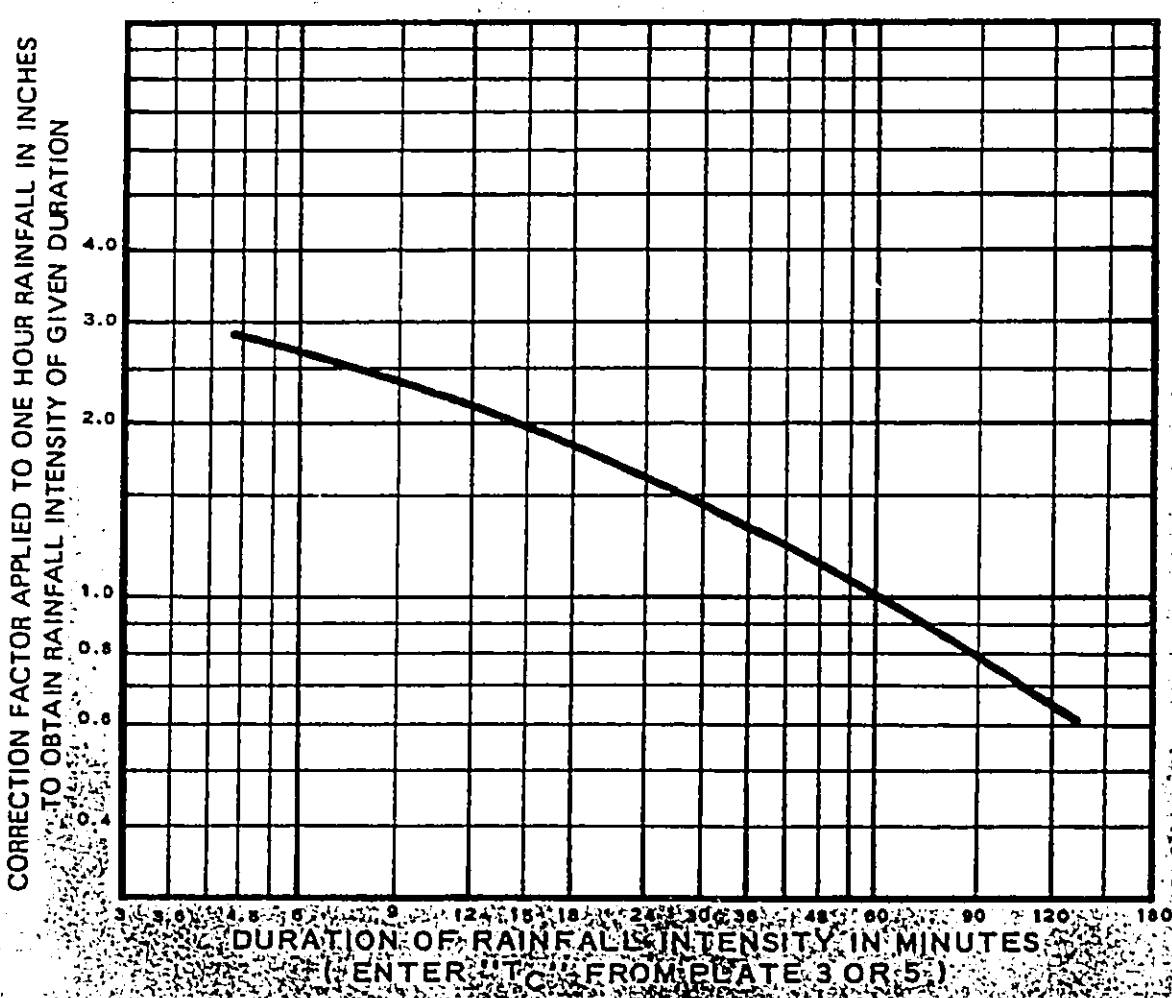


Plate 4



CORRECTION FACTOR

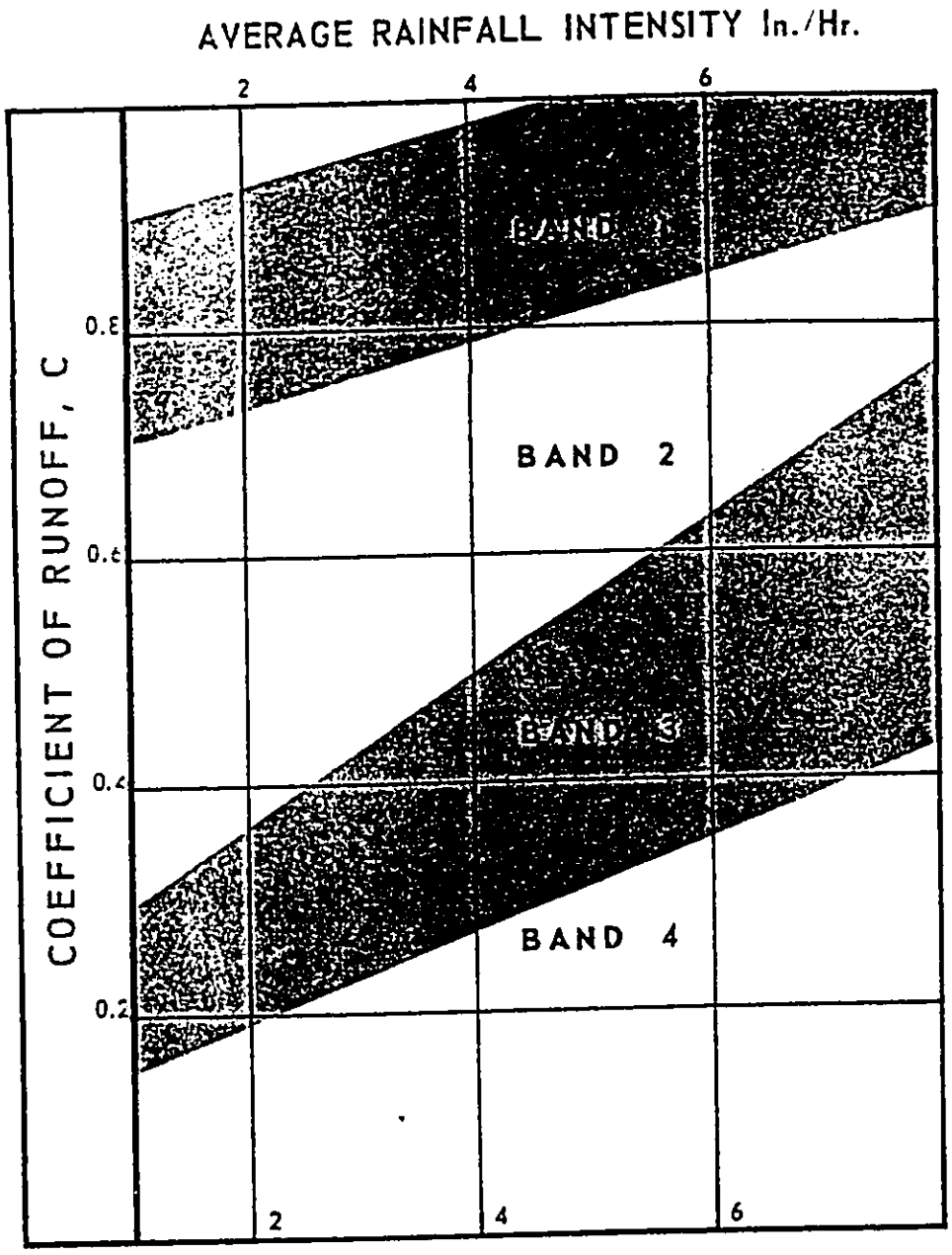
FOR CONVERTING 1 HR. RAINFALL TO RAINFALL INTENSITY OF VARIOUS DURATIONS

TO BE USED FOR AREA LESS THAN 100 ACRES
(See Plate 6 on page 20 for area more than 100 acres)

0000 0026 2858

Table 1

RUNOFF COEFFICIENT FOR AGRICULTURAL AND OPEN AREAS



BAND 1	Steep, barren, impervious surfaces
BAND 2	Rolling barren in upper band values, flat barren in lower part of band, steep forested and steep grass meadows
BAND 3	Timber lands of moderate to steep slopes, mountainous, farming
BAND 4	Flat pervious surface, flat farmlands, wooded areas and meadows

Table 2

MINIMUM RUNOFF COEFFICIENTS FOR BUILT-UP AREAS

RESIDENTIAL AREAS:	C = 0.55 to 0.70
HOTEL-APARTMENT AREAS:	C = 0.70 to 0.90
BUSINESS AREAS:	C = 0.80 to 0.90
INDUSTRIAL AREAS:	C = 0.80 to 0.90

The type of soil, the type of open space and ground cover and the slope of the ground shall be considered in arriving at reasonable and acceptable runoff coefficients.

Table 3

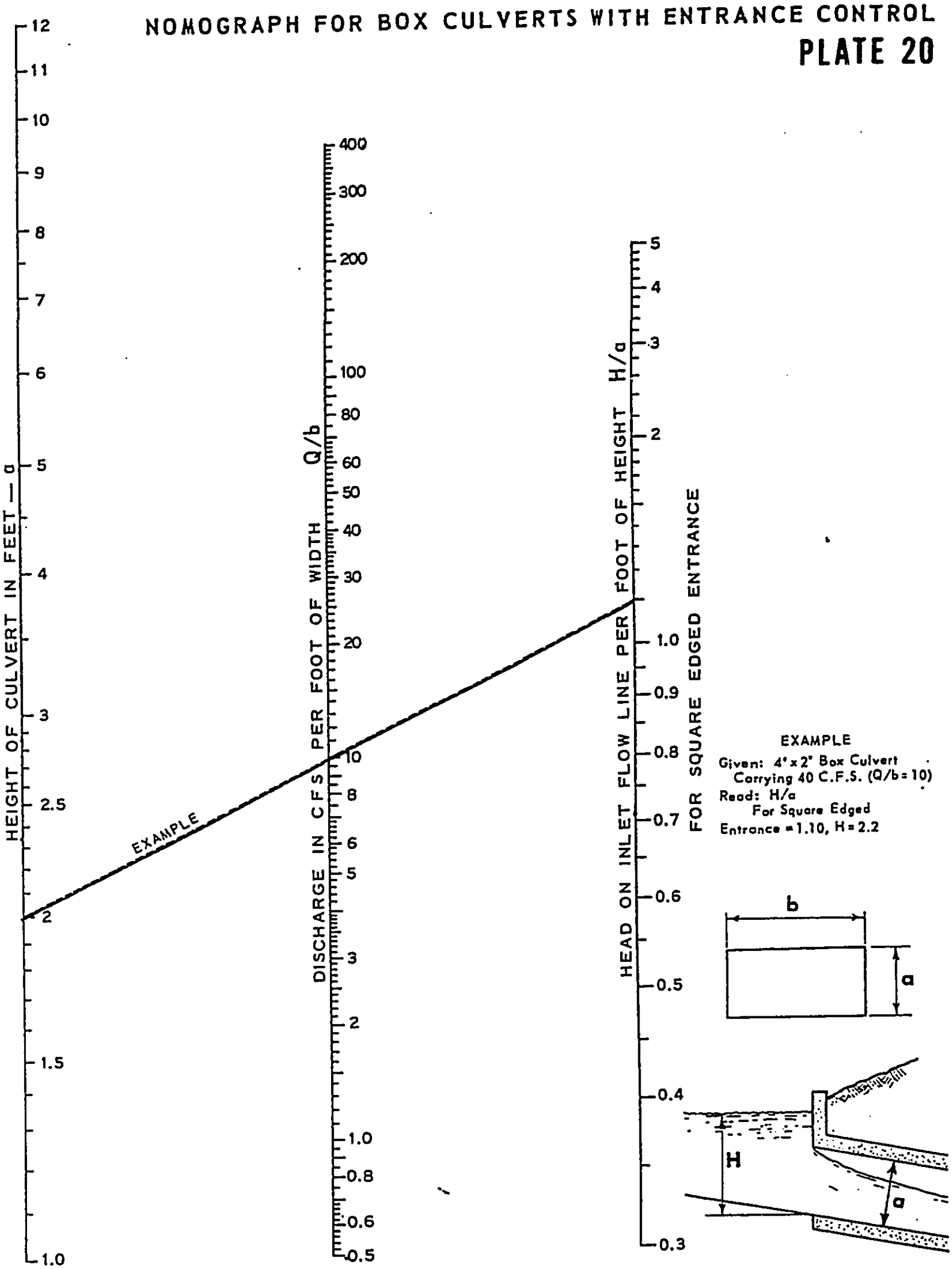
APPROXIMATE AVERAGE VELOCITIES OF RUNOFF FOR CALCULATING TIME OF CONCENTRATION

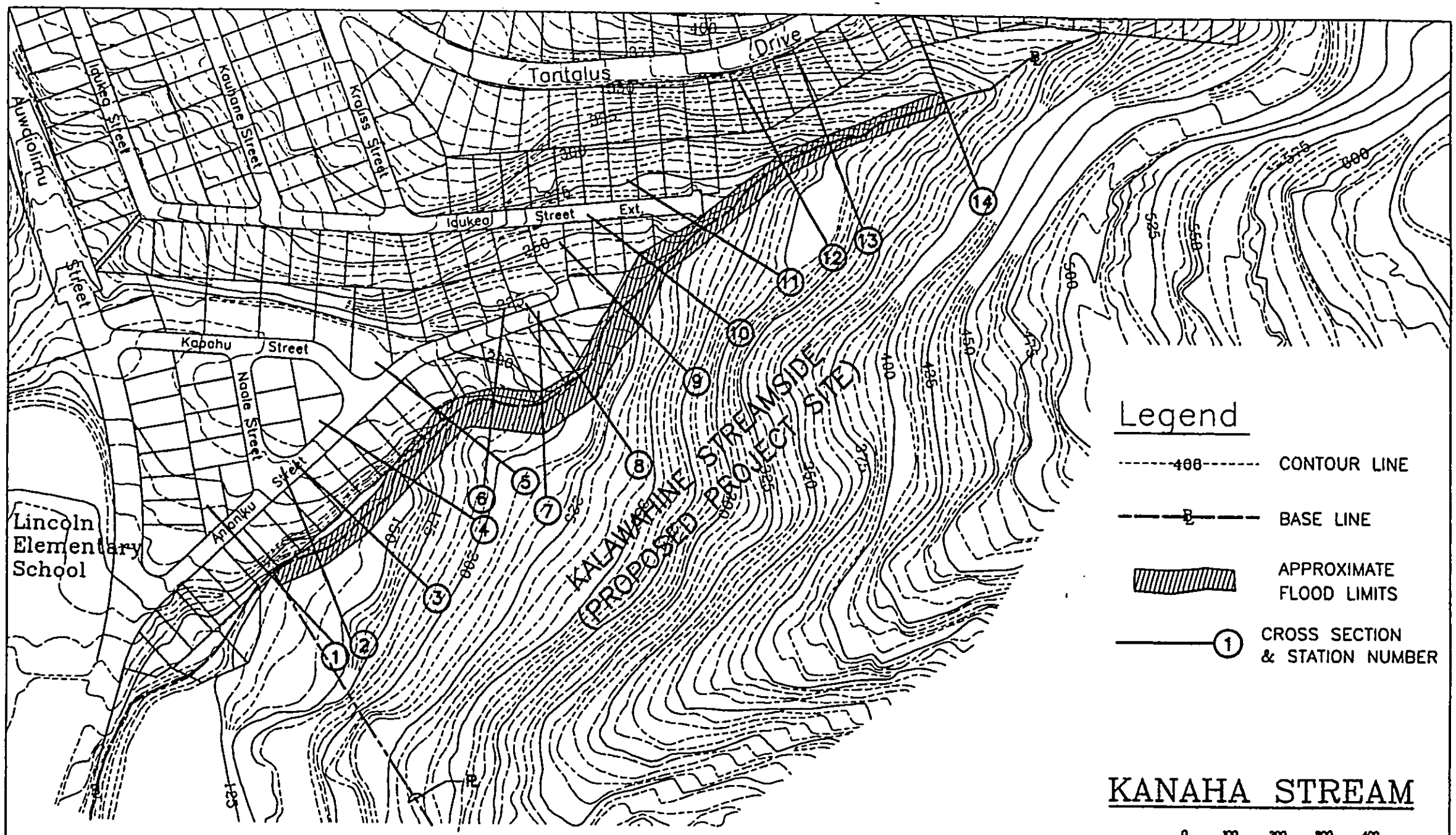
TYPE OF FLOW	VELOCITY IN FPS FOR SLOPES (in percent) INDICATED			
	0–3%	4–7%	8–11%	12–15%
OVERLAND FLOW:				
Woodlands	1.0	2.0	3.0	3.5
Pastures	1.5	3.0	4.0	4.5
Cultivated	2.0	4.0	5.0	6.0
Pavements	5.0	12.0	15.0	18.0
OPEN CHANNEL FLOW:				
Improved Channels	Determine Velocity by Manning Formula			
Natural Channel* (not well defined)	1.0	3.0	5.0	8.0

**These values vary with the channel size and other conditions so that the ones given are the averages of a wide range. Wherever possible, more accurate determinations should be made for particular conditions by Manning Formula or from Plate 5.*

NOMOGRAPH FOR BOX CULVERTS WITH ENTRANCE CONTROL

PLATE 20




Tantalus
Drive
Auwaiolimu Street
Idukea Street
Kauhane Street
Krauss Street
Idukea Street Ext.
Kapahu Street
Naale Street
Anianiku Street
Lincoln Elementary School
KALAWAHINE STREAMSIDE
(PROPOSED PROJECT SITE)
Legend
400 CONTOUR LINE
℄ BASE LINE
APPROXIMATE FLOOD LIMITS
1 CROSS SECTION & STATION NUMBER
KANAHA STREAM
0 100 200 300 400
SCALE IN FEET
SCALE: 1" = 200
EXHIBIT B

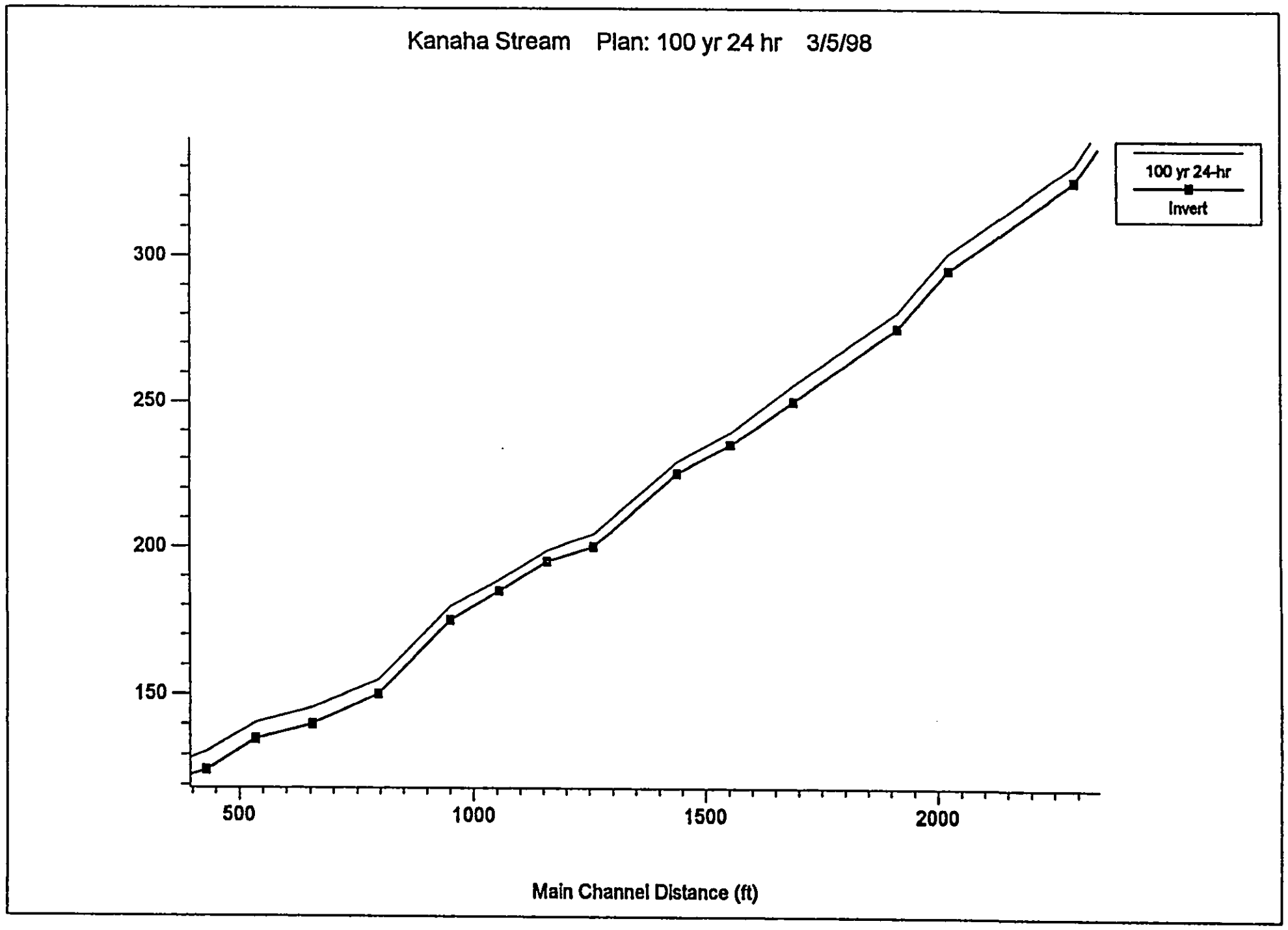
KANAHA STREAM HYDRAULIC ANALYSIS

HEC-RAS Plan: 100 yr 24 hr Reach: Kanaha 3/5/98

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Max Chl Dpth (ft)
1	1350	125	130.97	0.02194	10.06	134.14	43.03	1.00	5.97
2	1350	135	140.51	0.02041	9.48	143.91	56.02	0.98	5.51
3	1350	140	145.61	0.01926	9.60	143.21	55.95	0.96	5.61
4	1350	150	154.90	0.02252	8.91	151.52	61.79	1.00	4.90
5	1350	175	179.62	0.02281	8.66	155.84	67.44	1.00	4.62
6	1350	185	188.86	0.02390	7.89	171.15	88.73	1.00	3.86
7	1350	195	198.78	0.02432	7.86	171.84	90.82	1.01	3.78
8	1350	200	204.52	0.02310	8.57	157.51	69.65	1.00	4.52
9	1350	225	228.99	0.02416	8.10	166.67	83.67	1.01	3.99
10	1350	235	239.44	0.02345	8.55	157.88	71.06	1.01	4.44
11	1350	250	255.70	0.02178	9.68	139.46	48.45	1.01	5.70
12	1350	275	280.67	0.02159	9.81	137.55	46.36	1.00	5.67
13	1350	295	300.96	0.01912	10.21	134.75	45.08	0.97	5.96
14	1350	325	330.83	0.01953	10.09	135.37	44.99	0.97	5.83

EXHIBIT C

KANAHA STREAM PROFILE



NOTE: DUE TO THE LIMITATIONS OF THIS STUDY, A DETAILED TOPOGRAPHIC SURVEY WOULD BE REQUIRED TO PROVIDE A BETTER STREAM ANALYSIS.

EXHIBIT D

Kanaha Stream Plan: 100 YR - 24 HR 3/5/98
Station 1

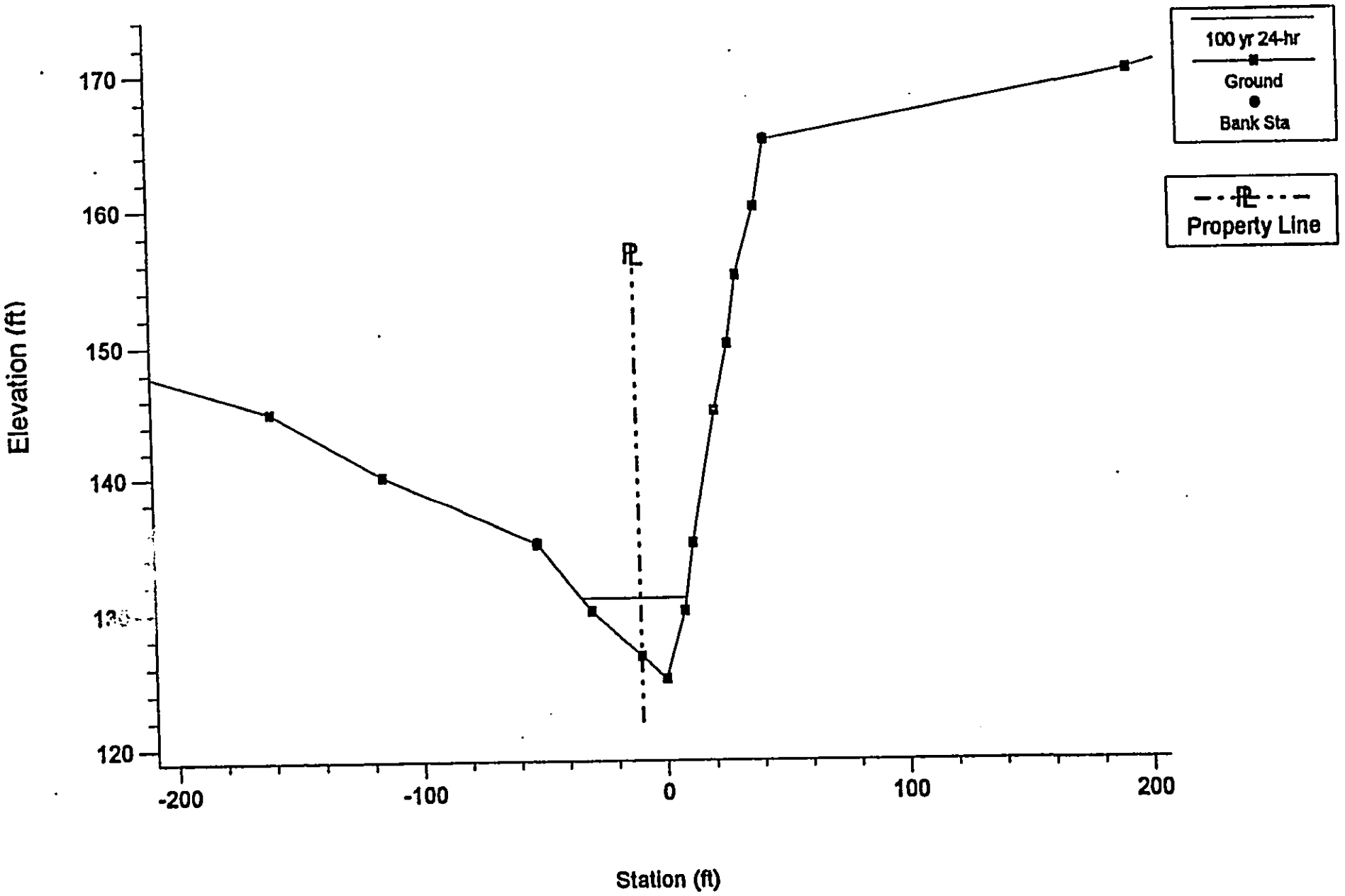


EXHIBIT E-1

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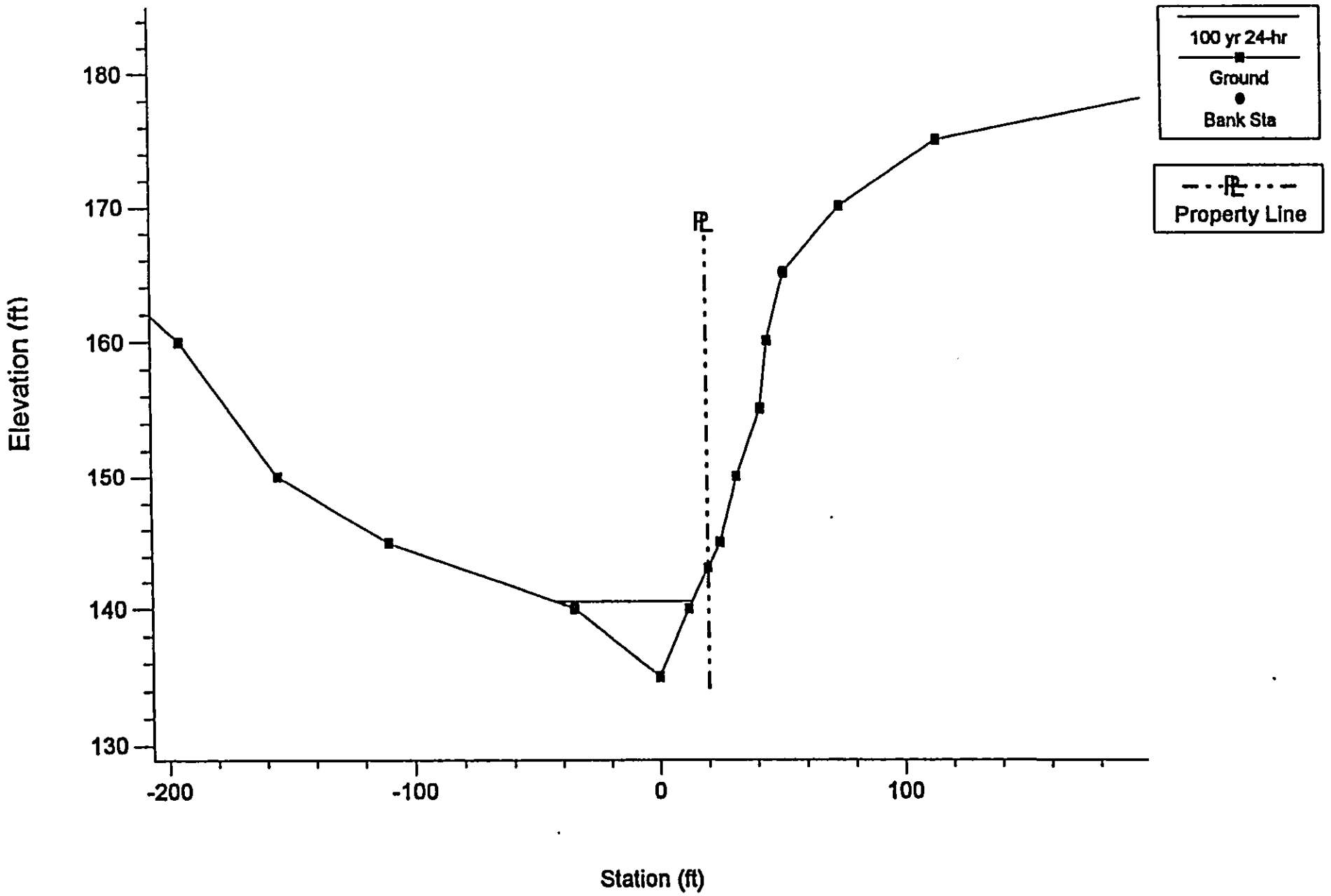

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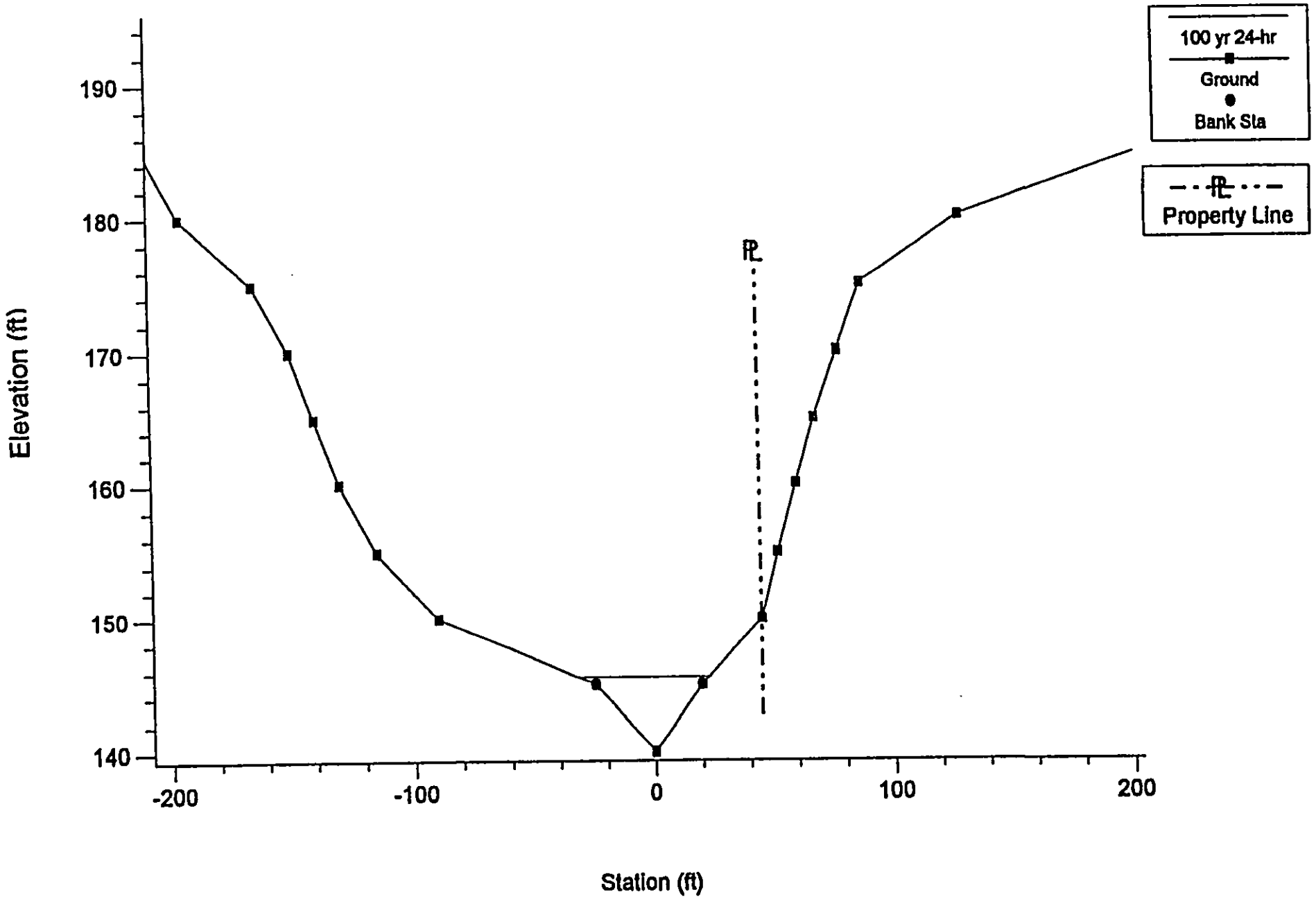

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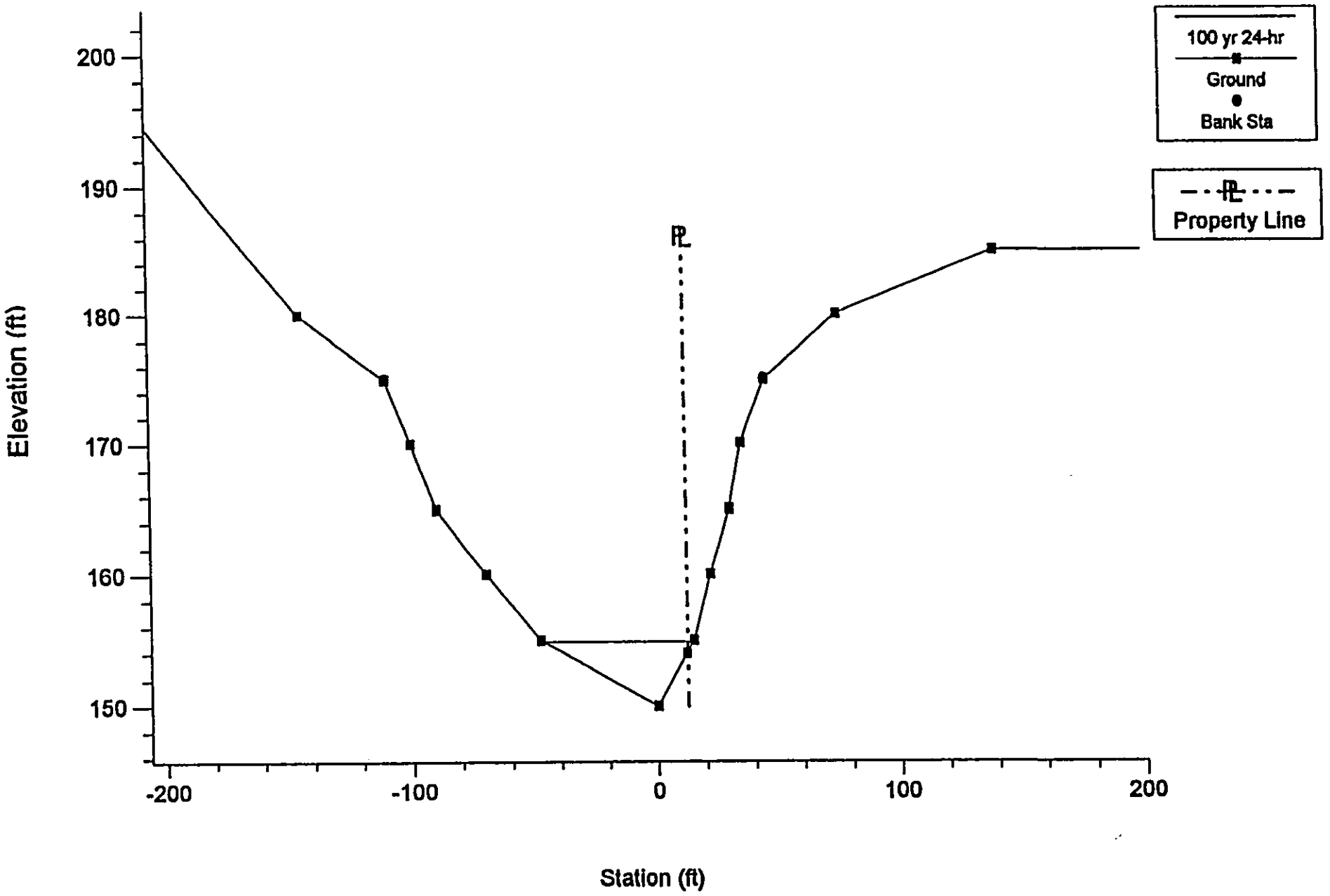

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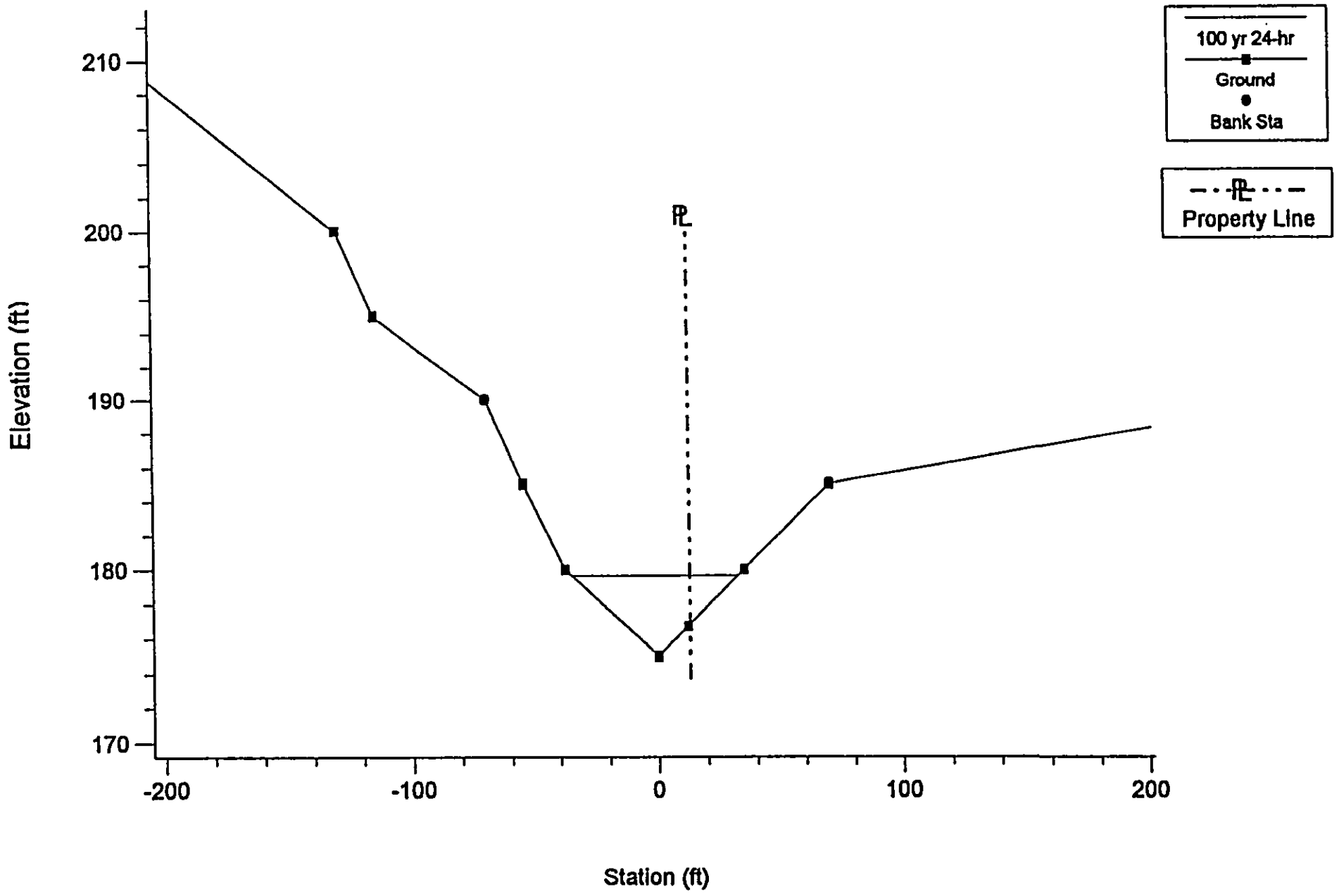

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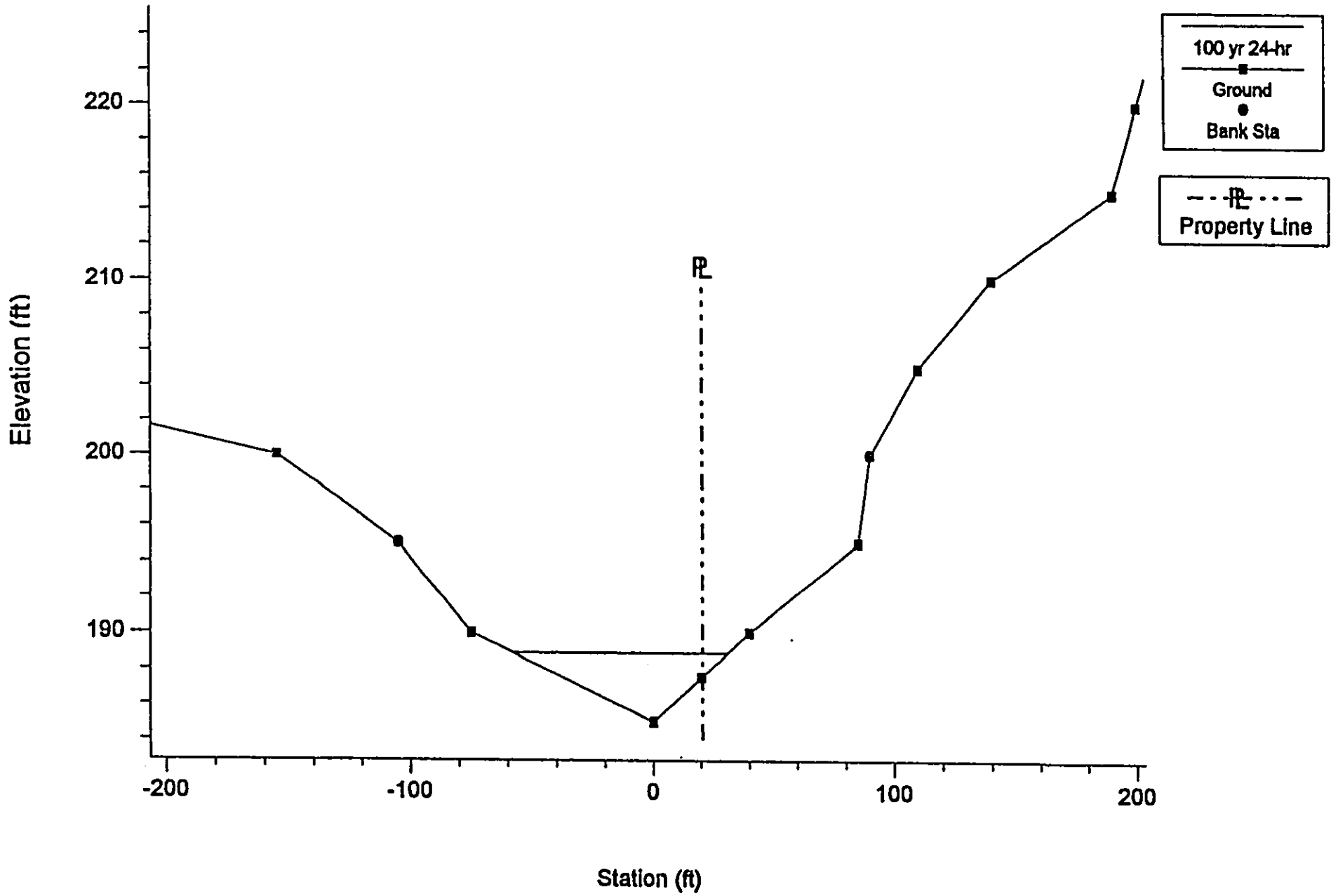

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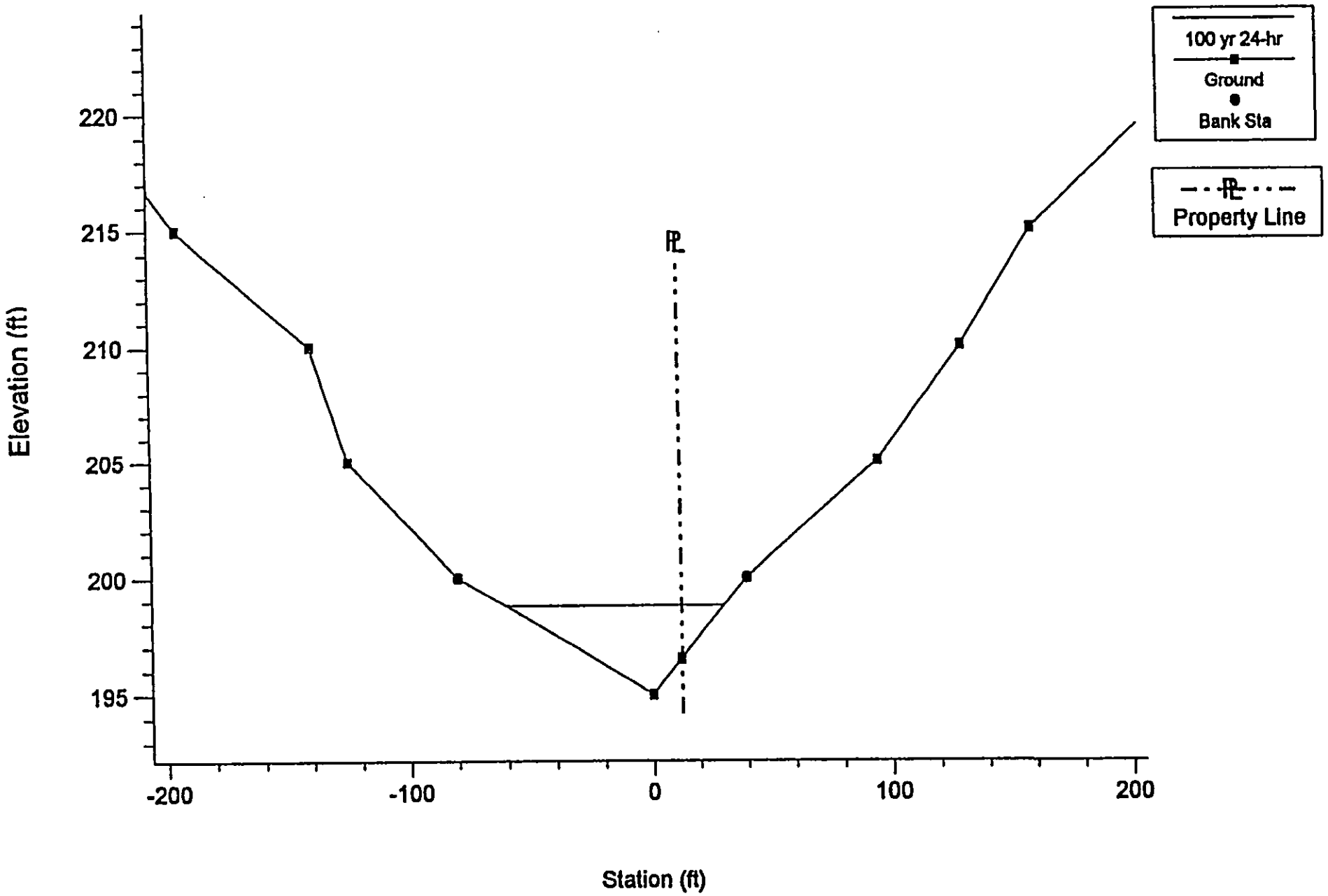

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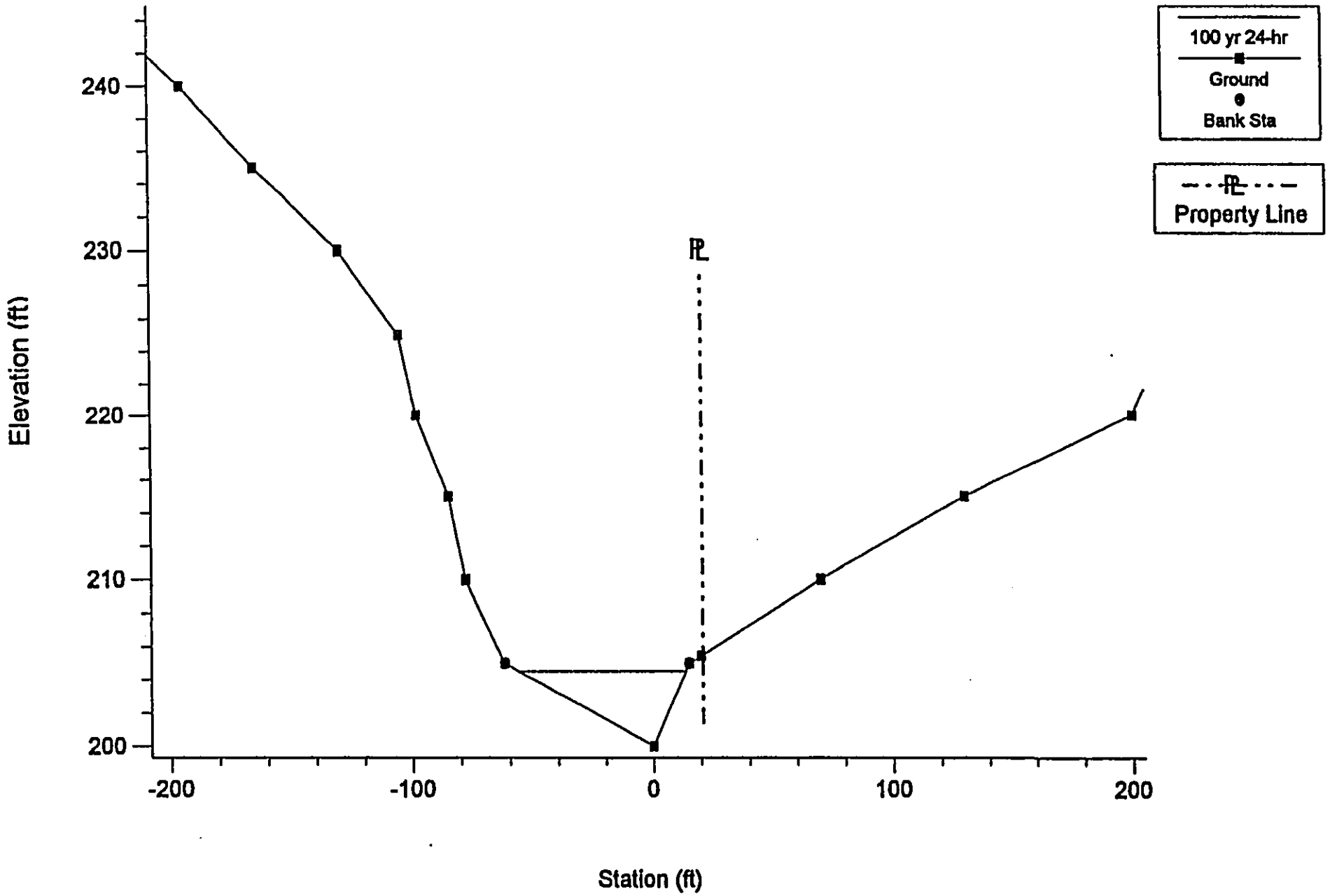

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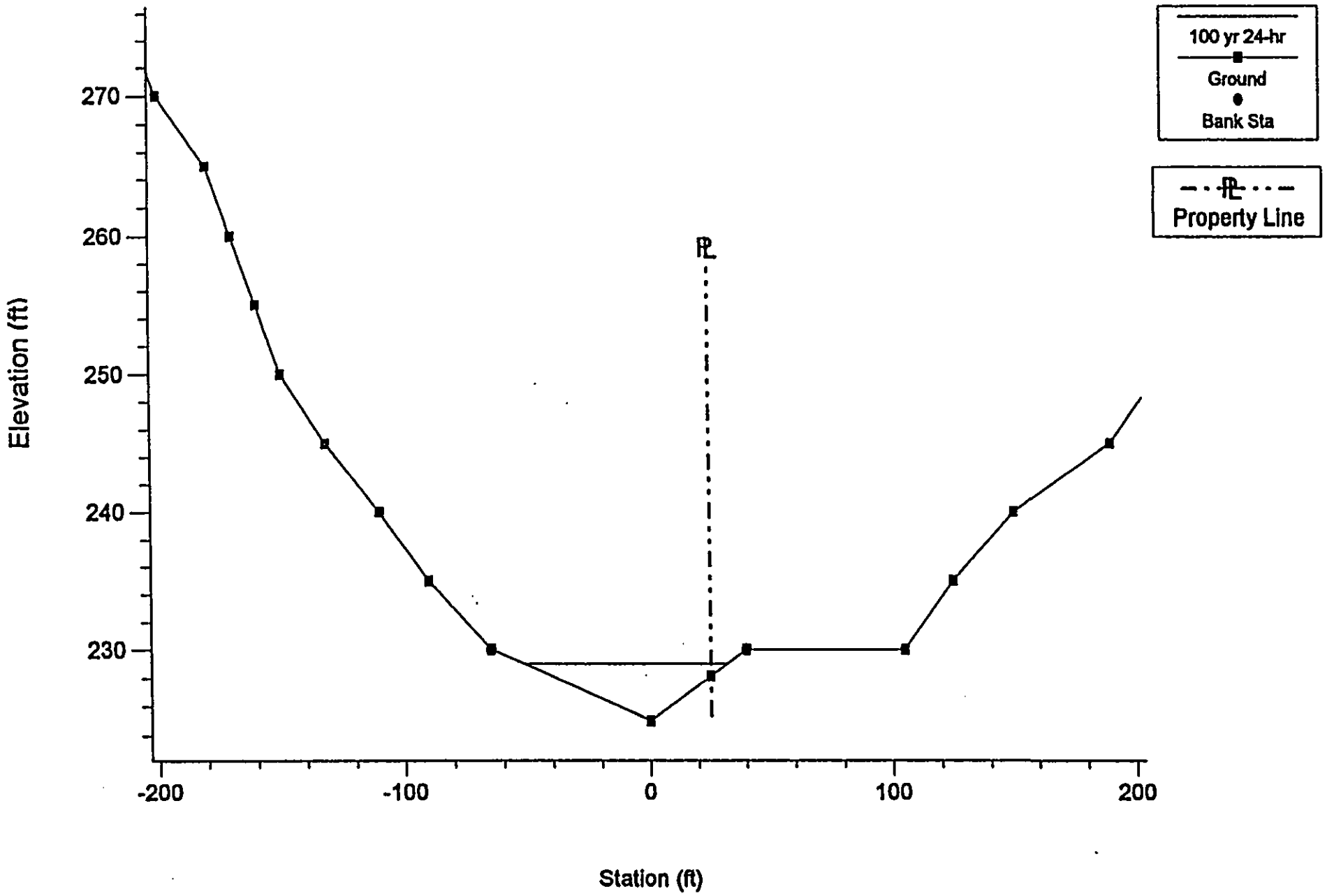

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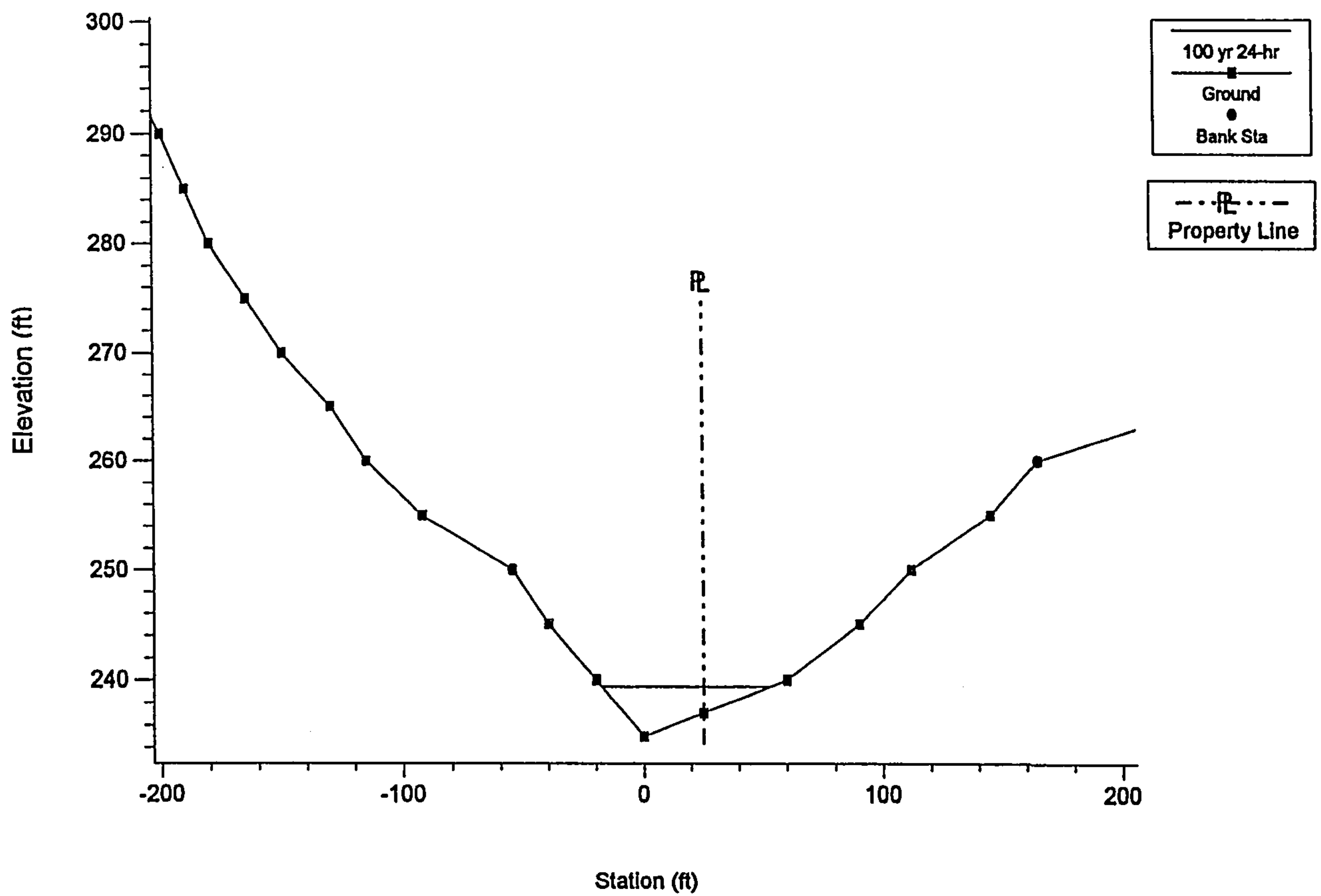

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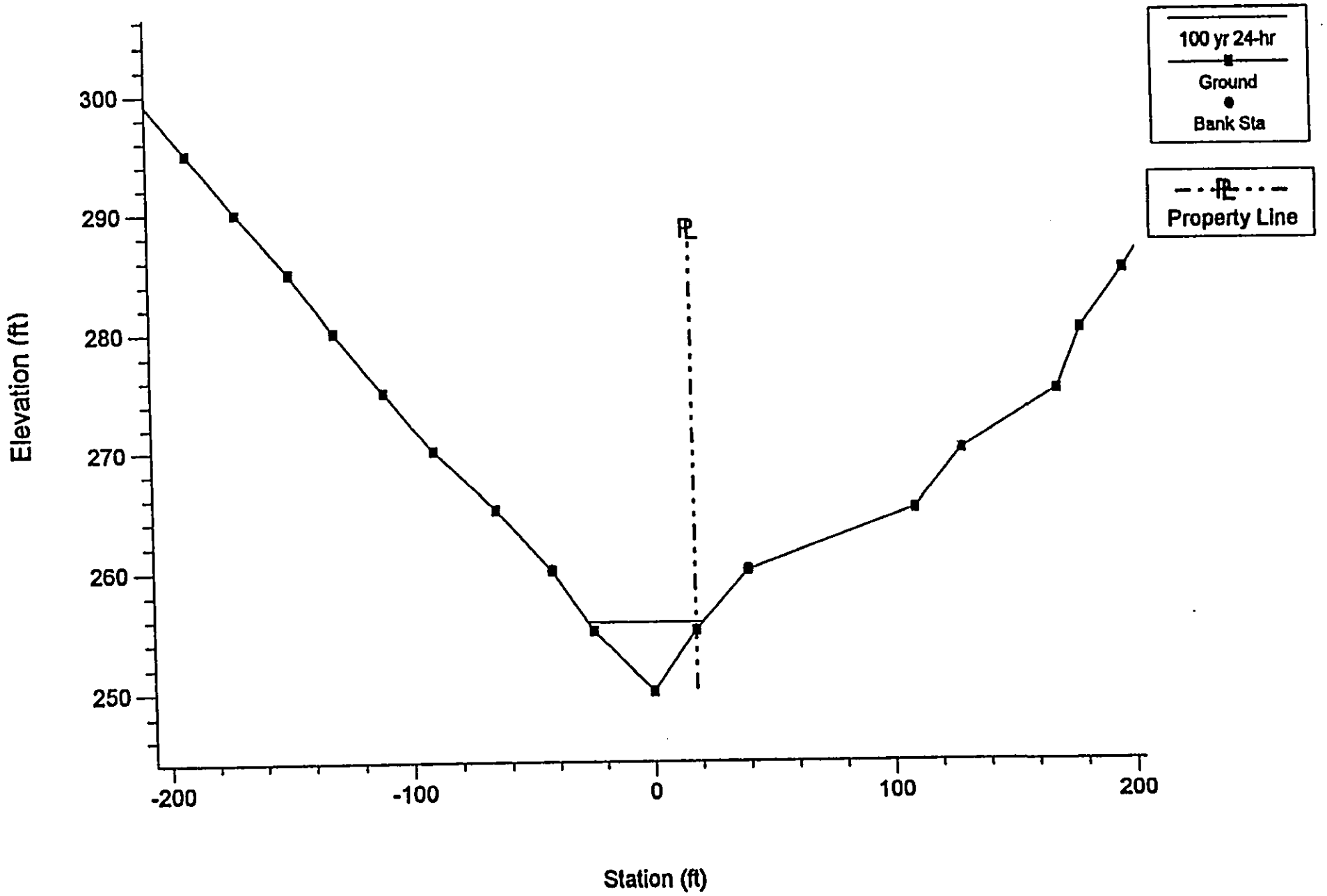

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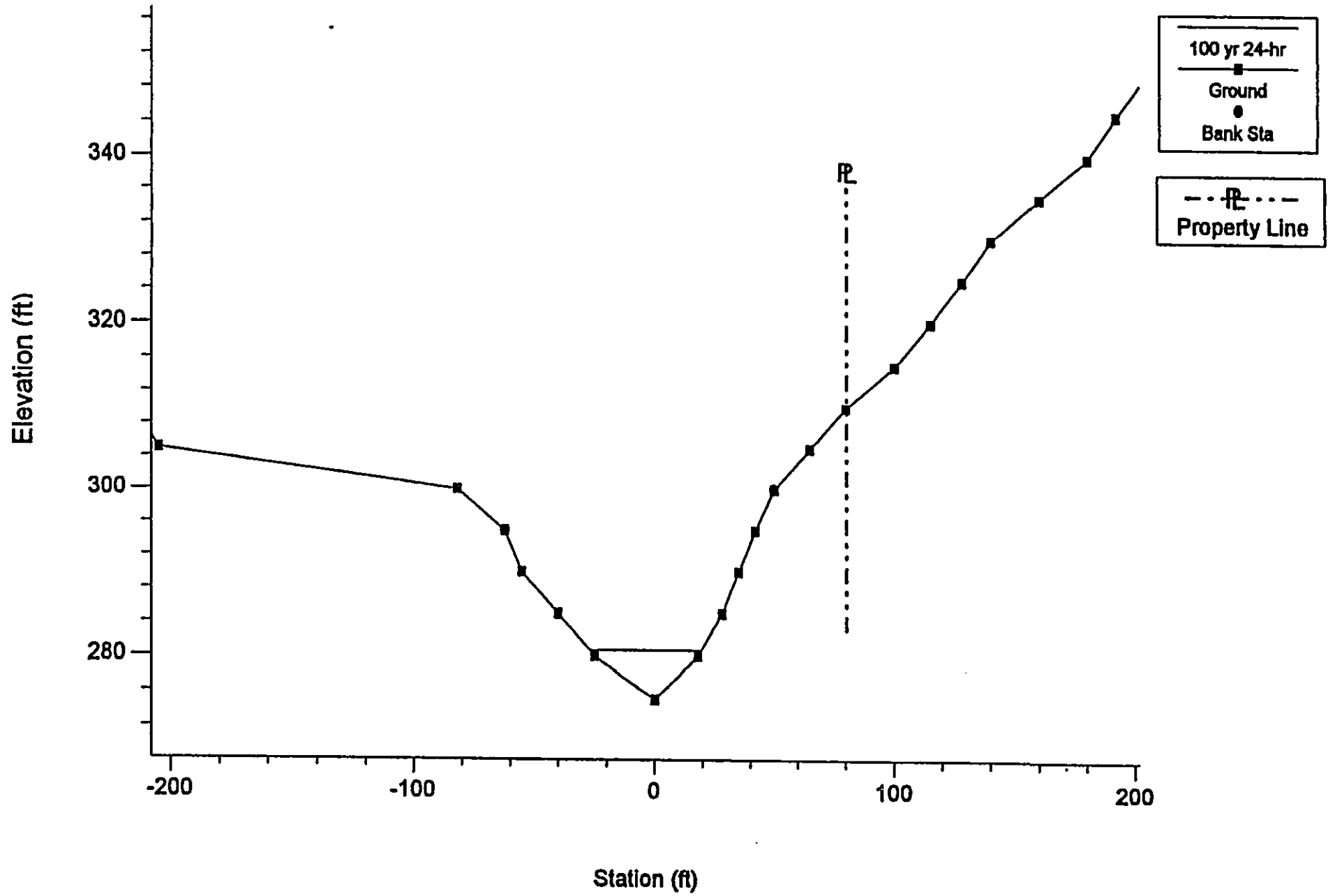

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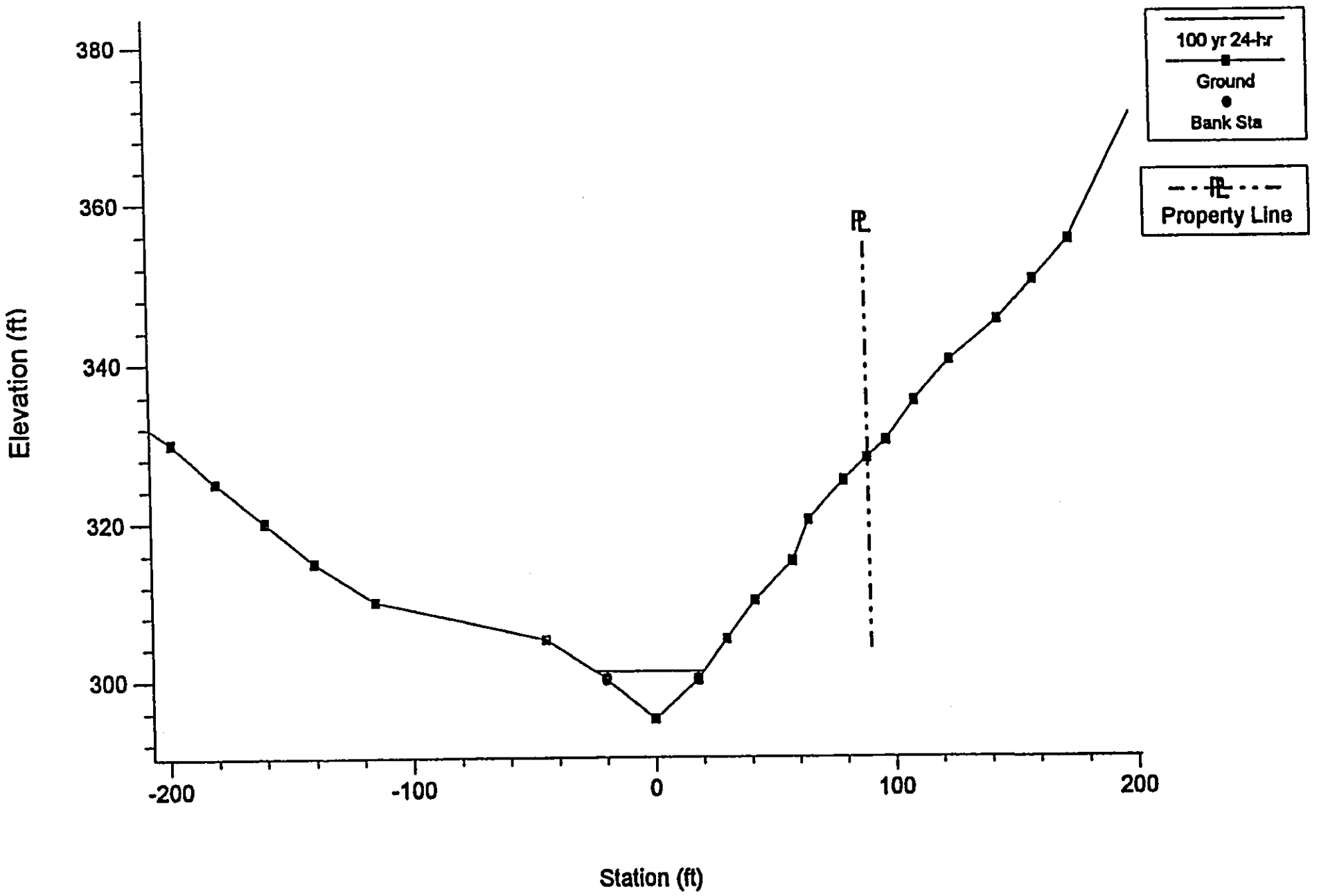

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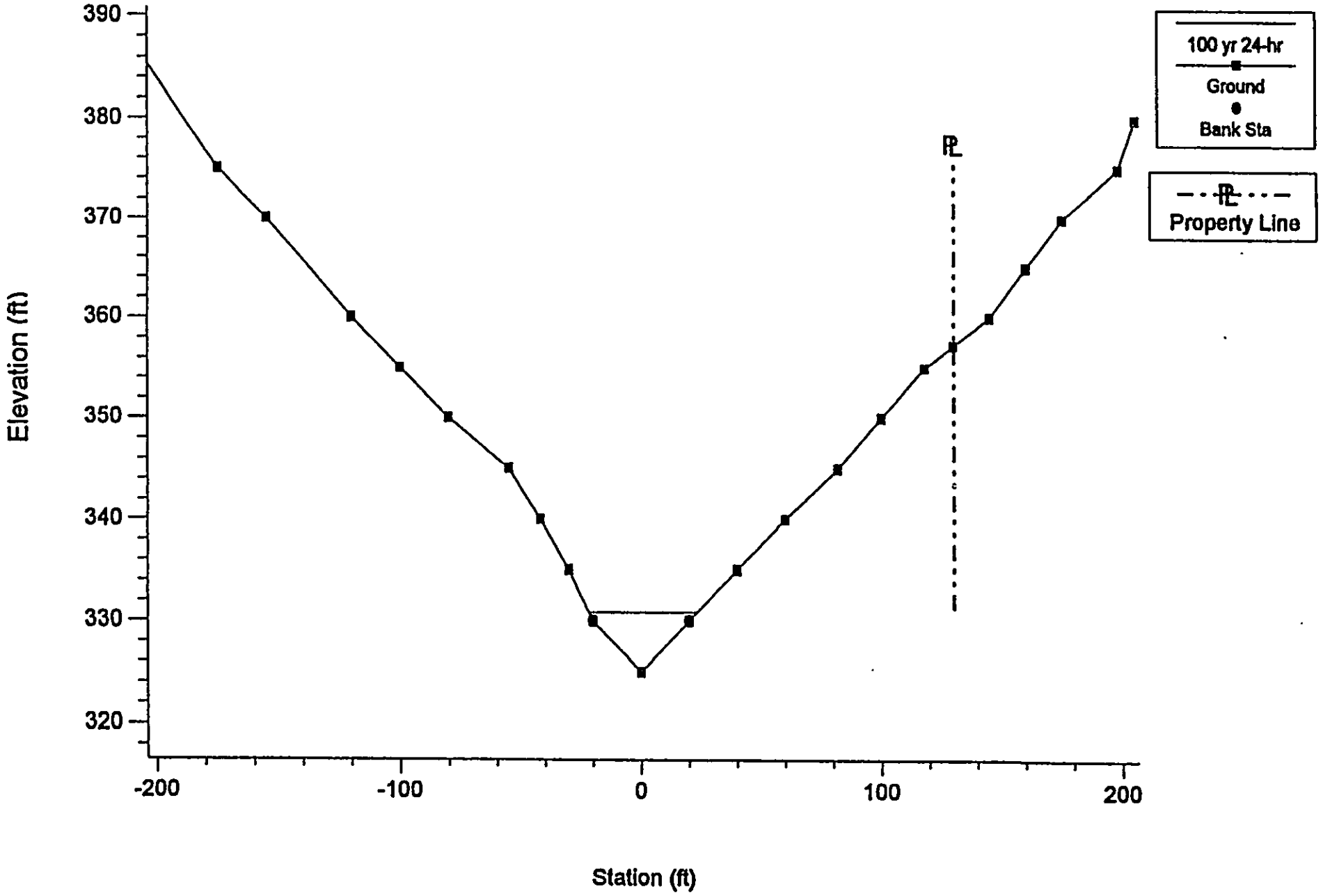

EXHIBIT E-14

B. Botanical Assessment

KALAWAHINE STREAMSIDE
BOTANICAL ASSESSMENT

PREPARED FOR: PBR HAWAII
BY: KENNETH M. NAGATA
DATE: 03 FEBRUARY 1998

0.000 0026 2880

INTRODUCTION

The project site occupies approximately 26 acres in a small gulch along Kanaha Stream behind Roosevelt High School in Papakolea, Honolulu District, Oahu. Residences occupy most of the upper slopes of the site. Tantalus Drive marks the *mauka* boundary but the *makai* boundary in not as well defined. Elevation ranges from approximately 475 ft. to 130 ft.

The vegetation in the region has been described as one of mixed open forest and shrubs (Ripperton and Hosaka 1942). The natural flora in this region consists of open stands of guava (*Psidium guajava*) and koa-haole (*Leucaena leucocephala*) and grasses. Lantana (*Lantana camara*) is widely distributed and smaller shrubs such as false vervain (*Stachytarpheta dichotoma*) and Spanish clover (*Desmodium sandwicense*) are locally abundant. Bermuda grass (*Cynodon dactylon*) is the most abundant grass but pilipiliula (*Chrysopogon aciculatus*), yellow foxtail (*Setaria gracilis*) and Natal redtop (*Rhynchelytrum repens*) are also common in some areas. Trees such as koa (*Acacia koa*) and ohi'a lehua (*Metrosideros polymorpha*) become more abundant in the upper portions of the zone and guava and lantana become less prominant.

RESULTS

A walk-through survey with at least 60% coverage was conducted on 28 January 1998 to determine the floristic composition of the project site. Plants that could not be readily identified in the field were brought back to the lab for closer examination. Taxonomy follows that of Wagner et al (1990) or St. John (1973).

The vegetation in the site was found to differ considerably from that described by Ripperton and Hosaka (1942). It is a mosaic consisting of small elements of closed-canopied forests, grasslands and thickets.

A closed-canopied mixed forest 30-50 ft. high consisting mostly of monkeypod (*Samanea saman*), Chinese banyan (*Ficus microcarpa*), silver oak (*Grevillea robusta*) and mango (*Mangifera indica*) is present along much of the gulch floor. Kukui (*Aleurites moluccana*) also occurs along the stream but only in the *mauka* portion near Tantalus Drive. The understory consists largely of Arabian coffee (*Coffea arabica*), Surinam cherry (*Eugenia uniflora*), white shrimp plant (*Justicia betonica*), rouge plant (*Rivina humilis*) and palm grass (*Setaria palmifolia*). In the *makai* portion 'opiuma (*Pithecellobium dulce*), be-still (*Cascabela thevetia*) and koa-haole also occur in the mixed forest and white shrimp plant becomes dominant in the herb layer.

Small closed-canopied stands of silver oak, mango and Java plum (*Syzygium cumini*) 30-50 ft. tall also occur in the small gully on the west facing slope. The understory in this area is dominated by white shrimp plant with moderate numbers of air plant (*Kalanchoe pinnata*) and rouge plant.

The vegetation along the slopes vary greatly. In the *mauka* portion of the site the slopes and portions of the gulch floor are dominated by dense stands of Guinea grass (*Panicum maximum*) and palm grass 5-8 ft. tall with small numbers of emergent silk oak, be-still, monkeypod and dead trees enshrouded by Madeira vine (*Anredera cordifolia*) and maile-pilau (*Paederia foetida*). A very large grove of bamboo (*Phyllostachys* sp.) and stands of Surinam cherry dominate the west facing slope in the middle portion of the gulch. The slopes in the *makai* section are characterized by dense thickets of be-still, Surinam cherry and koa-haole 10-18 ft. high with emergent mango, 'opiuma, silver oak and Java plum. 'Opiuma becomes very common in this portion of the site. When present the herb layer consists mostly of Guinea grass, palm grass, white shrimp plant or Para grass (*Brachiaria mutica*). In certain areas white shrimp plant dominates the understory. Air plant and rouge plant are occasional and cat's-claw climber (*Macfadyena unguis-cati*) is abundant in certain areas.

Several landscape species occur in the project site. Most common is bowstring hemp (*Sansevieria trifasciata*) which is found in large clumps in several areas on the slopes. Pothos (*Epipremnum pinnatum*) and monstera (*Monstera deliciosa*) are found in small numbers and heliconia (*Heliconia* sp.), false lehua (*Calllandra inaequilatera*), night-blooming cereus (*Hylocereus undatus*) and bougainvillea (*Bougainvillea* sp.) occur in very small numbers.

NATIVE SPECIES

No native plants were observed in the project site.

SUMMARY

The vegetation in the project site is a mosaic of forests, grasslands and thickets consisting entirely of alien (non-native) species. The proposed project will have absolutely no impact on the integrity of the native flora.

LITERATURE CITED

Ripperton, J. C. & E. Y. Hosaka. 1942. Vegetation Zones of Hawaii. Hawaii Agric. Exp. Sta. *Bull.* 89. Honolulu. 60 pp.

St. John, H. 1973. List and Summary of the Flowering Plants in the Hawaiian Islands. Pacific Trop. Bot. Garden Memoir No. 1. Lawai. 519 pp.

Wagner, W. L., D. R. Herbst & S. H. Sohmer. 1990. Manual of the Flowering Plants of Hawai'i. 2 vols. Univ. of Hawaii Press & Bishop Museum Press. Honolulu. 1853 pp.

C. Wildlife Survey

Wildlife Survey
Kalawahine Streamside Project
Papakolea, Island of Oahu

Prepared for:
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Pacific Tower, Suite 650
1100 Bishop Street
Honolulu, Hawaii 96813

Prepared by:
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February 4, 1998

1.0 Introduction

A field survey was conducted on January 28, 1998 to assess the wildlife resources found on a parcel of land proposed for a housing subdivision by the Department of Hawaiian Homelands. The objectives of the survey were to provide a record of wildlife on the parcel of land and determine whether the project would adversely impact any native species.

2.0 Site and Habitat Description

The project site is approximately 26.5 acres, in a gulch running along Kanaha Stream in Papakolea, Oahu. It is sloped with rocky outcrops, running from an elevation of 130 ft. to 495 ft. Kanaha Stream is intermittent. No water was present on the site. It is a highly disturbed site, probably once used for grazing livestock, that has reverted to a wild state. Human debris - old bottles, pots, plywood and barbed wire fence were found on the site. Domestic dogs, chickens, goats, and caged exotic birds were heard or reported from adjacent residential areas.

The habitat is characterized by a rich structural mosaic of closed canopied forest, open forest, dense shrubs and open herbaceous ground cover. No native vegetation that would support native honeycreepers was identified. The dominant trees in the upper part of the site are the monkey pod (*Samanea saman*), Chinese banyan (*Ficus microcarpa*) and Java plum (*Syzygium cumini*). Many trees were covered by Madeira vine (*Anredera cordifolia*). Kiawe (*Prosopis pallida*) is a component of a closed canopied forest on the lower part of the parcel along Kanaha Stream. Dense stands of haole koa (*Leucaena leucocephala*) and Surinam cherry (*Eugenia uniflora*) were present. Guinea grass (*Panicum maximum*), other grasses and herbaceous plants occur throughout the gulch in open stands and as understory components.

3.0 Method

A bird census was made on January 28, 1998 to assess the avifauna on the parcel. Twenty minute counts were made in four locations on the parcel. Locations were selected along the bulldozed road and surveyors trail that sampled an adequate representation of the birds on the parcel. The census began half an hour before sunrise, 6:40 a.m. and ended at 08:40 a.m. All bird seen and heard were recorded. Cursory observations for other wildlife were made along the route between count locations.

4.0 Results and Discussion

No native birds were encountered during the census. The parcel was inhabited by introduced birds that were supported by the rich mixture of fruit trees and shrubs. The dominant species were the red-vented and red-whiskered bulbuls. Spotted doves, zebra doves, and Japanese white eyes were also very common. The absence of any native trees would virtually preclude the use of the parcel by the more common native birds such as the amakihi (*Hemignatus chloris*) or apapane (*Himatione sanguinea*). Elepaio (*Chasiempis sandwichensis gayi*), are capable of thriving in introduced mixed forests, given the right conditions of a closed canopy and dense understory, but no elepaio were detected on the site.

The parcel has suitable open habitat for pueo (*Asio flammeus*), which are predominantly diurnal or crepuscular (Aye 1994), but none were observed on the parcel during the survey. The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) is often associated with lowland exotic vegetation, and may be active at dawn (Kepler and Scott, 1990), but no bats were observed on the survey.

The following introduced birds were encountered during the survey. They are ranked in order of abundance.

1. Red-vented bulbul (*Pycnonotus cafer*)
2. Red-whiskered bulbul (*Pycnonotus jocosus*)
3. Japanese white-eye (*Zosterops japonicus*)
4. Zebra dove (*Geopelia striata*)
5. Spotted dove (*Streptopelia chinensis*)
6. Northern cardinal (*Cardinalis cardinalis*)
7. Japanese bush warbler (*Cettia diphone*)
8. House finch (*Carpodacus mexicanus*)
9. Red-billed leiothrix (*Leiothrix lutea*)
10. White-rumped shama (*Copsycus malabaricus*)

Although not encountered, the small Indian mongoose (*Herpestes auropunctatus*), feral cat (*Felis cattus*), Norway rat (*Rattus norvegicus*) and roof rat (*Rattus rattus*) are probably on the site. Because of the number of fruit trees and shrubs, it is possible that feral pigs (*Sus scrofa*) from the upper forest may visit the site during periods of abundant fruit.

5.0 Conclusion and Summary

The habitat is an introduced mixed forest with shrubs and herbaceous ground cover, typical of disturbed lowland vegetation along the leeward slopes of Honolulu. No native birds or the bat were found on site. It is unlikely that the proposed development would impact any native species.

6.0 Bibliography

Aye, P.P. 1994. Study of biology, ecology, and mortality or owls in Hawaii. Master Thesis. University of Hawaii, Department of Animal Science.

Hawaii Audubon Society. 1996. Hawaii's Birds. 4th Edition, 2nd Revision, Honolulu, Hawaii

Kepler, C.B. and J.M. Scott. 1990. Notes on distribution and behavior of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), 1964-1983.

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D. Archaeological Inventory Survey in Kalāwahine 'Ili

ARCHAEOLOGICAL INVENTORY SURVEY IN KALAWAHINE 'ILI

HONOLULU AHUPUA'A, KONA DISTRICT, ISLAND OF O'AHU

Michael J. Kolb, Ph.D.
Christi A. Mitchell, B.A.
Patty Jo Conte, B.A.
Michael McFadden, B.A.

Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii

April 1993

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INTRODUCTION

This report presents the results of an archaeological inventory survey conducted for the Phase I increment of Kalawahine[1] Residential Project area, located on the lower slope of Tantalus, in Honolulu, Island of O'ahu (TMK 2-4-34:Por.08). The survey was conducted for the Department of Hawaiian Home Lands by the Hawaii State Historic Preservation Division, under the supervision of Michael J. Kolb, assisted by Edward K. Archer, Patty Jo Conte, Michael McFadden, and Christi A. Mitchell.

ENVIRONMENTAL SETTING

Kalawahine is in the *ahupua'a* of Honolulu in the district of Kona on the island of O'ahu (Figure 1). The project area is a 12 acre parcel behind Roosevelt High School in the *'ili* of Kalawahine (Figs. 2 and 3). It is in the large ravine cut by Kanaha Stream, between the valleys of Pauoa and Makiki. Elevation in the project area ranges from roughly 66 m (200 ft) to 79.2 m (240 ft).

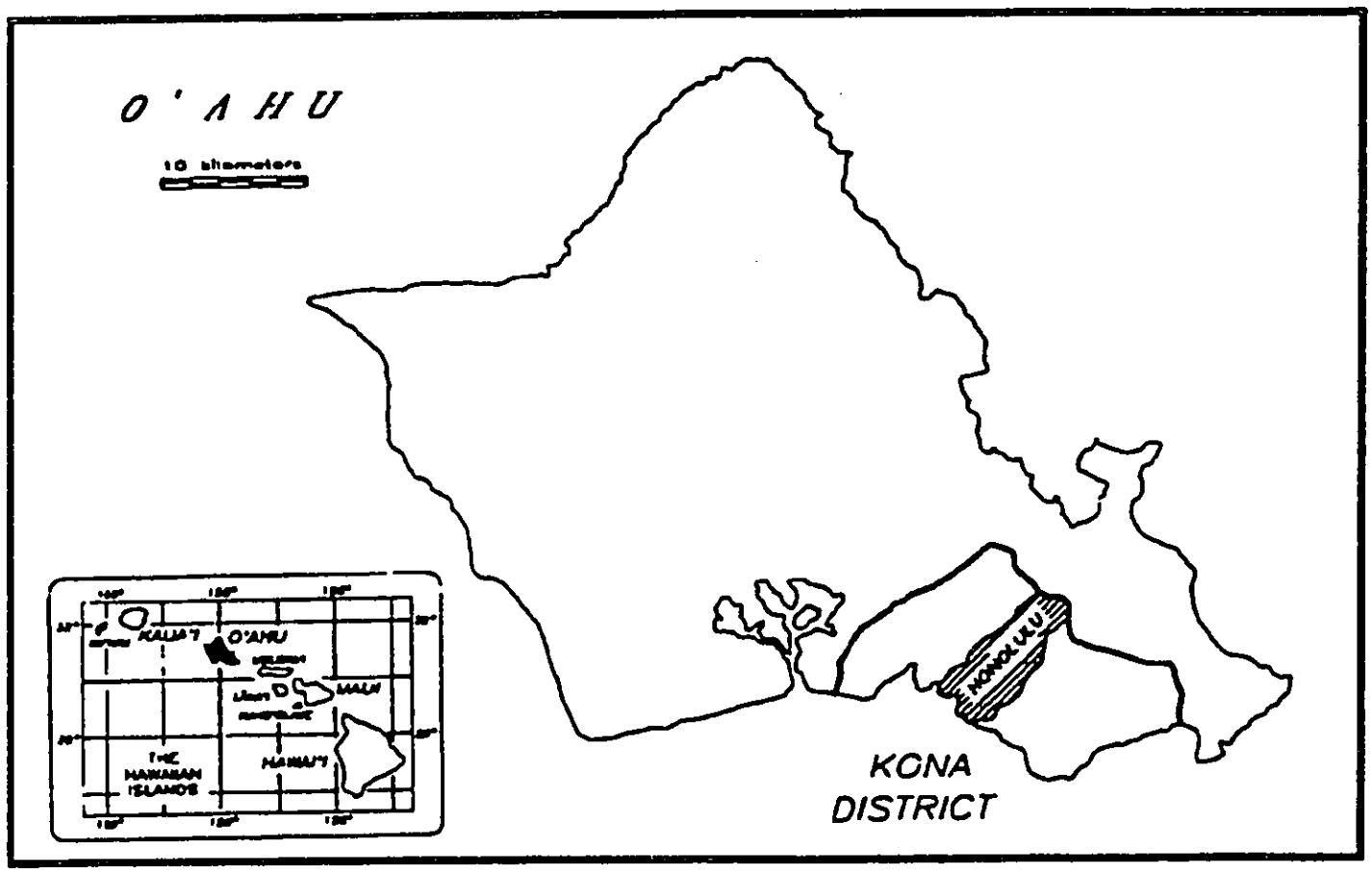

Figure 1. Location of the *ahupua'a* of Honolulu, Kona, O'ahu.

[1] Due to printing difficulties, Hawaiian words are spelled without macrons.

Figure 2. Approximate location of project area in Honolulu.

The lavas and soils found within the project area are of the Ko'olau Volcanic Series which emanated from Ko'olau Volcano, one of the two shield volcanoes from which the island of O'ahu was formed. The Ko'olau range is the eroded remnants of the elongate Ko'olau shield that had grown to its full height by 700,000 to 2 million years B.P. Most of the Ko'olau Series rocks are tholeiitic basalts and olivine basalts, and there are small amounts of oceanite.

After the end of the Ko'olau volcanic activity there was a long period of stream erosion in which large valleys were created and then filled with alluvium as the island submerged. The major valleys of Nu'uanu, Makiki, and Pauoa are all examples of this stream erosion. The project area is in a ravine that lies between the two easternmost valleys in the *ahupua'a*, Makiki Valley and Pauoa Valley.

After a period of volcanic inactivity and erosion which lasted perhaps as long as two million years, the Honolulu Volcanic Series began (Macdonald and Abbot 1970:366). The Honolulu Volcanic Series is the period between 500,000 years B.P. to 10,000 years B.P., in which volcanic activity resumed on O'ahu. It was during this volcanic series that the large volcanic features in the Makiki and Pauoa area were formed. These features include Punchbowl (Puowaina), Tantalus (Pu'u O'hia), Round Top (Pu'u Ualaka'a), and Sugarloaf (Pu'u Kakea).

Punchbowl is a tuff cone less than half a mile (0.8 km) west of the project area. The tuff is mostly brown and consists of palagonitized vitric ash and lapille with scattered fragments of coral limestone and Ko'olau basalt. Tantalus, Round Top, and Sugarloaf are all cinder cones that mark a row of vents along the ridge that forms the northern and eastern boundary of Makiki Valley. Numerous nephelinite dikes in Makiki represent the fissures that fed the Round Top cinder cone. Black ash from these cinder cones was flung over the area and can be found on the flanks of the older Punchbowl cone.

Today, there are no perennial streams in the ravine between Makiki Valley and Pauoa Valley. The USGS Quad maps show one intermittent stream, called Kanaha Stream, in the ravine (USGS Quad Map 1983:14). Although not indicated on the USGS maps, a dry stream gulch called Kahawai O Ko Po'opo'o forms the western boundary of the Kalawahine parcel (see the stream in Figure 3).

Three soil types are found in the project area. A silty clay loam of the Tantalus Soil Series is found on slopes of 8-15%. This silty clay loam has slow runoff and can be found within the Kanaha stream bed (Foote 1972:121). A very stony clay of the Kaena Soil Series is found on slopes of 10-35% and has medium to rapid runoff. This soil type is found entirely up slope of Kanaha stream, both above and below Tantalus Drive. There are many stones on the surface and in the profile of the Kaena very stony clay. What follows is a representative profile of the Kaena series, the most commonly encountered soil type within the project area (Foote 1972:49-50):

02-25 cm	very dark gray, moist and dry stony clay: strong, fine and medium sub-angular blocky structure: extremely hard, very firm, very sticky and very plastic; abundant fine and medium roots; common, fine, distinct dark-yellowish-brown mottles; common black organic stain; abrupt smooth boundary, 20.5 to 30.8 cm thick.
25-94 cm	dark gray, moist and dry, stony clay; weak, coarse, prismatic structure; extremely hard, very firm, very sticky and very plastic; plentiful very fine and fine and few medium roots; many fine, distinct dark reddish-brown mottles; few black stains; gradual wavy boundary, 51.2 to 76.9 cm thick.
94-114 cm	dark grayish brown, moist and dry, stony clay; weak, coarse, prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine roots; common fine, distinct strong brown mottles; few black stains; few fine gypsum crystals; smooth boundary, 17.9 to 23.1 cm thick.
114-137 cm	dark grayish brown, moist and dry, stony clay; common fine, distinct, strong brown mottles; extremely hard; very fine roots; many highly weathered pebbles and basaltic stones.

The third soil type is rough mountainous land. Rough mountainous land is steep land (over 30%) which is broken by numerous intermittent drainage channels. This type is characterized by a thin soil mantle 2-25 cm thick over saprolite and can be found in the southern half of the project area. This soil is generally not stony (Foote 1972:119).

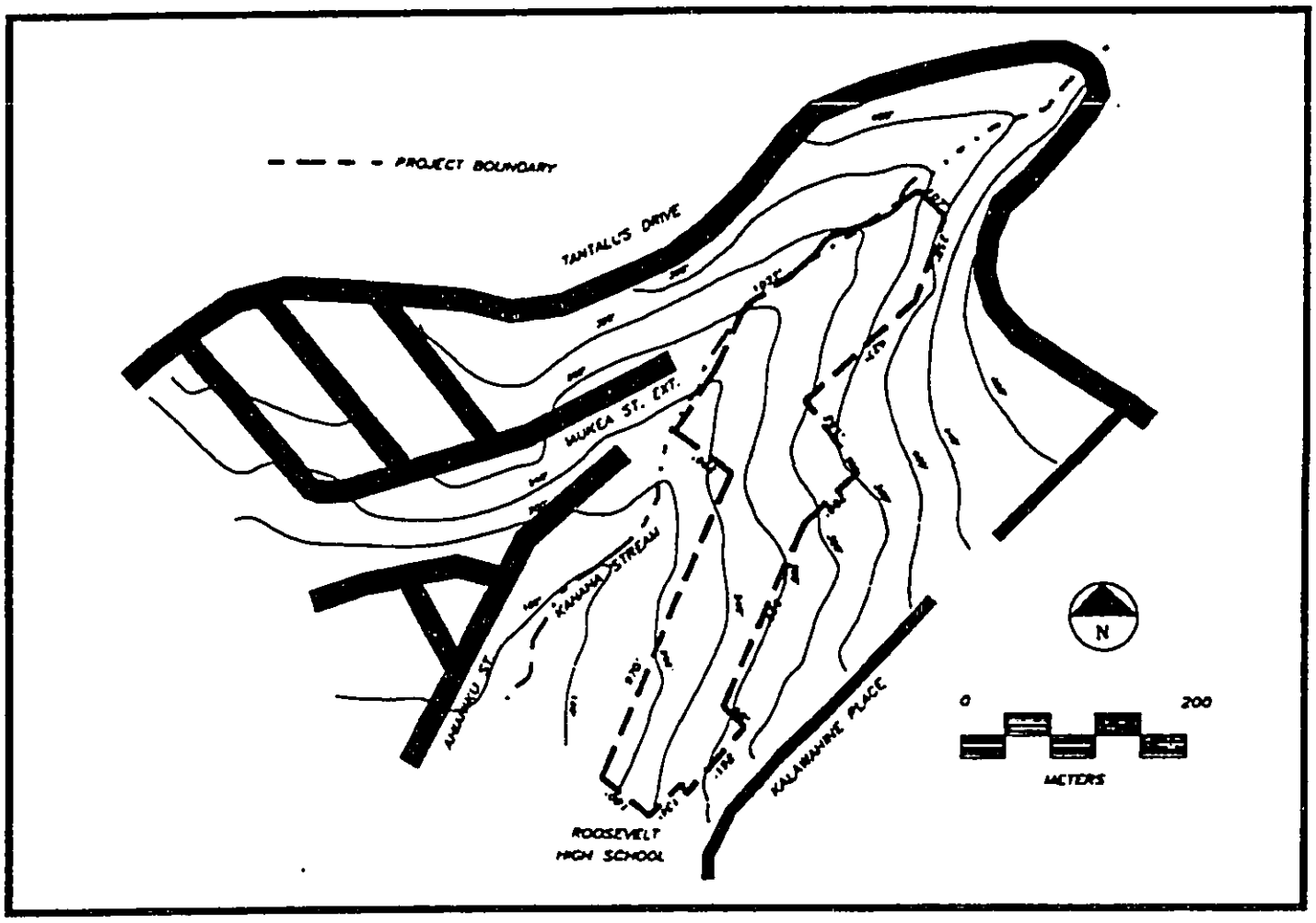

Figure 3. The project area boundary between Tantalus Drive and Kalawahine Place.

The average mean temperature in Honolulu is 23.9° Celsius (74.7° Fahrenheit). Mean temperature decreases roughly 2.2° Celsius (4° Fahrenheit) with each increase in altitude of 328 m. In Hawaii the winds are dominated by the northwest trades which blow 80-90% of the time from April to October and 50% of the time from November to March. In the winter low pressure often displaces the trades resulting in south or southeastern winds called Kona winds. Average rainfall at the U.S Experimental Station (115.5 m and 39.6 m) nearest the project area in West Honolulu district, from A.D. 1903-1907 was 135.4 cm a year (Stearns and Vaksvik 1935:200). The data from this experimental station was used because it was the nearest station to the project area and had roughly the same altitude.

The slopes of Tantalus are covered with open guava forest and shrub zones (Armstrong 1983:70). The characteristic plants of this zone, all of which are non-native, are guava (*Psidium sp.*), *koa haole* (*Leucaena leucophala*), lantana (*Lantana camara*), spanish clover, (*Desmodium uncinatum*) and bermuda grass (*Cynodon dactylon*). Other types of vegetation, also non-native, observed during the pedestrian survey include white shrimp (*Justicia betonica*), *lehua* haole (*Calliandra inaequilatera*), surinam cherry (*E. uniflora*), bamboo (*Bambusa vulgaris*), bougainvillea (*Bougainvillea spectabilis*), napier grass (*Pennisetum purpureum*), banana poka (*Passiform mollissina*), morning glory (*Ipomoea congesta*), and monkeypod (*Samanea saman*), *'opiuma* (*Pithecolobium dulce*),

banyan (*Ficus spp.*) silver oak (*Grevillea robusta*), coffee (*Rubiaceae sp.*), lemon (*Citrus limon*), and tangerine (*Citrus sp.*) trees.

BACKGROUND SETTING

RESEARCH METHODS

The first phase of the Kalawahine project was archival documentary research. This archival research was undertaken between October 1 through October 30, 1991. Information on pre A.D. 1848 Kalawahine consists of early Hawaiian and early ethnographic accounts (e.g. 'I'i 1963; Fornander 1974). Records on the Great *Mahele* consist of Native Register, Native and Foreign Testimonies and Award Books, as well as the *Indices of Awards*. Non-Mahele records include Boundary Commission Notebooks, Bureau of Conveyance records (Libre), and modern historical analyses (e.g. Daws 1966; Fitzpatrick 1989). Documents on turn-of-the-century land use come from modern maps as well as federal and state congressional bills (Public Law). Archival research also included an examination of previous archaeological work.

SETTLEMENT PATTERNS A.D. 1800-1870

The *Ahupua'a* of Honolulu

Archival research indicates that Kalawahine was one of the many *'ili*, a land section, within the *ahupua'a* of Honolulu (e.g. *N.R.* 5:261). The length of Honolulu *ahupua'a* extended from the shores of Iwilei, Honolulu Harbor, Kukuluaeo and Kalia to the Nu'uanu Pali, overlooking the windward side of O'ahu. The width of Honolulu *ahupua'a* ran from Kapalama Stream to the edge of Manoa Valley, and was focused on the large valley of Nu'uanu (and its side valley of Pauoa), and the lesser valley of Makiki. Inland it included the ridges of Pacific Heights, Tantalus and Makiki. Punchbowl also lies within the *ahupua'a*.

The antiquity of Honolulu as an *ahupua'a* land unit is uncertain, although Fornander (1974:474,488,188) refers to Punchbowl in two stories of Kamehameha's warriors (circa A.D. 1795), and the valley of Pauoa in the legend of Kahalaopuna.

Although the traditional ruling centers of O'ahu included 'Ewa, Waikiki and Ko'olaupoko, Honolulu was an important and fertile area on the island. The establishment of Honolulu as the main trading port of O'ahu in the early A.D. 1800's made it the official capital for the entire Hawaiian Kingdom by A.D 1850. However, in the first half of the 19th century A.D., the *ahupua'a* of Honolulu was divided into over forty *'ili*, as listed in the *Indices of Awards*. The organization of the *'ili* appears to be complex and the archival

documentation of the *'ili* boundaries is limited by the lack of pre A.D. 1850 maps of Honolulu. It is known that 'Auwiolimu *'ili* is also an *'ili lele* (jump *'ili*) from Monsarrat's A.D. 1897 map of Honolulu. 'Auwiolimu runs approximately parallel to the *mauka* parcel of Kalawahine (Kewalo separates the two), and then "jumps" below Punchbowl near Nu'uanu Stream. It is unknown how many of the *'ili* were *'ili lele*.

In terms of settlement patterns in the early A.D. 1800's, permanent residence in Honolulu was primarily concentrated in the Harbor area along the beach front from Nu'uanu to Kaka'ako (Daws 1966:68). As time progressed, residences sprawled inland to the base of Punchbowl and less than a mile up Nu'uanu Valley (Daws 1966:226). Businesses and boarding houses began to spring up around the waterfront between A.D. 1820-1830 (Daws 1966:68). A trail led *mauka* from the Harbor toward Nu'uanu, and another which may have become modern day Beretania Street formed the inland boundary of the town (Daws 1966:67). By A.D. 1847, one map gives the size of Honolulu as "five sixths of a mile long and two thirds wide" from Beretania to the coast and Nu'uanu Stream to Iolani Palace (*The Friend* 15 January 1847, as noted in Daws 1966:233), while another from the same year shows the city as including the area along the shore from Nu'uanu Stream to Kaka'ako; King and Beretania Streets were drawn as far east as Ward Avenue, and Nu'uanu Street went north at least as far as Kuakini Avenue (Metcalf 1847). Trails headed west to 'Ewa and north towards Nu'uanu and Pauoa Valleys. As the city of Honolulu grew throughout the A.D. 1830's and A.D. 1840's, it fell under the administration of the Governor of O'ahu, and later of the Kingdom-wide legislature. As the importance of Honolulu as a traditional political and social unit diminished, titles and surveyed boundaries usurped the former boundaries of many *'ili*, forcing individual land owners to decide how to manage their lands (Daws 1966:225).

With exception of those given to Keli'iahonui in Kalwahine, no Land Commission Awards were allotted above Punchbowl or in coastal Iwilei. The only indication of land use for the *mauka* lands comes not from an L.C.A. testimony, but from the recollections of a witness at a Boundary Commission hearing. According to an A.D. 1873 Boundary Commission testimony at least part of the *mauka* portion of Kalawahine had been at one time partially planted in potato, at the old settlement of Naihi Kukui (Boundary Commission Book 1:223-24). Little is known of Naihi Kukui other than he sailed to London with Liholiho in A.D. 1823, and that his daughter, Kalama, married King Kamehameha III in A.D. 1837 (Kamakau 1961:256,341). Naihi Kukui apparently died prior to the Great Mahele, (he is not listed in the *Indices of Awards)* and his settlement, on the boundary of Kalawahine and Makiki was incorporated into Keli'iahonui's award. Upon the death of Keli'iahonui, his lands were inherited by his second wife Kekauonohi, who in turn bequeathed them to Levi Ha'alelea.

By examining L.C.A. awards for other areas of Honolulu as well as the surrounding valleys, it is possible to determine a general pattern of land use as described in the *Native Register* at mid-century. In the *mauka* valley area of Nu'uanu, L.C.A. 1470 reported 14 *lo'i*, one *kula*, and houses (Native Register Vol. 3:123), L.C.A. 1476 claimed 16 *lo'i*, one *kula*, and a house (Native Register 3:126) and L.C.A. 6233 claimed ten *lo'i*, one *kula* and a house lot (Native Register 5:261). Similarly, in Mokauea, in the upper

valley of the *ahupua'a* of Kalihi, L.C.A. 2710 included five *lo'i* and one *kula*, (Native Register 3:599) and L.C.A. 5560 claimed a *mo'o* and a house lot (Native Register 5:74). On the eastern flank of Honolulu, mid-valley Pamoa, in the *ahupua'a* of Manoa were taro fields, *kula* and house lots: L.C.A. 2216 claimed 17 *lo'i*, one *kula* and a house lot (Native Register 3:402) and L.C.A. 8559 claimed taro lands (Native Register 4:346). Thus, valley areas were utilized for both dry and wet agriculture as well as habitation.

A pattern also emerges for the coastal plain in the *ahupua'a* of Honolulu, adjoining the city of Honolulu. Another claim in Iwilei, L.C.A. 3142, included two *lo'i*, a house lot, a *pu'uone* (sand dune fishpond), and a *kula* (Native Register 4:63). Land Commission Award 918 was for a house lot only (Native Register 2:530). In the Kewalo area the claims also included fishponds: L.C.A. 1504 claimed three *lo'i*, a fishpond, a salt bed and a house lot (Native Register 3:138). Land Commission Award 2983 included four *lo'i*, a *kula* and a fishpond (Native Register 4:13). In neighboring Kalihi Kai, in the *Ahupua'a* of Kalihi, L.C.A. 2710 claims a house lot and "two pools for liberating fish [*N.R.* 3:599]".

While *lo'i* were most often found in the upland valleys and fish ponds were found along the coast, the plains surrounding Honolulu contained both, although the size of the agricultural area tended to be smaller as reflected in the number of *lo'i* claimed. Land Commission Award 1087 located in 'A'ala, on the west edge of Honolulu, contained a fishpond and a house lot (Native Register 2:66), while L.C.A. 657 at Kaumakapili, at the corner of Beretania and Nu'uanu, includes claims for two houses (Native Register 2:328). To the east of the city L.C.A. 10162 in Makiki claimed one *lo'i*, one *kula* and a house lot. (Native Register 4:517), and further past that, in Pa'akea, at the mouth of Manoa Valley in the *ahupua'a* of Waikiki L.C.A. 8033 includes two *lo'i* and a house lot (Native Register 5:480).

'Ili Kalawahine

The modern definition of Kalawahine as a land unit is:

> **The place above Roosevelt High School, Honolulu. Named for a deity who guarded water sources. In the last century 25 land parcels with this name were awarded to Hawaiians. [Pukui, et al 1974:77].**

However, our research indicates that Kalawahine was an *'ili* of the *ahupua'a* of Honolulu (*NT* 10:334), consisting of at least three *'ili lele* sections. Although no map has been found which delineates the entire boundaries of Kalawahine *'ili lele*, it is clearly discontinuous. The *mauka* section is east-northeast of Punchbowl Hill, (see Fig. 2), while the central section is in the area of the convergence of Nu'uanu and Pauoa Streams. A seaward section was also located in the Iwilei area. It is also possible that there are additional parcels within the *'ili lele* which have not been preserved in the available record.

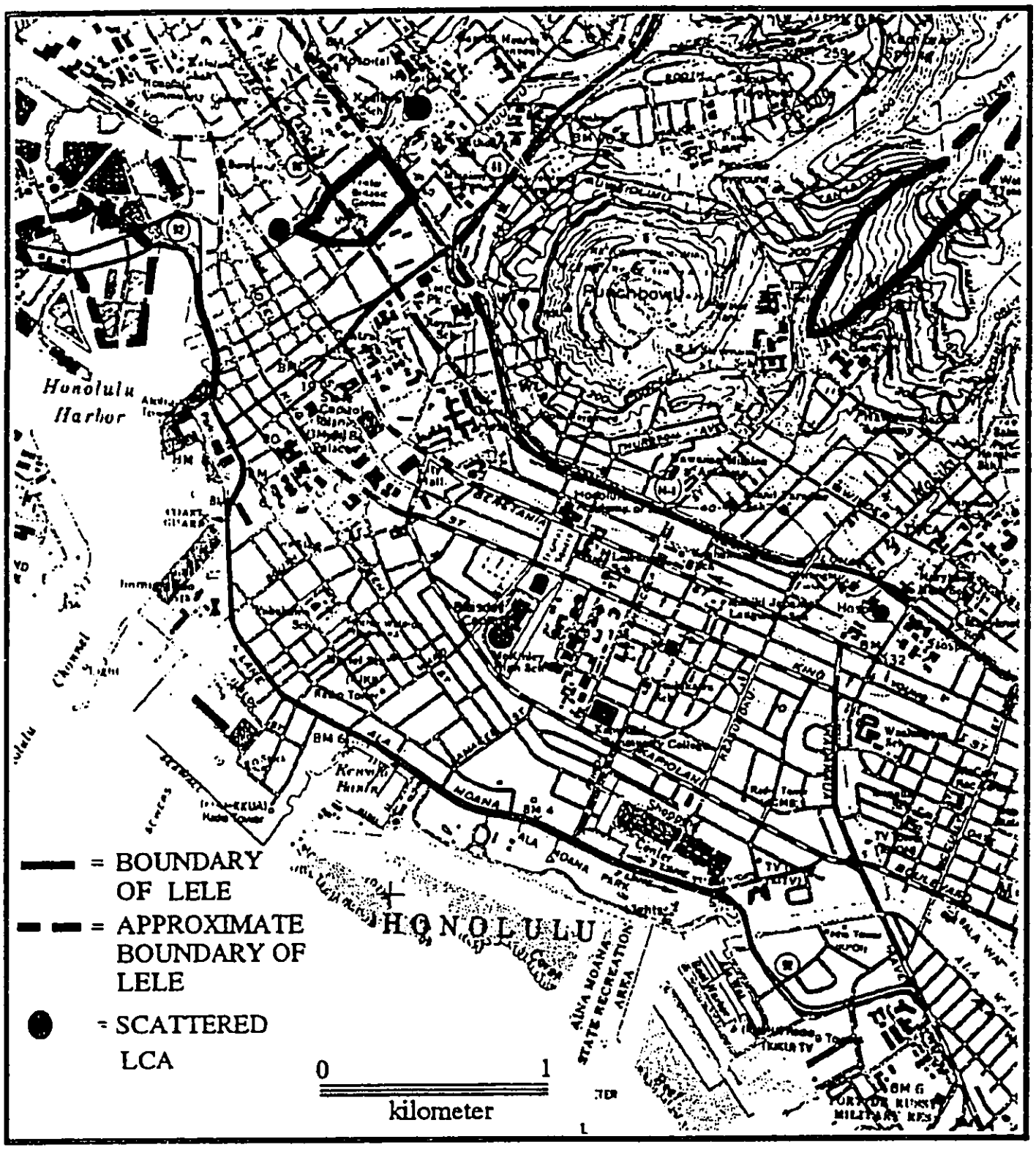

Figure 4. Boundaries of Kalawahine *'ili lele.*

Twenty-five commoner Land Commission Awards (L.C.A.) were awarded in Kalawahine with the *'ili lele* as a whole awarded to High Chief Aaron Keli'iahonui. Aaron Keli'iahonui was a son of the last ruler of Kaua'i, Kaumuali'i. Keli'iahonui held sections in Iwilei, present day Foster Botanical Gardens, as well as all of the *mauka* land above Roosevelt High School. While there is no indication that Keli'iahonui resided at any time in Kalawahine, the Native Register and Native Testimonies indicate that Keli'iahonui was most likely the *konohiki* (land manager) of the Kalawahine lands. The claimant in L.C.A.

727 stated that he was "living under Keli'iahonui," and that "Keli'iahonui now who is landlord" (Native Testimony 2:526). In five cases (L.C.A.'s 698, 795, 1037, 4678, and 1282) Keli'iahonui objected to the claims, indicating that he had an underlying interest in the land. Also in five testimonies (L.C.A.'s 727, 698, 935, 8321, and 1282) the claimants stated that their land is under the authority of the *konohiki*, and in two of these cases (L.C.A. 698 and 1282) Keli'iahonui objected to the claim. In only one claim was there specific mention of a *ko'ele* (land unit worked by a tenant for a *konohiki* or chief); L.C.A. 795 placed a *ko'ele*, not Keli'iahonui's, on the boundary of his property (Native Testimony 2:559). It is likely then, that some of Keli'iahonui's lands had been worked as *ko'ele*.

The L.C.A.'s awarded in Kalawahine were clustered in what is now Foster Botanical Gardens in lower Nu'uanu. At least 26 L.C.A. awards refer to Kalawahine; however other parcels that are indexed from Kamakela, Waikahalulu and 'Auwaiolimu in the *Indices of Awards*, are occasionally located adjacent to or near the Kalawahine awards on the maps examined, but for the purposes of this study only the 26 awards listed in the *Indices of Awards* for Kalawahine will be examined. Of the 25 *kuleana* awards, 16 awards involving 26 parcels were located on various maps. (See Tables 1 and 2).

In terms of land use, Table 3 indicates that taro was farmed on all but one parcel of land[2]. Taro fields were most often located adjacent to or nearby the claimant's house lots, indicating that the residents of this area of Kalawahine *'ili* had sufficient room in the A.D. 1850's to do small scale agriculture, and did not need to travel extensive distances in search of garden space.

Thirteen *pahale* (house lots) were recorded for Kalawahine: seven were found on Vineyard Street, three along Nu'uanu Street, one set back from Nu'uanu Street, one along Nu'uanu Stream and one could not be located. In general the *lo'i* (which also includes "patches" in Table 2) are in the interior of the blocks created by Nu'uanu Stream, School Street, Vineyard Street, Beretania Street and Nu'uanu Street, as are the *kula* (pasture) area. The *lo'i* and *kula* areas occasionally occupy the same parcel (L.C.A 5960 and 935), but the *lo'i* are more often located adjacent to a water source than are the *kula* (Wall 1893, Dodge and Wall 1893). Many of the original claims indicated that the claimants resided outside of Kalawahine, either in Honolulu, or the nearby areas of Kamakela and Waikahalulu. Again, all the located parcels are in the Nu'uanu Stream, School Street, Nu'uanu Street and Vineyard Avenue area.

0000 0026 2900

Table 1. Land Commission Awards in Kalawahine.

L.C.A. #	Awardee Name	Number of Apana	Number of parcels in Kalawahine		Acres
			Ascribed	Located	
141	Makahopu	3	3	1,2,3	1.24
698	Helela	2	2	1,2	2.42
715	Kalama	2	2	1,2	1.33
727	Kunane	3	2	1,2	0.96
795	Kaauhauhula	1	1	1	0.83
935	Keaka	2	2	1,2	1.62
1037	Hanunu	1	1	0	0.19
1042	Unauna	2	1	0	0.07
1240	Paahana	2	2	0	0.99
1282	Keliikanakaole	5	5	1	1.06
1585	Kalua	1	1	0	0.79
2938	Lahilahi	2	1	1	2.31
3072	Loiki	1	1	0	0.8
4678	Puiwa	1	1	1	0.34
5580	Kaapuiki	1	1	1	0.32
5957	Makaula	2	2	1,2	0.28
5960	Mahana	2	2	1,2	0.81
8207	Haupu	2	1	0	0.32
8241	'I'i	1	1	1	0.77
8321	Kamaile	1	1	1	0.24
8635	Kalawela	1	1	0	0.18
9119	Wood	1	1	0	2.82
10613	Paki	1	1	1	0.43
11082	Kaukoke	3	3	1,2	0.63
11100	Livingston	3	1	0	0.61
11215	Keli'iahonui	3	13	8	4.202
26	Totals	50	48		

Table 2. Map Locations of Kalawahine Land Commission Awards.

Map Name	LCA #	Awardee	Apana #	Other
Kamanuwai Block, (Dodge & Wall 1893, Map 1751)				
	11215	Keliiahonui	-	2 parcels
	715	Kalama	1,2	-
	11082	Kaukoke	2	-
	141	Makahopu	1,2,3	-
	2938	Lahilahi	1	-
	8241	I'i	1	-
	8321	Kamaile	1	-
	5957	Makaula	2	-
	8207	Haupu	1	-
	698	Helela	2	-
Nu'uanu and Vineyard North (Wall 1893, Map 1715)				
	935	Keaka	1,2	-
	727	Kunane	1,2	-
	11215	Keliiahonui	-	6 parcels
	5580	Kaapuiki	1	-
	698	Helela	1	-
	4678	Puiwa	1	-
	10613	Paki	1	-
	5960	Mahana	1,2	-
	11082	Kaukoke	1	-
	795	Kaauhauhula	1	-
	1282	Keliikanakaole	-	-
	5957	Makaula	1	-
Iwilei Section of Honolulu (Emerson 1883, Map 998)				
	11215	Keliiahonui	-	-
Tax Map 1:7:06				
	2938	Lihaliha	-	-
	8241	I'i	-	-
	141	Makahopu	3	-
	715	Kalama	-	-
	11215	Keli'iahonui	2	-
	8321	Kamaile	-	-
Tax Map 1:7:07				
	1282	Keli'ikanakaole	1	-
	11215	Keli'iahonui	2	-
Tax Map 1:7:08				
	935	Keaka	-	-
Tax Map 1:7:10				
	727	Kunane	2	-

Table 3. Land Use in Kalawahine, Based on L.C.A. Testimonies.

LCA #	Awardee Name	Recorded Land Use				Native Register	Native Testimony
		*Lo'i**	*Kula**	*Pahale*	Other		
141	Makahopu	-	1	1	-	V. 1, p. 124	V. 1, p. 100
698	Helela	1	-	3	-	V. 2, p. 360	V. 2, p. 509
715	Kalama	4	1	1	-	V. 2, p. 376	V. 2, p. 523
727	Kumane	5	-	2	-	V. 2, p. 386	V. 2, p. 526
795	Kaauhauhula	15	1	-	-	V. 2, p. 436	V. 2, p. 559
935	Keaka	6	-	1	-	V. 2, p. 546	V. 2, p. 609
1282	Keli'ikanakoele	6	-	3	-	V. 3, p. 54	V. 3, p. 242
2938	Lahilahi	-	1	-	vineyards,plants	V. 3, p. 702	V. 10, p. 83
4678	Puiwa	5	-	-	-	V. 4, p. 321	V. 3, p. 396
5580	Kaapuiki	1	-	-	-	V. 5, p. 80	V. 3, p. 513
5957	Makaula	3	-	-	-	V. 5, p. 189	V. 3, p. 611
5960	Mahana	4	1	1	-	V. 5, p. 190	V. 3, p. 612
8241	I'i	1	-	-	-	V. 5, p. 512	V. 3, p. 554
8321	Kamaile	2	-	-	-	V. 5, p. 533	V. 3, p. 150
10613	Paki	2	-	-	-	V. 4, p. 569	V.10, p. 239
11082	Kaukoke	1	-	1	sugar cane	V. 4, p. 633	V. 3, p. 610
16	Totals	56	5	13			

* Number of *Lo'i* or *Kula* plots specified

** Foreign Testimony

In sum, the Kalawahine L.C.A.'s were geographically located in this last area of land use, on the northern, residential edge of the expanding city. The land use of the middle of the Kalawahine parcel was similar to other parcels in this area: a few *lo'i*, *kula* and house lots. However, the *mauka* portion of the Kalawahine parcel does not fit into the pattern of *kula* and *lo'i*. In A.D. 1853 Serano E. Bishop described "brown Punchbowl with its dry slopes [Fitzpatrick 1989:9]," as a result of the roving herds belonging to missionaries. According to Fitzpatrick, Kanaha Stream, which forms the western boundary between *mauka* Kalawahine and Kewalo, was quite likely known as Po'opo'o Stream, a dry stream, during the mid-19th century A.D. The combination of the steep slope (15-40%) plus at best, an intermittent water source would make this area marginal for farming or residence, and may explain why no L.C.A. parcels were claimed here, or why there is no record of habitation during the second half of the 19th century A.D.

SETTLEMENT PATTERNS A.D. 1870-1900

Honolulu

The Nu'uanu Valley area was now a favorite residential area, with more than one fourth of the *haole* (foreigner) population in Honolulu settling there by A.D. 1884 (Lind 1980:70). Although it is difficult to determine when the majority of L.C.A. awards were sold or transferred, by A.D. 1893 there were substantially more houses on the land than had been mentioned in the land claim testimony, and at least eight lots partitioned from L.C.A. awards and held by non-Hawaiians are indicated (Wall 1893; Dodge and Wall 1893). Daws [1966:224] states that often Hawaiians tended to sell or lease their lands cheaply, and that "land ownership in Honolulu became (more) an index of rising foreign commercial interest." It is conceivable that as Honolulu expanded and the middle Kalawahine area became more developed during the second half of the 19th century A.D., the amount of land utilized for agriculture was reduced.

Kalawahine

Upon Ha'alelea's death sometime prior to A.D. 1867, his wife, A.A. Ha'alelea, inherited the *'ili lele* of Kalawahine. By A.D. 1873, many portions of the original L.C.A. 11215 holdings of Keli'iahonui had been sold and boundary disputes had arisen. The Boundary Commission determined that Mrs. Ha'alelea's land consisted of the *'ili'aina* of Iwilei on the coast, six lots in the Nu'uanu and School Street region, and 293.5 acres in back of Punchbowl Crater, between Makiki Ridge and Pauoa Valley[3]. In A.D. 1872 Mrs. Ha'alelea transferred power over her lands to J.H. Coney, and in A.D. 1875 sold him the *'ili lele* of Kalawahine, "together with the fishing ponds, lakes and fishing rights there unto belonging or appertaining (Libre 1872, 36:33)." At this point land use becomes ambiguous. The lower portions of the *'ili lele* were in the heart of Honolulu and were developed for residential and business use as the city grew. Although fishing rights were granted to Coney in A.D. 1875, it is questionable how long the fish ponds, on the coast of

Iwilei, in the midst of Honolulu Harbor, were workable. However, throughout this time period, and as early as A.D. 1854, the middle portions of the original Kalawahine parcel belonging to Keli'iahonui were being sold to individuals, often non-Hawaiians (Libre 1875, 44:52).

The surveyor C.T. Lyons in A.D. 1873 did not describe any current use of the *mauka* Kalawahine lands: "I didn't hear formerly that...Kalawahine had any *kula*, that they [sic] were mountain lands [Boundary Commission 1:225]." However, Lyons does mention that there was a settlement called Pi'iwai nearby in Kewalo, that was lived in by people from Makiki and Kewalo. Although there is no mention of Pi'iwai on the A.D. 1873 map of Makiki and Kewalo (Alexander 1873), the intersection of those two *'ili* snip off the base of the *mauka* Kalawahine land, on the side of Punchbowl, in the area of present day Pi'ikoi. If this is the area referred to by Lyons as Pi'iwai, this indicates that settlement had reached Punchbowl by A.D. 1873, but apparently had not expanded north into Kalawahine. This is supported by the A.D. 1873 map as well; there are no roads leading into the *mauka* portion of Kalawahine, they all end at Punchbowl. It is not until after A.D. 1900 that there is record of anyone settling in the *mauka* section of Kalawahine (Wall 1922), although it is possible that the area was utilized by nearby settlements for small scale agriculture as was necessitated by the demands of increasing populations.

SETTLEMENT PATTERNS A.D. 1900-1950

Honolulu

Honolulu maps from A.D. 1897 to A.D. 1920 indicate that while squatters may have moved into the *mauka* Kalawahine parcel around A.D. 1900, the city itself had not expanded into the area. In A.D. 1897 there was substantial development in downtown Honolulu, and substantial residential areas in the lower part of Nu'uanu Valley, *makai* of Punchbowl and in the Makiki/Punahou area at the base of Round Top (Monsarrat 1897). Other than Tantalus Drive, there were no other roads *mauka* of Punchbowl, and only one road in Pauoa Valley and two in Manoa. The ridges and valleys of Tantalus, Round Top, Kapalama and Kalihi were completely undeveloped at this time. By A.D. 1901, Punchbowl Road circled around the *mauka* side of the crater, and roads marking the beginning of development in Pacific Heights (Kapalama) were in place (Monsarrat 1901). However, Honolulu was still contained to the same area as in A.D. 1897; to the west, rice fields in Kapalama separated it from the small population in Kalihi, and to the east, rice fields separated it from Waikiki.

An A.D. 1912 map (Dove 1912) documents Honolulu's first tentative expansion into the valleys around Kalawahine. While there is still only one road in Pauoa Valley, a church and school are now present. Makiki Heights Road adjoins Tantalus on the ridge to the east of Kalawahine and another road leads into Makiki Valley. There are three houses located at the base of Tantalus Ridge, close to the southern edge of Kalawahine *'ili lele*. Residential development has increased in Nu'uanu and Manoa Valleys, however Honolulu

is still separate (in terms of residential continuity) from Kalihi and Waikiki by sparsely populated or undeveloped areas.

By A.D. 1920 the spread of Honolulu is continuous from Kalihi Kai to Kaimuki with substantial development within Nu'uanu, Manoa, and Kalihi Valleys (Bailey 1935). Pauoa Valley now has a few more roads and houses in addition to its church and school, and residential lots first appear on the side of Round Top. While there are still no roads in the Kalawahine area, the U.S. Experimental Station and the Lunalilo Home have been established at the southern tip of the parcel now owned by the Territory of Hawaii. (Monsarrat 1920). However, squatters were there regardless of a lack of city infrastructure, which does not appear in the area until A.D. 1935.

Kalawahine

In A.D. 1907 a series of transactions regarding the lands of Kalawahine occurred. On January 18th Laura A. Coney, wife and trustee of J.H. Coney, et al, sold the 293.5 acre parcel (previously referred to as the *mauka* lands of the *'ili lele*) to William Giffard and his wife (Libre 1907a, 287:245). Shortly thereafter, on the 1st of February, Giffard and his wife sold the same parcel to the Territory of Hawaii (Libre 1907b, 291:1). For the next 27 years the Territorial Government leased a few portions of the land, such as the six acres occupied by J.E. Monte (Wall 1922, Map 2055, enclosed as Map 2). The A.D. 1922 Hawaiian Territorial Survey Map *Kalawahine Slopes* indicates that up to 30 different parcels were occupied by squatters. Only two of the families claimed to have held deeds to their land. Five of the families did not reside on their parcels at that time, although each of those parcels included a structure, and two of them had potato fields. The average length of residence, according to the information contained on the A.D. 1922 map was 11.3 years; one family claimed residency since A.D. 1900, and six families claimed to have resided there for at least 20 years, but the largest migration into the area occurred between A.D. 1912-14, and included 12 families. The map indicates that the majority of the occupied lands were located near the top of the ridge that separated Kalawahine and Makiki, running downhill in the southern half of the parcel, with only a few areas being claimed along the Kahawai o ka Po'opo'o Gully (Kanaha Stream) to the north. The map indicates footpaths connecting many of the parcels, houses, and other structures of the squatters, as well as their fruit and vegetable plots (types unspecified). Potato fields, often overgrown, were abundant at this time, and usually surrounded the structures.

In A.D. 1934 the U.S. Congress passed Bill 8052: "To Amend Sections 203 and 207 Hawaiian Homes Commission Act" which allowed for part of the lands of Kalawahine, Kewalo and 'Auwaiolimu to be incorporated into the holdings of the Hawaiian Home Lands (Public Law 1934b). These lands were to be developed for residential purposes into lots that would be available to "native Hawaiians, who are given 99-year leases at nominal rentals" (Public Law 1934a). The parcel identified in the Act of 1934 consisted of "that portion of the land of Kalawahine (25 acres, more or less), *makai* of Tantalus Drive, and lying between the portion of the land of Kewalo...and the so-called 'Kalawahine lots,' in the district of Honolulu" (Public Law 1934b). This land is completely described in the

Congressional Act of 1937 (Public Law 1937): "to Amend the Hawaiian Homes Act, 1920," (an act that combined the A.D. 1934 act with others) as containing 31.6 acres within the 293.5 acres as "conveyed by W.M. Giffard to the Territory of Hawaii [75 Stat.498]," as mentioned above.

By A.D. 1920, records on Kalawahine indicate that "the lands...are occupied by squatters" (Public Law 1934a). Yet, according to the terms of the 1934 Act, any Hawaiians, whether native or not as defined by the Hawaiian Homes Commission Act of 1920, who were residing on the lands at the time of passage were to "be given first opportunity to lease such lands on which they reside" (Public Law 1934b). According to a Hawaiian Territory Survey Map (Bailey 1935), the residents were involved in small scale agriculture, including raising sweet potatoes, bananas, flowers, fruit trees, and vegetables, as well as raising chickens and pigs. In general the flowers, sweet potatoes, fruit trees and taro were located quite close to the houses; the chickens were usually on a separate parcel of land.

A survey entitled *Kalawahine Squatters* undertaken by the Board of Water Supply in A.D. 1935 indicates that there were over 240 people and 109 parcels of land occupied in Kalawahine. However, only 32 of these parcels appear on the A.D. 1935 map, the rest presumably located elsewhere in Kalawahine, outside of the 30 acres acquired by the Hawaiian Homes Commission, or more likely, on the Hawaiian Homes Commission land in adjacent Kewalo. In general the occupied parcels of land lay either along the dirt road/trail that runs north off of Mott-Smith Ave., fronting the Kahawai o ka Po'opo'o Gully, or along one of three trails that crosses down slope between the road and the gully. What appears to be a foot bridge and a larger plank bridge, cross the gully and provide access to a dirt road on the other side. Although money was appropriated for the construction of infrastructure in A.D. 1947, and applications for leases were made in A.D. 1945 and A.D. 1947, the leases were never issued, presumably because the future use of the land was uncertain.

In A.D. 1952, the U.S. House of Representatives passed Bill 4197, entitled:

> **A bill to withdraw and restore to its previous status under the control of the Territory of Hawaii certain Hawaiian homelands required for the use of the Board of Water Supply of the City and County of Honolulu for the location of a water shaft, pump station, and tunnel, and to amend section 203 of the Hawaiian Homes Commission Act, A.D. 1920, so as to confer upon certain lands of Auwiaolimu, Kewalo-Uka and Kalawahine, on the island of Oahu, Territory of Hawaii, the status of Hawaiian Homelands (Public Law 1951a).**

This bill required the ownership of these lands to revert back to the Territory of Hawaii so that they could be developed for use by the Board of Water Supply. The earlier bill was also amended to continue to allow residents of 'Auwaiolimu and Kewalo-Uka to lease their lands, but required residents "in the case of said Kalawahine lands, (to lease) other similar lands under the control of the Hawaiian Homes Commission" (Public Law 1951:6).

In A.D. 1950 the squatters on the sloped portion of Kalawahine that reverted back to the territory were forcibly relocated; they were given first choice of the homestead parcels that were being developed on the flat lands just to the west. According to Mrs. Esther Kekoa (personal communication, 1991) everyone had to tear down their houses and remove their possessions. A bulldozer subsequently cleared the area of any remaining structures, often pushing trash and building materials into large piles. Mrs. Kekoa indicated that as far as she remembered, only the residences of McShane, Santos, and Maui were spared (See Map 2). Mrs. Kekoa also noted that approximately 12 families located on the *makai* end of the parcel refused to leave at this time, however she did not know what became of them. Mrs. Kekoa states that prior to A.D. 1950, the squatters grew vegetables, sweet potatoes, and fruit trees on the land; her family had a cement lined *lo'i*, but due to a lack of water very few others attempted to grow taro. One resident, Andrew Asagra, however, used a wooden flume to irrigate his crops in the up slope southern portion of the parcel.

In A.D. 1990 the land again reverted back to the Hawaiian Home Lands Commission. At present two families reside on the property, and three other families returned to claim land in Kalawahine under the A.D. 1934 Bill. All of the currently occupied parcels of land are located adjacent to Kalawahine Place, the dirt road on the earlier maps (Wall 1922, Bailey 1935).

Regarding the presence of modern burials in the project area, Mrs. Kekoa also noted that as far as she knew, all local residents were buried in the cemetery at Wilder and Pensacola Avenues. While pursuing archival research however, we encountered a Mrs. Nina Asing who mentioned that she was aware of family burial plots on Lot 3. Mrs. Asing was researching the area to facilitate her family's obtaining a Hawaiian Home Lands lease for Lot 3. We were unable to contact Mrs. Asing for further details.

PREVIOUS ARCHAEOLOGY

In A.D. 1930 J. Gilbert McAllister catalogued a total of 384 sites on the Island of O'ahu. Of these 384 sites, 45 were located in Kona District; 16 are *heiau* and 14 are fishponds. The other catalogued sites in Kona are comprised of house sites, geological features, agricultural features, temporary shelters, burial caves, pools, and geographic locations associated with legendary or mythical events (McAllister 1971:57-101). No sites located by McAllister were found within the project area, although he does mention the presence of two other *heiau*, Kahuoi and Kaheiki, on the backside of Punchbowl which are somewhat near Kalawahine (McAllister 1971:82).

Field survey of the Kanealole and Moleka Stream systems in Makiki Heights (Yent and Ota 1980) is the only archaeological survey done in the Makiki and Pauoa area. A variety of feature types were observed in this survey, including retaining walls, terraces, rock shelters, free standing walls, planting holes, *lo'i*, platforms, enclosures, walled depressions, a historic dump, a pipeline, an old carriage road, a ditch, and a water tank. Most of the features are agricultural features associated with the retention of soil. It could

not be determined if stream water was channeled or not (Yent and Ota 1980:50). Both Kanealole and Moleka stream systems were used after A.D. 1778 (post European contact) but no definitive evidence of pre-Contact use was found. The stone structures could indicate either post-contact or pre-Contact use. Most of the possible pre-Contact features are located on the lower slopes along Kanealole Stream (Yent and Ota 1980:50). The bottles found in a historic dump (Feature 5M) indicate historic use of the area in the late 18th and early 19th centuries A.D.

SURVEY METHODOLOGY

Archaeological field work included (1) an archaeological pedestrian survey, (2) mapping and recording of all located archaeological features, and (3) archaeological excavations of selected features. Field work was undertaken November 18 through December 1, 1991 by a 3-4 member crew. Pedestrian sweeps of the 12 acre project area were oriented north-south, beginning at the north (*mauka*) end of the parcel. Crew members were usually spaced at 10 m intervals, except where the vegetation was particularly thick, at which point members were spaced at 5 m intervals. The easternmost edge of each sweep was flagged so that the adjacent sweep would be properly spaced. Archaeological sites and features were flagged using temporary numbers as they were encountered. Given the density of vegetation in the project area, little or no clearing was undertaken.

The pedestrian survey of the 12 acre Kalawahine parcel with 100% coverage (except for where vegetation was prohibitive) led to the identification of five different sites comprised of 38 features. These features are depicted in Figure 5. Initially, eleven temporary numbers (T-#) were assigned during the sweeps. After completion of the pedestrian sweeps, it became obvious that six of these sites could be eliminated by combining T-1, T-2, T-3 and T-10, T-5 with T-6 and by discounting T-4 and T-11. The resulting five sites were then assigned numbers according to the State Inventory of Historic Places (SIHP) system, fully described and mapped.

These sites, known as 4434, 4443, 4444, 4445 and 4446, were designated based on clusters of features or the close proximity of one single feature to another single feature. Each feature within a site was given a letter designation starting with A, ending with Z and if necessary, continuing with AA and so on. All azimuths used to describe the location of features are given according to Magnetic North (11.5° off True North).

Twentieth century debris was scattered in varying concentrations throughout the project area. A number of features and/or sites represent dumping ground for such debris. Debris included entire bottles as well as broken glass, rusting strips of corrugated tin, pots and pans, cutlery, appliances, the remains of abandoned automobiles, batteries, etc. Bricks and pieces of concrete were usually found in and around potential residences and house platforms. Every piece of debris examined by the crew dated between turn-of-century through present-day material. In two cases the concentration of debris was unusually high. These areas represent 20th century A.D. disposal areas.

It appeared that all features were 20th century A.D. in age. In order test this hypothesis, limited subsurface testing was conducted at four separate features within Site 4434. A 0.5 x 0.5 m test unit was excavated in Feature G, a rock shelter with an associated wind break. It was thought that any evidence of pre-Contact activity within the project area would be present within the shelter itself. Two 1 x 2 m test units were excavated in Features L and AA, two possible agricultural terraces. The last test unit, a 0.5 x 0.5 m unit, was placed in Feature V, a level terraced area which could have served as an agricultural terrace or house platform.

SITE DESCRIPTIONS

SITE 50-80-14-4434

Site 4434 is the largest of the five sites, both in size (7229 $m^{2)}$ and number of recorded features. Site 4434 is located in the lower middle portion of the project area, extending from the Kanaha Stream (74 m/240 ft elevation) up slope to the eastern boundary of the project area (95 m/310 ft elevation). The terrain in the immediate area consists of a stream bed (15-50 m wide) adjacent to steep and rough mountainous land (Foote 1972:119). Vegetation observed within this site includes bermuda grass (*Cynodon dactylon*), banana poka (*Passiform mollissina*), bougainvillea (*Bougainvillea spectabilis*), coffee (*Rubiaceae sp.*), and bamboo (*Bambusa vulgaris*), as well as guava (*Psidium sp.*), surinam cherry (*E. uniflora*), *lehua* haole (*Calliandra inaequilatera*), koa haole (*Leucaena leucophala*), tangerine (*Citrus sp.*) and banyan (*Ficus sp.*) trees.

Site 4434 contains 32 (84%) of the 38 identified features. Twenty-two (69%) of the features are terraces (see Figure 6). Also included in 4434 are two rock shelters, two stone mounds, three depressions, five alignments, two platforms, one paved area and one large 20th century A.D. dump. Site 4434 appears to be post-Contact. The entire site is saturated with modern debris, particularly Feature O. Moreover, many of Site 4434's terraces were constructed utilizing pieces of corrugated tin. Test excavations of four of Site 4434's 32 features also indicate modern utilization, primarily from A.D. 1900 to A.D. 1950. It appears that the majority of features at Site 4434 served an agricultural function. These include the terraces used to sculpt the steep slope along the stream. Based on subsurface material remains and overall dimensions, only the rock shelters appear to have served a habitation function.

Feature A Terrace:

This feature is a terrace face measuring approximately 12 m long by 0.9 m wide. It is two courses high and is oriented along a 145° northeast-southwest axis.

Feature B Terrace:

This feature incorporates a natural outcrop to form an angled stone-faced terrace, with the longest section running roughly north-south for a distance of 7.5 m. At the

southern end this face angles 150° up slope for a distance of 2.5 m. The terrace face is 1 to 4 courses high with a width of no greater than 1 m and a height of 0.9 m.

Feature C Stone Mound:

This feature, an ovoid-shaped mound situated between two boulder outcrops, measures 2.2 m east-west by 1.7 north-south and is 0.4 m high. It is located 7.9 m northeast of Feature B, described above.

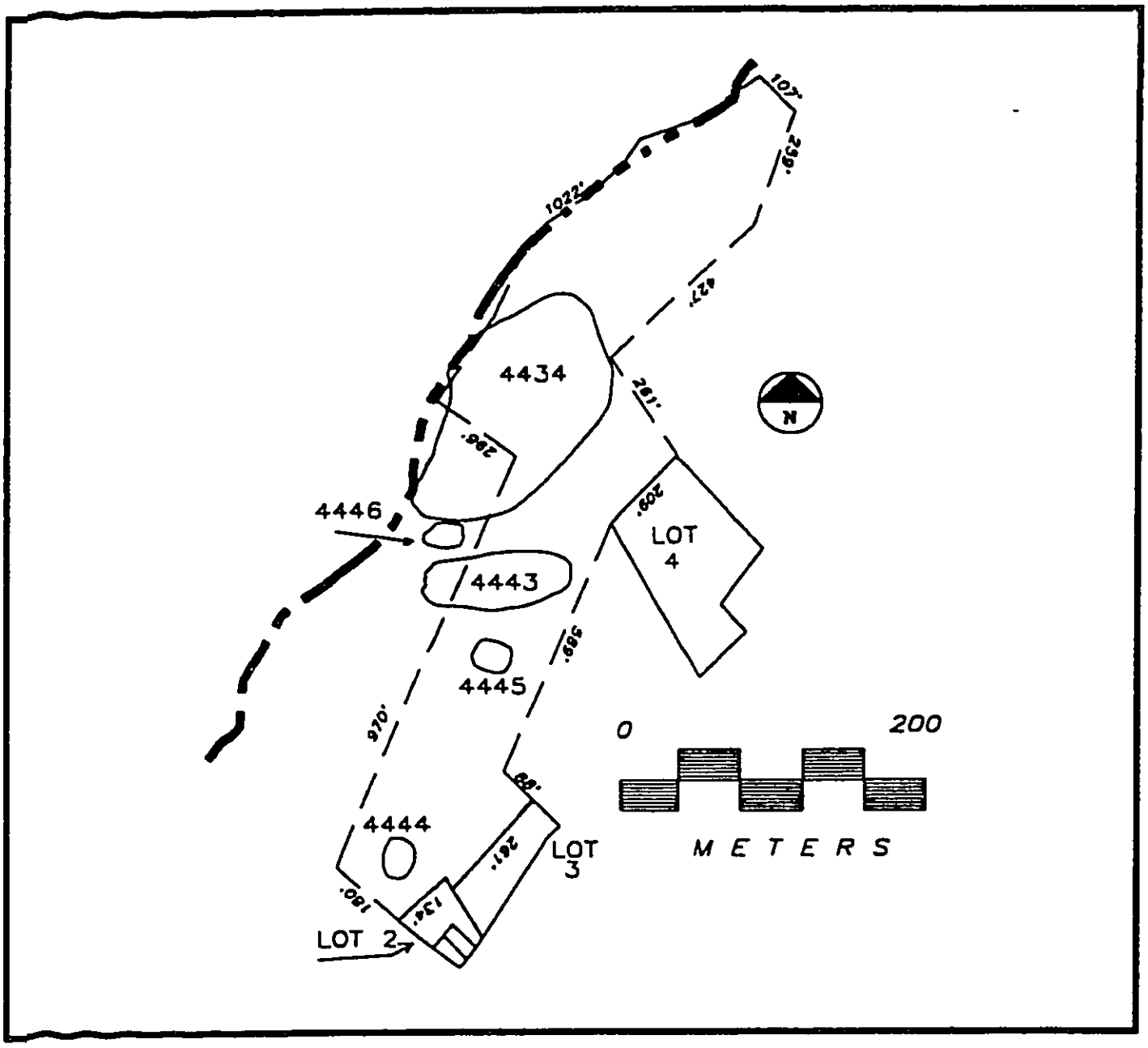

Figure 5. Archaeological sites within the project area boundaries.

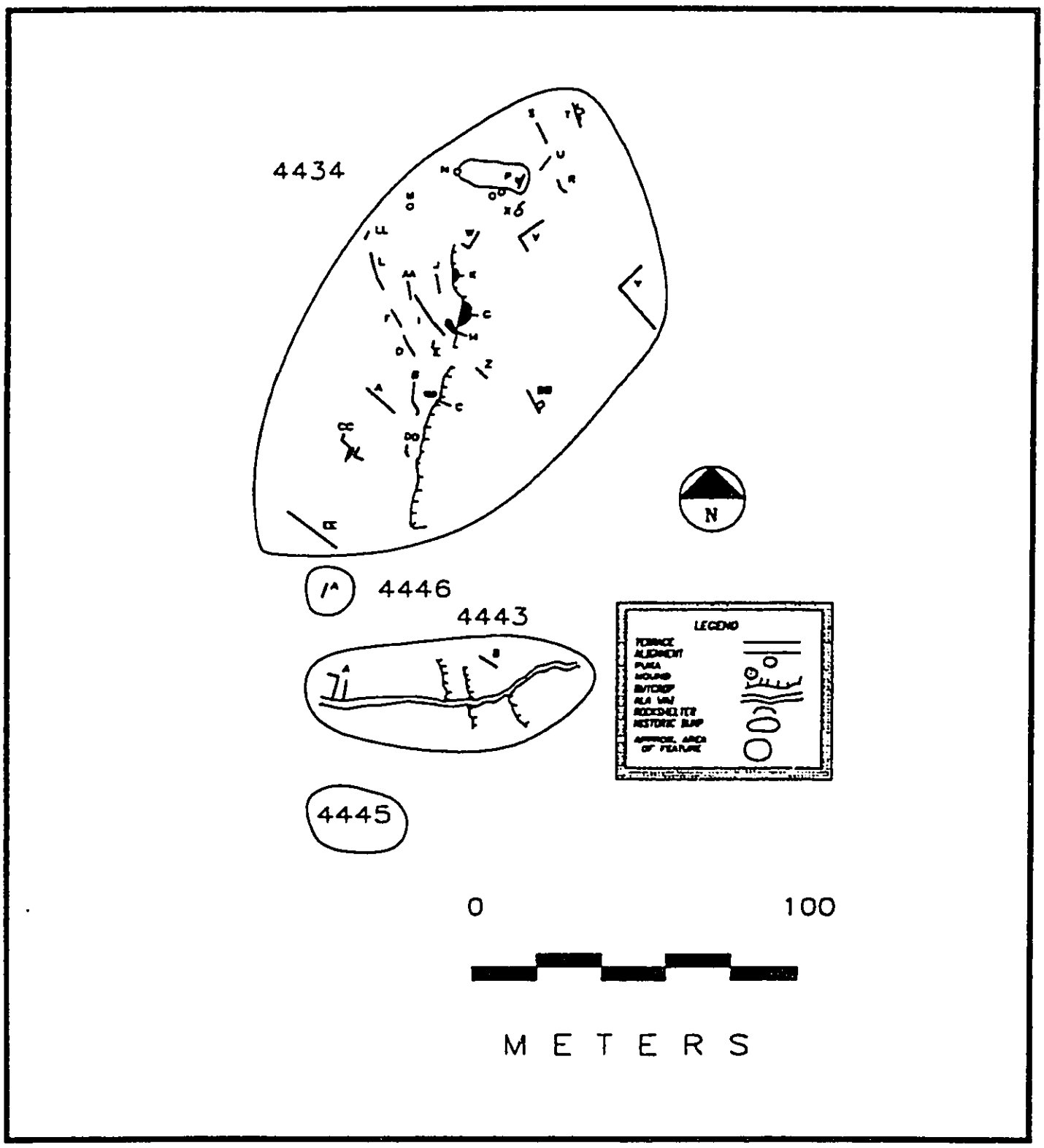

Figure 6. Archaeological features broken down by site, excluding Site 4446.

Feature D Terrace:

Feature D incorporates three large boulders to form a terrace face which is approximately 7.7 m in length, 1.7 m in width and 0.9 m in height. It is situated along a northwest-southeast axis (322°) and is the southeastern most in a series of four terraces all running in a line along roughly the same axis.

Feature E Terrace:

Feature E is comprised of four boulder outcrops which have been modified to form a terrace. The terrace face measures roughly 2 m in length, 0.6 m in width and 1 m in height. It is 3 to 4 courses high and situated 5 m up slope of Feature D at a 62° bearing.

Feature F Terrace:

This feature is approximately 2.5 m north of Feature D and is second in the series of four terraces along a 322° axis. Its face measures 6.3 m long by 1.85 m wide and is 0.85 m high.

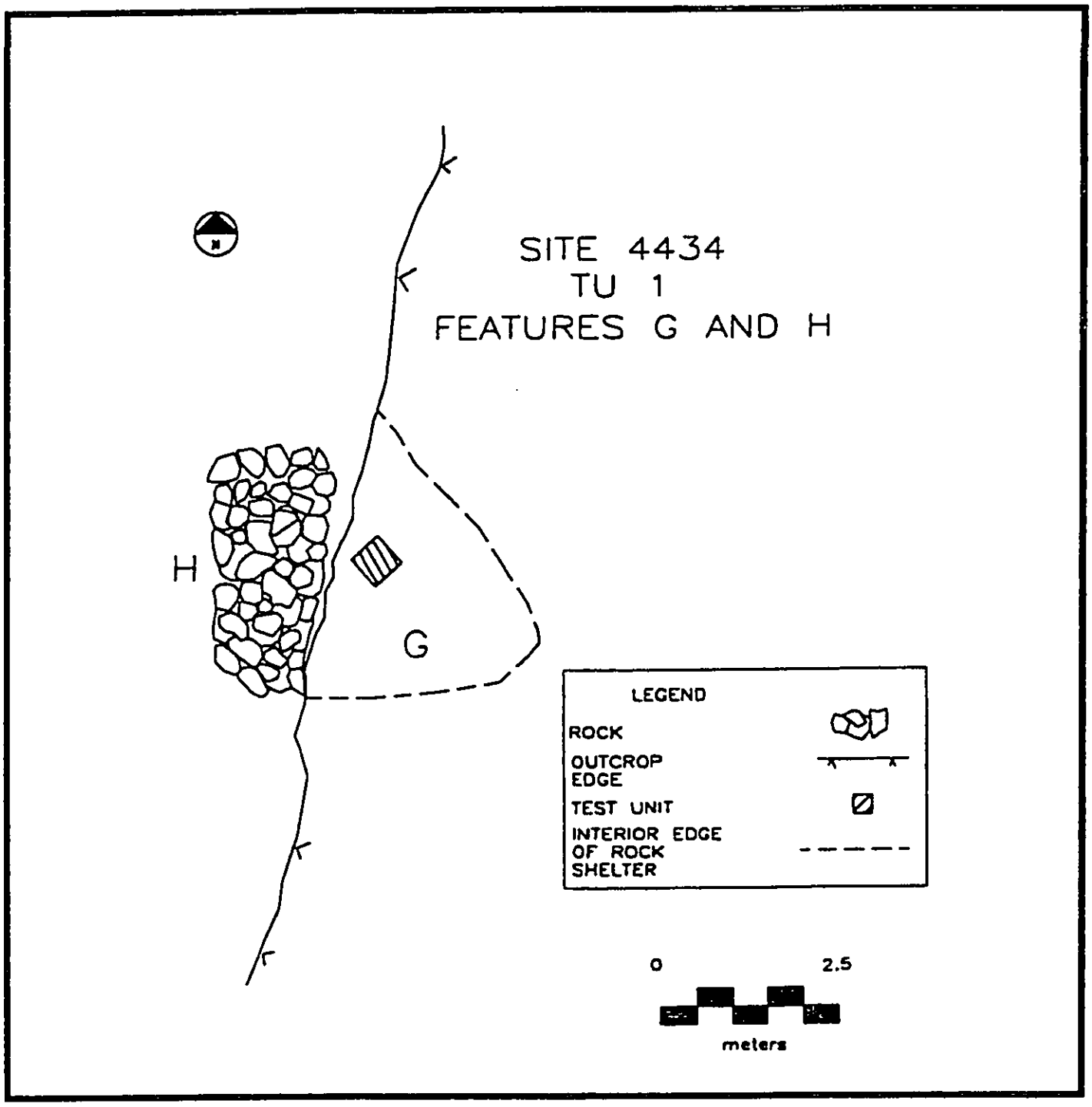

Figure 7. Features G and H of Site 4434.

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Feature G Rock Shelter:

This feature is located in a natural outcrop which runs above and below the western extreme of the project area boundary. It measures 4 m long, 3 m deep and at its mouth, 0.8 m high. Located in the northeastern corner of the rock shelter is a narrow cavern which is also approximately 3 m deep. Partially blocking the entrance to the rock shelter is an ovoid-shaped stone mound (Feature H), which we believe to have been utilized as a windbreak.

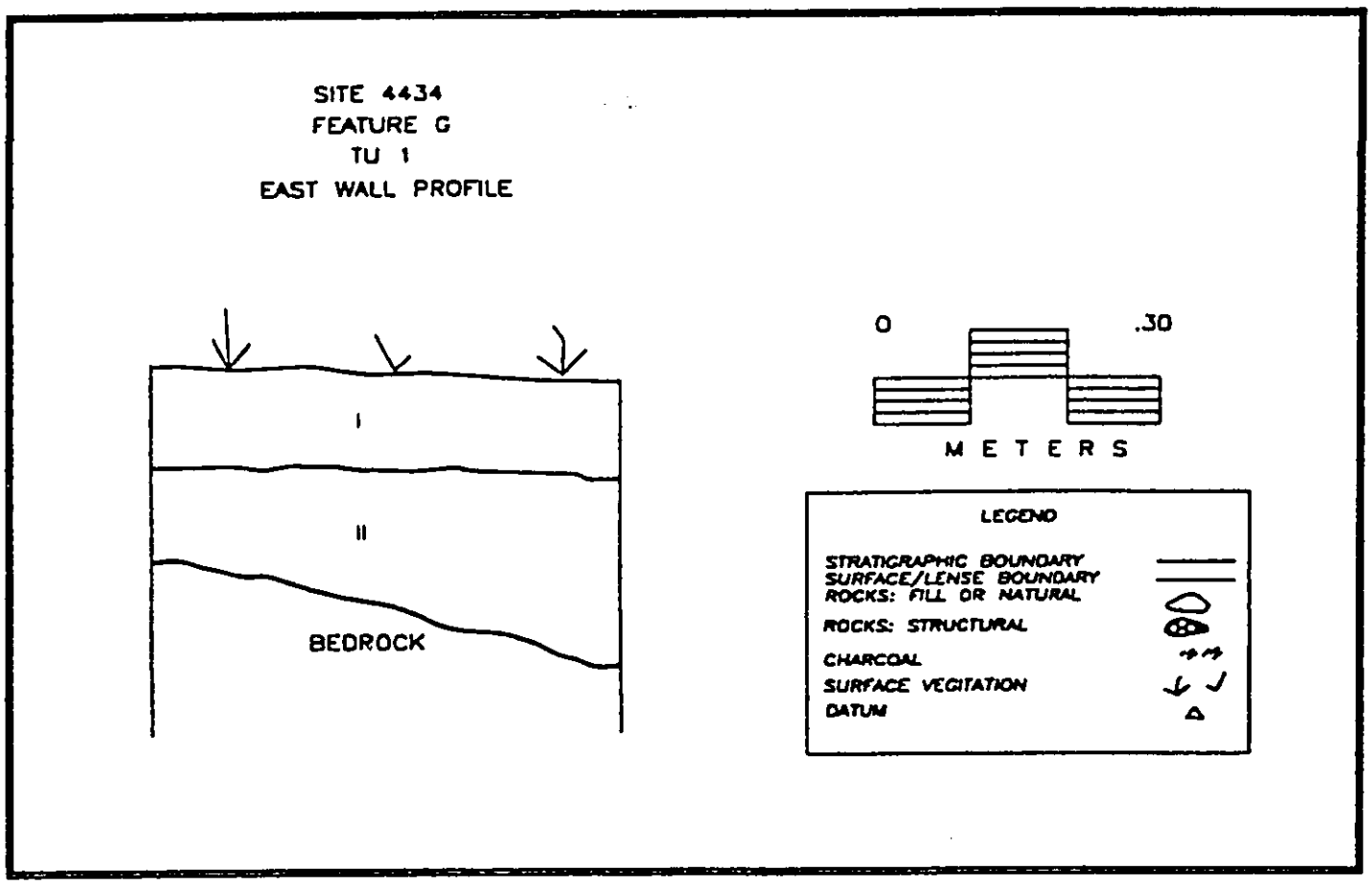

Figure 8. Stratigraphic profile of TU 1.

Feature G, the largest of 2 rock shelters identified within the project boundaries was chosen as one of four excavation test sites. A 0.5 x 0.5 m test unit (TU 1) was excavated in the central interior area of the rock shelter. TU 1 was excavated in 10 cm levels following natural stratigraphy and all soil removed was screened through 5 mm mesh. Excavation ceased when bedrock was reached at 42 cm bs and revealed only glass fragments, some charcoal (48.3 g) and a few metal pieces. The presence of only post-contact materials both within and around the rock shelter suggests an exclusively modern (A.D. 1900 - A.D. 1950) use .

A profile of the east wall identified two stratigraphic layers (see Figure 8):

Layer I: 0-13 cm bs	Very dark brown (10 YR 2/2) dry silty clay loam with pebble, cobble and root inclusions; cultural material including charcoal, glass and metal.
Layer II: 13-33 cm bs	Yellowish red (5 YR 4/6) silty clay loam with roots, rootlets, a few pebbles and small cobbles; cultural material including charcoal, glass and metal.

Table 4. TU 1 Artifacts.

Type	Layer I Level 1	Layer II Level 1	Level 2	Total Per Type
Glass Fragment	3	1	-	4
Metal Fragment	1	9	3	13

Layer I is the only layer associated with cultural activity; artifacts found in Layer II were present only in its boundary with Layer I. The metal fragments recovered from the screening of soil from Layer II Level 2 are the result of wall fall.

Feature H Stone Mound:

This ovoid-shaped mound is located directly in front of Feature G and while not tested, most probably is associated with the rock shelter, possibly as a wind break. It measures 3.5 m long by 1.6 m wide and is 0.5 m high.

Feature I Terrace:

This is the largest terrace identified at Site 4434 and while slightly curved in the center, its face measures 16 m long, 2 m wide and 1.5 m high. It is 5.3 m north of Feature E and is situated on a northwest-southeast axis.

Feature J Terrace:

This feature is a stone-faced terrace measuring 5.6 m long, 1.5 m wide and 0.9 m high. The long axis of the terrace runs 336° and it is situated 6.75 m east of Feature I.

Feature K Rock Shelter:

While located in the same outcrop as Feature G this rock shelter is much smaller in overall dimension, measuring only 2.3 m long, 1.7 m deep and at its mouth, 0.5 m high. It is situated 5.2 m up slope of Feature J at a bearing of 340°.

Feature L Terrace:

This is an outcrop which has been modified to form a slightly bowed and irregular terrace face four to five courses high. It measures 12.3 m long, 0.85 m wide and 1.4 m high.

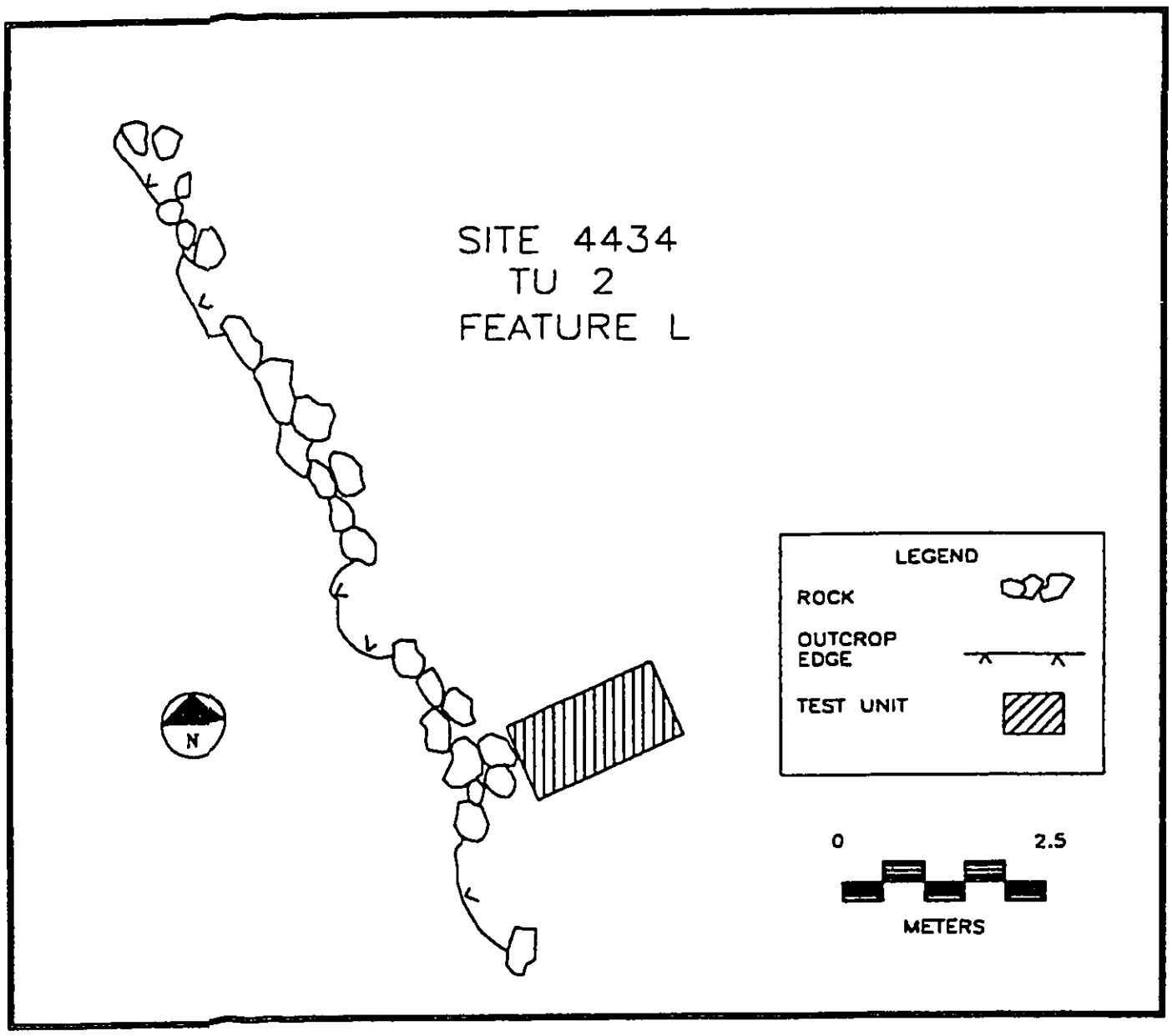

Figure 9. Feature L of Site 4434.

Feature L was one of two possible agricultural terraces chosen as an excavation test site. TU 2 was a 1 x 2 m unit situated 1.1 m west of the terrace face. The unit was placed so that its long axis ran up slope at a 246° to the terrace face. Because TU 2 was mainly excavated for stratigraphic information, it was decided that observing arbitrary levels and screening removed soil was unnecessary. Based upon the glass recovered, in TU2, it appears that Feature L is post-Contact in age.

A profile of the north wall identified two stratigraphic layers (see Figure 10):

Layer I 0-17 cm bs	Very dark grayish brown (10 YR 3/2) silty clay loam with abundant roots and moderate small to medium cobbles; cultural material included a glass fragment and a marble.
Layer II 17-32 cm bs	Dark gray (10 YR 4/1) silty clay with moderate roots and a few small cobbles. Sterile.

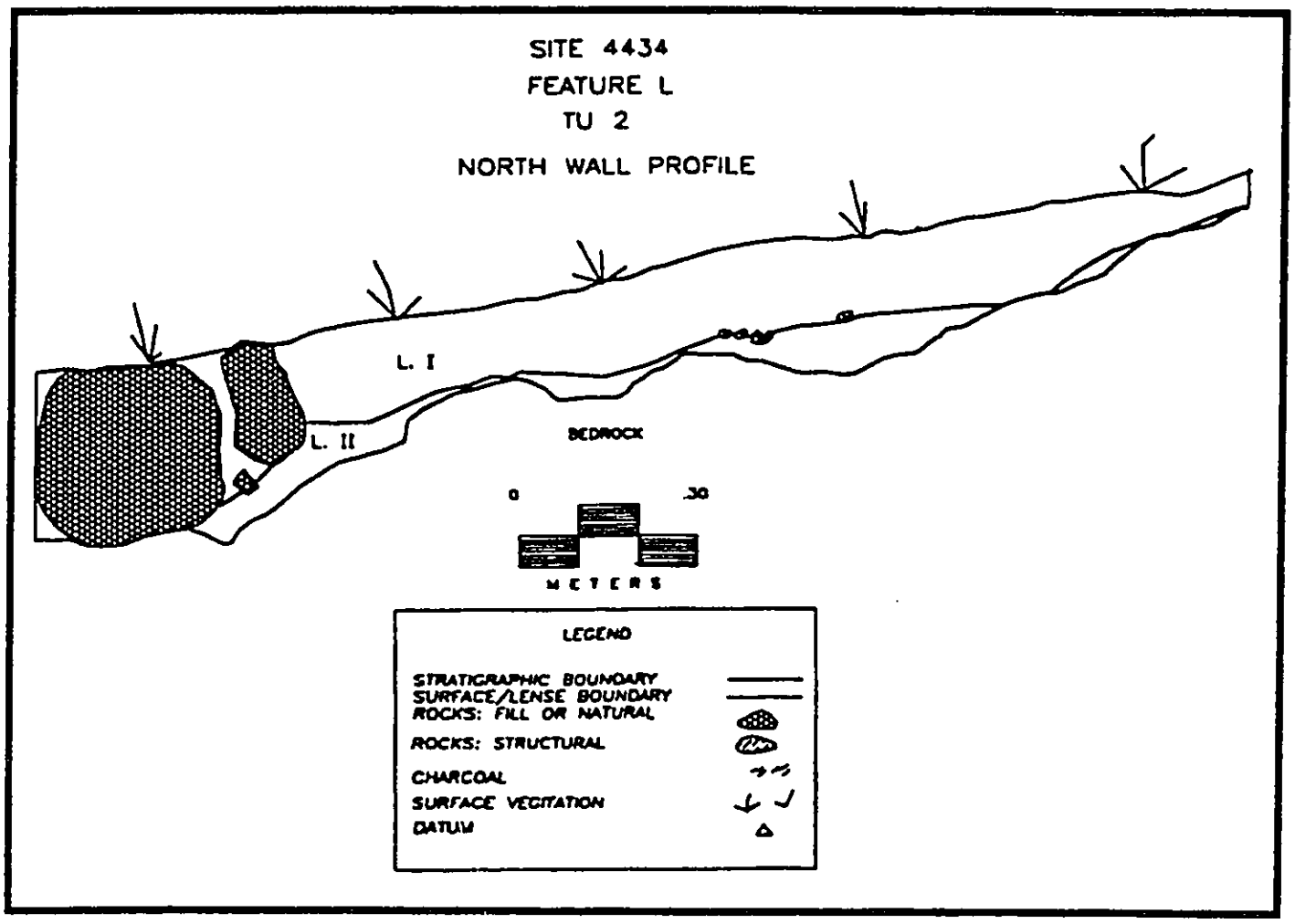

Figure 10. Stratigraphic profile of TU 2.

Table 5. TU 2 Artifacts.

Type	Layer I Level 1	Layer II Level 1	Total Per Type
Glass Fragment	1	-	1
Marble	-	1	1

Feature M Circular Depression:

This is a 0.2 to 0.3 deep partially stone-lined depression measuring 1.7 m north-south by 1.35 m east-west. It is situated approximately 17 m northeast of Feature LL and may have served as an outhouse.

Feature N Ovoid Depression:

Feature N is an ovoid stone-lined pit with interior east-west and north-south diameter of 1.07 m and 1.3 m, respectively. The interior height of the pit ranges from 0.65 m to 1 m. The exterior width of the feature is 2.8 m and it is located roughly 17 m northeast of Feature M.

Feature O Twentieth Century Dump:

This feature is a 20th century A.D. dump covering roughly a 10 x 15 m area midway between Features V and Q. The historic debris in this area includes but is not limited to, mid to late 20th century glass bottles and bottle fragments, other types of glass, ceramics, tin and metal.

Feature P Terrace and Platform:

Feature P is located 4.75 m almost due (magnetic) northeast of Feature Q. The terrace face is roughly 3.25 m in length, 0.7 m high and 0.6 m wide. Its long axis is 107°. Abutting this terrace is an earthen filled semi-circular platform which has an average interior dimension of 1.75 m and an exterior east-west width of 2.7 m. The platform is 0.6 m (3 to 4 courses) high and incorporates two large boulders in its face.

Feature Q Circular Alignment:

This feature, which is located 14.75 m east of Feature N, is a circular stone alignment which incorporates one large boulder (1 m x 0.7 m) in its construction. It is 1.8 m long, 1.25 m wide, 0.35 m high (one course) and has a long axis of 117°.

Feature R Elongated C-Shape Alignment:

This structure is formed by modification of the space between two large boulders. The single course alignment which fills the space measures 4.4 m long, 0.95 m wide, 0.75 m high and has a long axis of 319°. From the ends of this alignment, each boulder protrudes (to the northeast) approximately 3.5 m. The C-Shape is located roughly 12.8 m northeast of Feature P.

Feature S Linear Alignment:

This feature, albeit poor in quality, is a stone alignment situated directly beneath a banyan (*Ficus sp.*) tree on the northern end of the project area. It is 6.8 m long, 0.6 m wide, 0.7 m high and has a long axis of 330°. It is located 5.5 m northwest of Feature U.

Feature T Alignments:

This dual component feature is the northernmost feature identified in the project area. One and a half meters up slope of the straight alignment (9.5 m L x 0.4 m W x 0.34 m H) is an awkwardly shaped stone alignment that resembles two L's which have been positioned so that the long back of each L faces the other. While connected at the top, these L-shaped alignments are not equal in size. The northernmost (backward) L has a bottom length of 2.5 m and a back length of 2.3 m. It's average width and height are 0.3 m and 0.15 m respectively. The other L has a bottom length of 2.2 m and a back length of 3.2 m. It's average width and height are 0.25 m and 0.2 m respectively.

Feature U Linear Alignment:

Feature U is located 6.8 m west of Feature R at a 328° bearing. It is a simple stone alignment 5.9 m long, 0.7 m wide, 0.25 m (one course) high and has a long axis of 207°.

Feature V Semi-Circular Terrace:

This feature is believed to be an outcrop which was modified to form a terrace with a possible agricultural or habitation function. It is located 5.2 m up slope of Feature X at a 178° bearing. Between the outcrop which has been modified to form the terrace face and an outcrop 6.0 m directly to the east, is a slightly uneven earthen filled surface. The overall interior length of the terrace face is roughly 14.8 m. It's average width is 1.1 m and its height is 1 m.

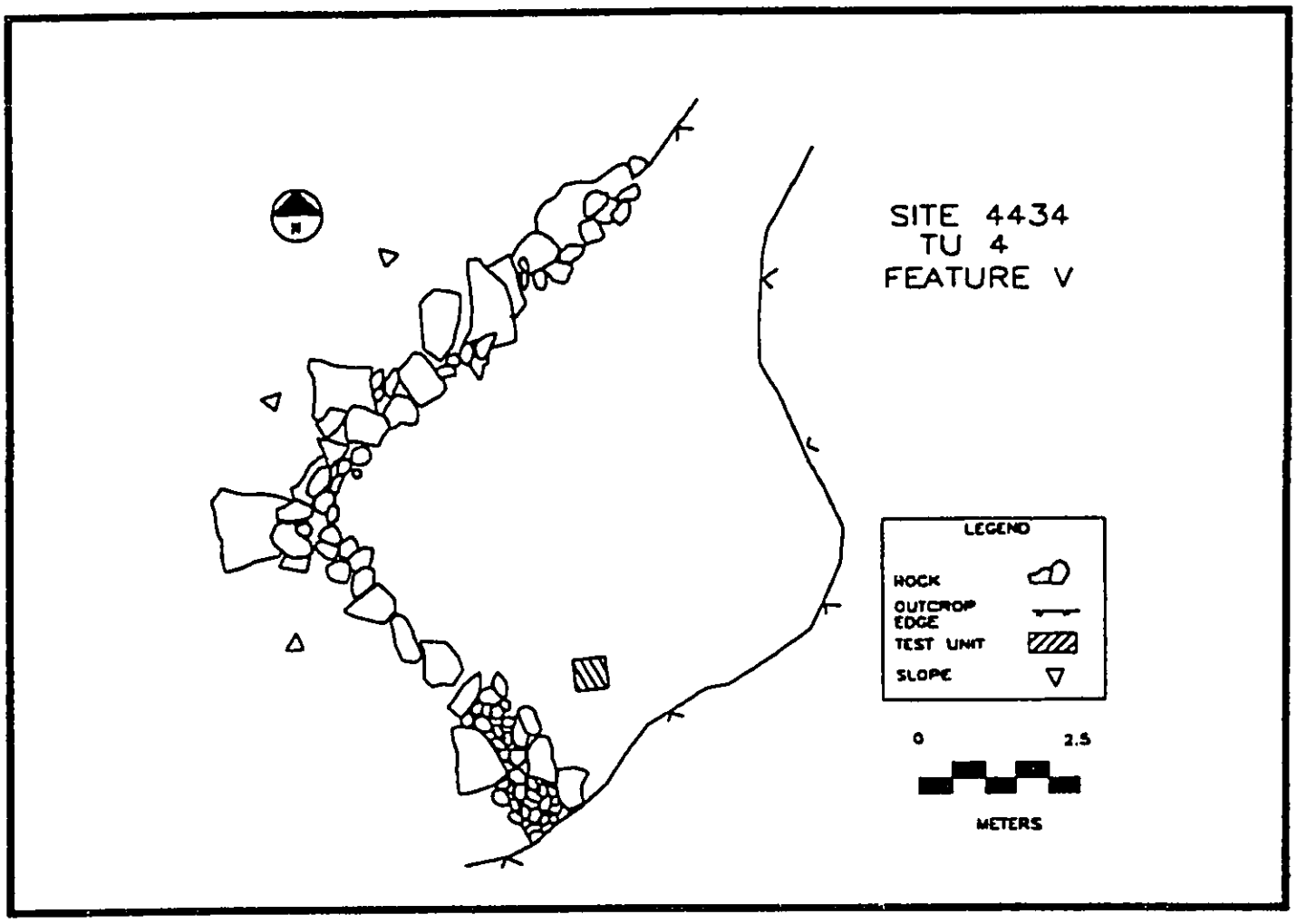

Figure 11. Feature V of Site 4434.

Feature V, because of its location and initially perceived quality in relation to the other features in the area, was chosen as an excavation test site. A 0.5 x 0.5 m unit (TU 4) was placed in the southeastern corner (84° east-west orientation) of the earthen surface above the terrace face. TU 4 was excavated in 10 cm levels and all soil removed was screened through 10 mm mesh. Test excavations here produced no cultural material; pre-Contact utilization of this feature is unlikely due to the extensive amount of modern (A.D. 1900 - A.D. 1950) debris scattered on its surface and in the surrounding area.

A profile of the east wall identified three stratigraphic layers (see Figure 12):

Layer I: 0-2 cm bs	Surface humus. Sterile.
Layer II: 2-11 cm bs	Very dark brown (10 YR 2/2) medium grain soil, with abundant fine roots. Sterile.
Layer III 11-36 cm bs	Very dark grayish brown (10 YR 3/2) medium grain soil, compact with large and small roots, pebble and gravel inclusions. Sterile.

Layer IV: 20-27 cm bs (SE corner only)	Thick dark gray (10 YR 4/1) clay lense. Sterile.

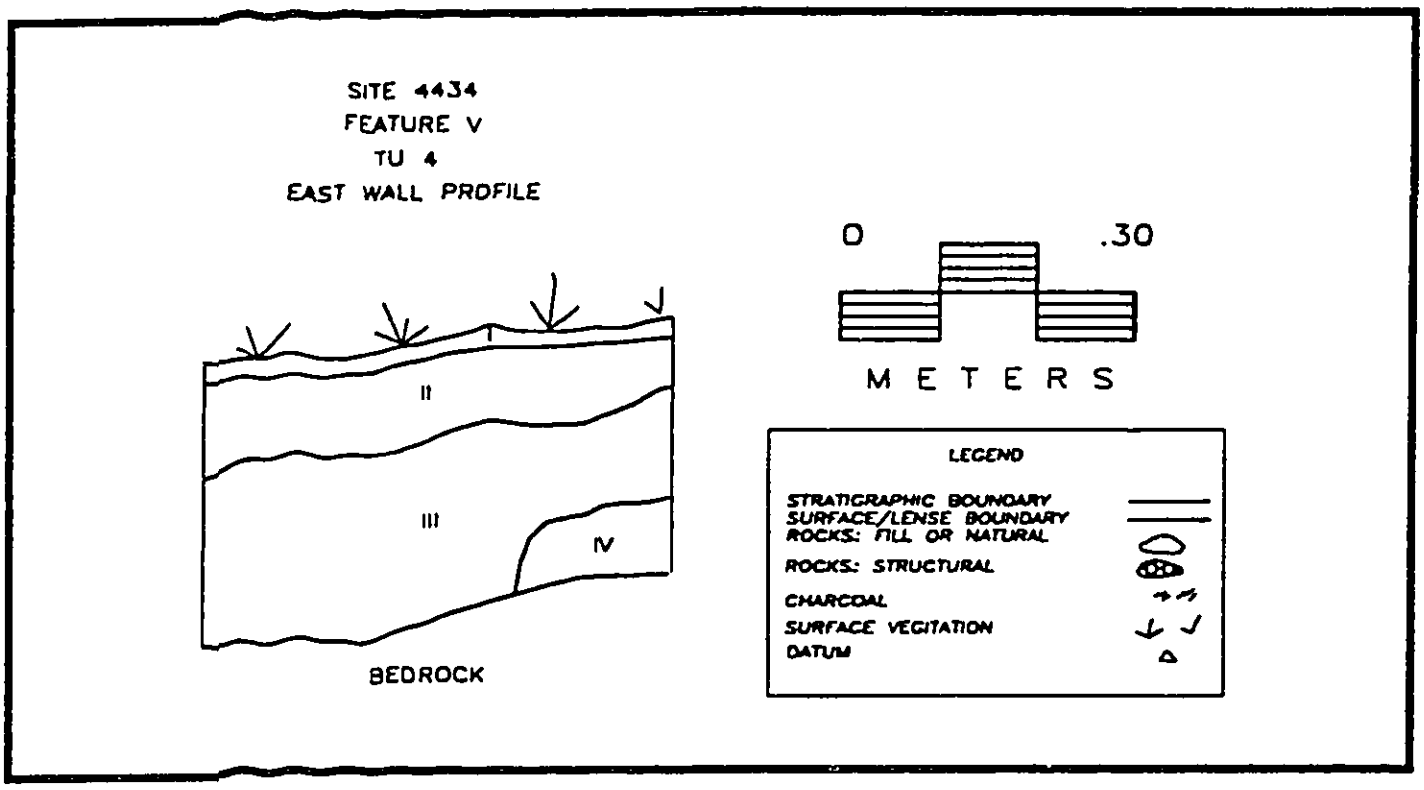

Figure 12. Stratigraphic profile of TU 4.

Feature W Terrace:

Feature W is a slightly L- shaped terrace face measuring 5.2 m long, 0.8 m wide, and 0.6 m high. This portion of the terrace face has a long axis of 201°. Connected to the southern end of this terrace is another small alignment measuring 2.1 m long, 0.5 m wide and 0.55 m high, with a long axis of 300°. Both of the alignments are roughly 3 courses high and the entire feature is 12.7 m south-southwest of Feature Q.

Feature X Circular Depression and Terrace:

The first component of this feature is a partially stone-lined depression which is roughly 2.07 m in diameter and 0.5 m deep. This depression is located 8.7 m southeast of Feature Q. Just west of the depression is a terrace face measuring 3.25 m long, 0.75 m wide and 0.54 m high with a long axis of 206°.

Feature Y Terrace:

This feature was identified as the easternmost feature in Site 4434. It is a roughly rectangular terrace which is located in a thick bamboo grove, however, because of the dense overgrowth its true north and east boundaries could not be determined but has an area of approximately 170 m^2. The terrace platform is relatively flat and on the south

measures 17 m long, 0.4 m wide, is two courses high and has a long axis of 132°. On the west, the platform is 10 m long, 0.4 m wide and is also two courses high. This western side of the terrace sits directly atop bedrock. Additionally, there is some historic debris in the area, which includes bottles and bricks.

Feature Z Terrace:

This feature was formed by the modification of a natural outcrop. Its face is 5m long, 0.85 m wide, 0.6 m (1 to 3 courses) high and has a long axis of 58°. Feature Z is located approximately 40 m south-southeast of Feature W.

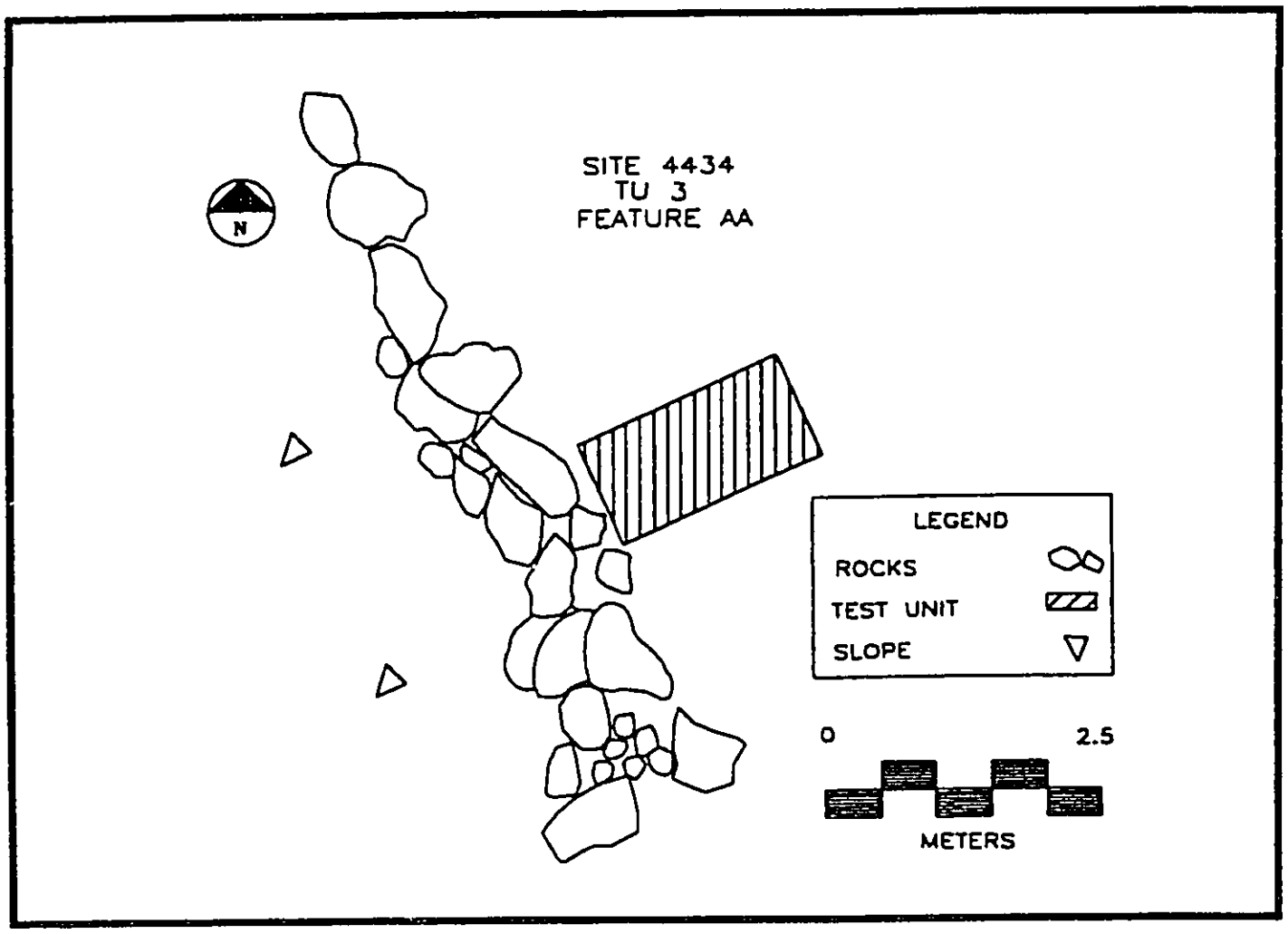

Figure 13. Feature AA of Site 4434.

Feature AA Terrace:

The face of Feature AA measures 7.1 m long, 1 m wide, 0.9 m high and has a long axis of 338°. It is located 2.6 m west of Feature I.

Feature AA is the second of two possible agricultural terraces selected for excavation. TU 3 was also a 1 x 2 m unit running up slope at a 246° bearing. Again, because the aim was to obtain strictly stratigraphic information, arbitrary levels were not observed and no removed soil was screened. Due to the shallowness of the soil deposits materials it is likely that Feature AA is post-Contact in age.

A profile of the south wall identified three stratigraphic layers (see Figure 14).

Layer I 0-21 cm bs	Very dark grayish brown (10 YR 3/2) silty clay loam with loose moist dense guava roots, few sub-angular small cobbles and pebbles; 1 charcoal fleck noted but not collected.
Layer II 21-34 cm bs	Very dark grayish brown (10 YR 3/2) compact moist clay with minimal sub-angular pebbles, intrusion of Layer I in middle portion of unit probably due to root penetration. Sterile.
Layer III 34-49 cm bs	Dark gray (10 YR 4/1) compact moist clay with numerous rock inclusions and mottled from saprolytic rock. This layer not found in west 1/4 of unit. Sterile.

Feature BB Terrace with Paved Area:

The face of this terrace has a long axis of 137° and measures 10 m long, 0.4 m wide, 0.7 m high (3 to 4 courses). At the southeastern end it has a small rectangular-shaped alignment with interior paving. The rectangular alignment measures 2.5 m long (north-south), 1.3 wide and 0.26 m high. The feature is constructed just below a natural outcrop which measures 1.5 m in height.

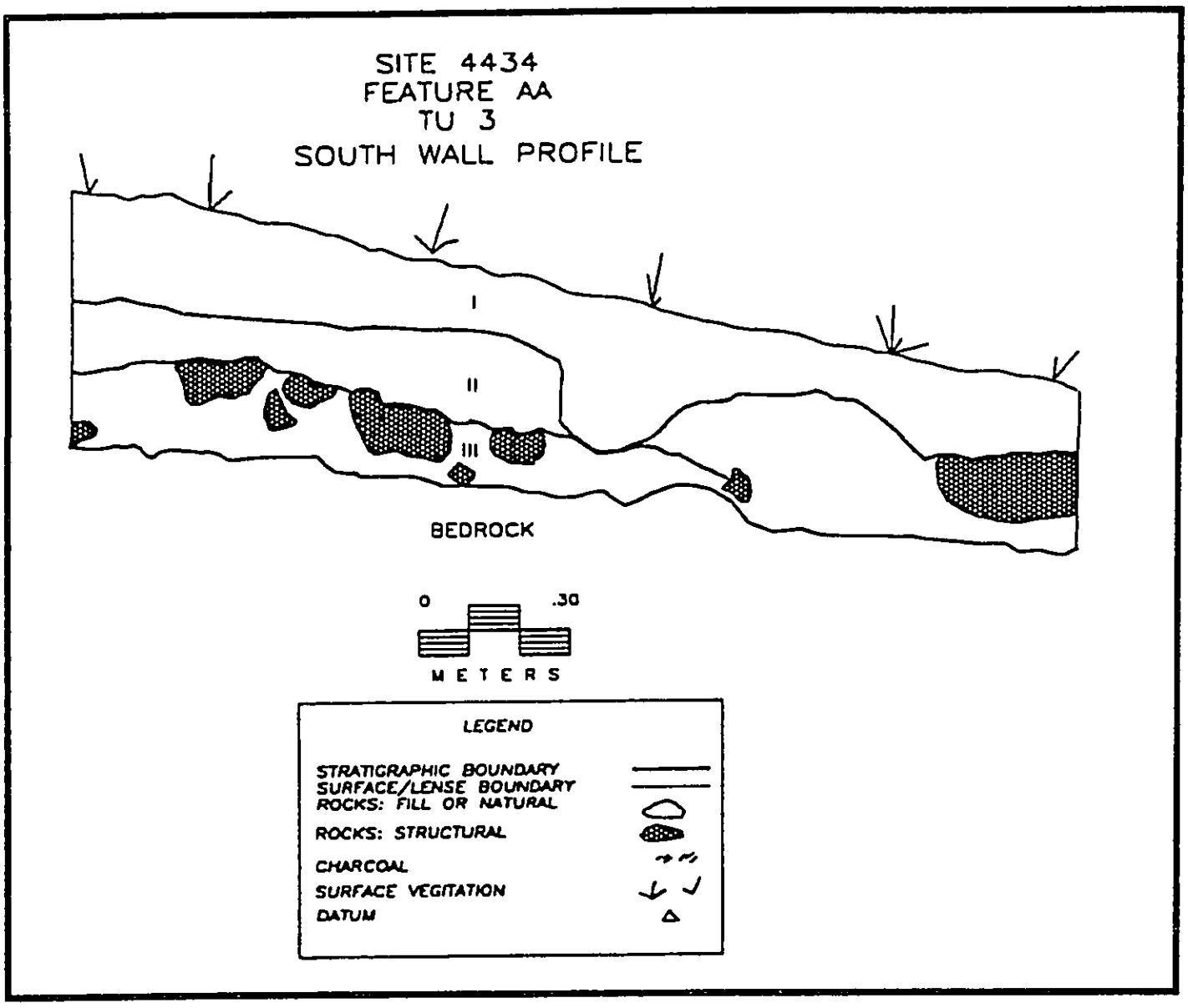

Figure 14. Stratigraphic profile of TU 3.

Feature CC Terraces:

Feature CC consists of a single straight terrace face and two slightly larger irregularly-shaped terrace faces. This feature is also associated with a somewhat large amount of historic debris, which is partially covering the northern end of the westernmost face. The easternmost face (up slope), measures 4.5 m long, 0.5 m wide, 0.35 m high and is oriented at a 197° angle. Attached to the southern end of this face is another terrace face running east (up slope) for a distance of 2.5 m. This face is 0.5 m wide, 0.43 m high and has an east-west axis of 96°.

Two meters below this terrace is a smaller, straight terrace face, which measures 3.3 m long, 0.3 m wide, 0.15 m high and is situated at a 186° bearing.

Roughly 0.5 m below this face is the largest and most irregular face of the three. The southernmost leg of this face is 4.6 m long, 1m wide, 0.5 m high and has a north-south axis of 186°. The middle leg of the face measures 2.9 m long, 1 m wide, 0.5 m high and

runs at a 293° angle to the southern leg. The northernmost leg of the face measures 2.3 m long, 1 m wide, 0.5 m high and is oriented almost due north from the previous leg. It is this leg of the face that is partially covered by historic debris which includes shoes, metal, plywood and other items.

Feature DD Terrace:

This face, located 16.5 m east of Feature CC, measures 8.4 m long, 1 m wide, 0.65 m high (2 to 4 courses) and although quite bowed, has a long axis of 202°

Feature EE Terrace:

Located 25.7 m south (202°) of Feature CC, this terrace face measures 18.75 m long, 0.75 m wide, 0.5 m high (1 to 2 courses) and has an east-west axis of 296°. The earthen surfaces both above and below this terrace are quite level and the western end of the terrace continues almost until it hits a dry stream bed (Kanaha Stream) which runs north-south along the project area's westernmost boundary.

Feature LL Terrace:

This feature is the northernmost terrace in the series of four terraces (Features D, F, L, and LL), placed end to end and oriented along a similar axis. Situated 4.2 m north of Feature L, the face of this terrace measures 2 m long, 1 m wide, 0.75 m high and has a long axis of 3°.

SITE 50-80-14-4443

Site 4443, containing only two features, is bordered on the south by a man-made drainage feature which runs from the extreme eastern to the extreme western boundary of project area, then continues on to Kanaha Stream (Figure 6). This drainage measures 76 m long by 1.5 m wide but because of its considerably deteriorated condition its true width was difficult to discern. The terrain of Site 4443 is mostly steep and rough mountainous land however, Kaena very stony clay may be present near the stream bed as well. The elevation of Site 4443 ranges from approximately 86 to 95 m (280 to 310 ft). Vegetation observed within Site 4443 includes guava (*Psidium sp.*), silver oak (*Grevillea robusta*), monkeypod (*Samanea saman*), *lehua* haole (*Calliandra inaequilatera*), and koa haole (*Leucaena leucophala*) trees, as well as morning glory (*Ipomoea congesta*) and white shrimp (*Justicia betonica*).

The overall condition of the site is poor and though no test excavations were carried out here, the presence of large quantities of 20th century A.D. debris indicates that these two terraces served as minor agricultural features associated with modern (A.D. 1900 - A.D. 1950) occupation.

Feature A Terraces:

This feature consists of two rather poorly constructed terrace faces, one above the other, located roughly 45 m southeast (138°) of Feature EE. While both terraces abut the drainage on the south, the lower terrace is an L-shaped (opening to the west) alignment

with the higher terrace being a straight alignment almost parallel to the longest portion of the one below. The longest portion of the L-shaped terrace face measures 7.7 m long, 0.45 m wide, 0.6 m high and has a north-south axis of 6°. The bottom of the L-shape measures 2.6 m long, 0.45 m wide, 0.25 m high and has an east-west axis of 258°. The second terrace face in this feature is 2.5 m east (up slope) of the lower one. It measures 6.3 m long 0.3 m wide, 0.2 m high and has a north-south axis of 356°.

Feature B Terrace:

This terrace, though partially collapsed, appears to be an extension of an outcrop situated at its eastern end. Its face measures 5.5 m long, 1 m wide 1.1 m high (2 to 4 courses) and has an east-west axis of 284°. The terrace is well-faced in some places and the ground behind (east) it is quite level.

SITE 50-80-14-4444

Site 4444 consists of only one feature, located on the stream flat located down slope of the northwest corner of Lot 2 (see Figures 5 and 6). The major soil type found within Site 4444 is rough and steep mountainous land, with elevations between 55 and 64 m (180 and 210 ft). Vegetation observed includes guava (*Psidium sp.*), 'opiuma (*Pithecolobium dulce*), koa haole (*Leucaena leucophala*), surinam cherry (*E. uniflora*), lehua haole (*Calliandra inaequilatera*), lemon (*Citrus limon*) and monkeypod (*Samanea saman*) trees, as well as bougainvillea (*Bougainvillea spectabilis*), and morning glory (*Ipomoea congesta*).

The types of debris found at Site 4444 suggests that the site was associated with residential activity. The site is in good condition. No test excavations were carried out here however, an extensive amount of 20th century A.D. debris, including a large accumulation of broken bottles suggests mid to late 20th century A.D. utilization of the area.

Feature A Paving with Alignment:

The main component of this feature is an oval-shaped paved area measuring roughly 5 m long by 3 m wide. The area is paved with fist-sized and smaller sub-angular and sub-rounded cobbles. The alignment, which abuts the southwest side of the paved area, measures 10.6 m long, 0.3 m wide, 0.26 m high and has a long axis of 310°.

SITE 50-80-14-4445

Feature A Modern Dump:

This feature is a large collection of modern debris which has a rough diameter of 20 m by 30 m (see Figure 6). Debris scattered in the area includes cars, both whole and partial, other automotive debris, washers, dryers, bed frames, bottles, tin, metal, wood, ceramics and other household items. Due to the high concentration of debris, Site 4445 most likely served as a dumping area for modern debris.

The terrain of Site 4445 is a combination of steep and rough mountainous land with Kaena stony clay located on the down slope side. Site 4445 varies in elevation between 74 and 89 m (240 and 290 ft). Vegetation observed in the area includes guava (*Psidium sp.*), *lehua* haole (*Calliandra inaequilatera*), and monkeypod (*Samanea saman*) trees, as well as morning glory (*Ipomoea congesta*), banana poka (*Passiflora mollissina*) and bermuda grass (*Cynodon dactylon*).

SITE 50-80-14-4446

This site, also consisting of only one feature, is located 27.7 m almost due south (182°) of Feature EE of Site 4434 (see Figure 6). Site 4446 is at approximately the 74 to 86 m (240 to 280 ft) elevation. Vegetation observed in the area includes guava (*Psidium sp.*), *lehua* haole (*Calliandra inaequilatera*), surinam cherry (*E. uniflora*) and koa haole (*Leucaena leucophala*) trees. Due to the incorporation of cinder blocks into the terrace faces of Site 4446, the feature is most likely of modern age and served as a retaining terrace used to sculpt the steep slopes of the area for agricultural use.

Feature A Terrace:

This feature is a stone-faced terrace measuring 5.1 m long, 0.6 m wide, 0.55 m high (2 to 3 courses) and has a long axis of 10°. Behind the terrace face, which has cement blocks built into it, the ground is level. Just below and to the south of this terrace is a small alignment, measuring 3 m long, 0.5 m wide, and 0.55 m high, with a long axis of 16°.

SUMMARY

In the background research section, land use in the upland portion of Kalawahine during the A.D. 1800's was extremely limited, only the possibility of some minor dry-land cultivation is indicated. The lack of commoner Land Commission Awards in upland Kalawahine, and information gleaned from 19th century A.D. survey maps, indicate that areas of habitation and cultivation in Honolulu *ahupua'a* were concentrated in better watered regions such as Nu'uanu Valley or around Honolulu Harbor. The evidence further documents that as the city of Honolulu grew, expansion into the Makiki and Pauoa Valleys, and the Tantalus uplands occurred during the early A.D. 1900's, expansion which eventually lead to the settlement of upland Kalawahine. Archival documents and survey maps indicate that by A.D. 1920, the project area contained some 30 families, who permanently resided there and were engaged in small scale agriculture.

Archaeological survey of upland Kalawahine revealed no evidence of A.D. 1800's or pre-Contact settlement or cultivation of the area. No traditional or 19th century A.D. artifacts were identified in the project area; all surface material collected and Site 4434 excavated material was 20th century A.D. refuse. Most of the archaeological features identified during survey were found to contain medium to high quantities of 20th century

A.D. artifacts and debris, many of them incorporating pieces of corrugated tin and broken glass within their stone work. Furthermore, test excavations within Site 4434 showed convincingly that residences and cultivation terraces dated after A.D. 1900, with no earlier structures or deposits. This corroborates the picture of A.D. 1900-1950 occupation and of very limited or no habitation of the area prior to A.D. 1900. It also expands the AD. 1800's pattern back to pre-Contact times.

In terms of the A.D. 1900-1950 archaeological features, few house platforms or residential sites were identified. The majority of identified features are terraces, presumably utilized to sculpt the steep slopes in the area for small and narrow agriculture areas. Excavations of three possible agricultural terraces in Site 4434 reveal that these terraces contained relatively poor soils and high amounts of clay. The general low density of house lots in the project area, in contrast to the particularly high density of people known to have resided there between A.D. 1900-1950, appears to be the result of Board of Water Supply bulldozing in the project area circa A.D. 1950. This would account for the lack of house foundations as well as the fragmented bits of debris located throughout the project area. This would also explain why most of the archaeological features identified during survey do not match the 1935 survey map of known residences and architectural features.

Archaeological evidence as well as limited oral historical work indicate that there are no known pre-Contact or modern burials within the project area. Residents circa A.D. 1930-1950 appear to have been buried in nearby cemeteries such as the Makiki Cemetery, according to limited oral history. Except for those burials thought to be in Lot 3, there is no indication from current residents that additional graves are present.

REFERENCES CITED

Alexander, W. D.
1873 *Map of Makiki Valley and Lands Adjacent; Makiki and Kewalo.* Map 1071, State of Hawaii Survey Office.

Armstrong, R. Warick (editor)
1983 [1973] *Atlas of Hawaii.* 2nd ed. University of Hawaii Press, Honolulu.

Boundary Commission Books
1864-1882 Boundary Commission, Book 1, pp. 223-225, O'ahu. Microfilm, State of Hawaii Archives.

Bailey, Charles T.
1935 *The Hawaiian Home Lands of 'Auwaiolimu, Kewalo and Kalawahine.* Hawaii Territory Survey Map C.S. 83, State of Hawaii Survey Office.

Board of Water Supply
1935 *Survey of Kalawahine Squatters.* Interior Department, Honolulu, HI.

Daws, Gavin
1966 *Honolulu--The First Century Influences in the Development of the Town to 1876.* Unpublished Ph.D. dissertation, University of Hawaii.

Dodge, F. S., and Walter E. Wall
1893 *Kamanuwai Block, and a Part of Kamakele.* Map 1751, State of Hawaii Survey Office.

Dove, Chas V. E.
1912 *Map of Honolulu, Hawaiian Islands.* Map CS 18-80, State of Hawaii Survey Office.

Emerson, J. S.
1883 *Iwilei Section of Honolulu.* Map 998, State of Hawaii Survey Office.

Fitzpatrick, Stephanie
1989 *Makiki's People and Land in Mid-Nineteenth Century Hawai'i.* Unpublished M.A. dissertation, University of Hawai'i.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens
1972 *Soil Survey of Islands of Kauai, O'ahu, Maui, Molokai, and Lanai, State of Hawaii.* U.S. Department of Agriculture, Washington, DC.

Fornander, Abraham
1974 [1919] *Fornander Collection of Hawaiian Antiquities and Folk-Lore*, vol. Volume V, Part II. Kraus Reprint Co., Millwood, NY.

'I'i, John Papa
1963 [1959] *Fragments of Hawaiian History*. Bishop Museum Press, Honolulu.

Indices of Awards
1929 *Indices of Awards made by The Board of Commissioners to Quiet Land Titles in the Hawaiian Islands*. Office of the Commissioner of Public Lands of the Territory of Hawaii, Honolulu.

Kamakau, Samuel M.
1961 *Ruling Chiefs of Hawaii*. Kamehameha Schools Press, Honolulu.

Libre (Bureau of Conveyance Records)
1872 Agreement between A.A. Haalelea and J.H. Coney to have Coney manage Haalelea's properties on Oahu, July 31, 1872. *Regular System Reference Book 36*:33, Bureau of Conveyances, Honolulu, HI.
1875 Original Deed of A.A. Haalelea to J.H. Coney; "The Ili 'aina of Kalawahine", October 16, 1875. *Regular System Reference Book* 44:52, Bureau of Conveyances, Honolulu, HI.
1907a Original Deed "W.M. Giffard and Wife to Territory of Hawaii," *Regular System Reference Book* 291, Bureau of Conveyances, Honolulu, HI.
1907b Original Deed of Laura A. Coney, et al to William Giffard; "The Aina of Kalawahine", January 18, 1907. *Regular System Reference Book* 287, Bureau of Conveyances, Honolulu, HI.

Lind, Andrew
1980 *Hawaii's People*. 4th ed. The University Press of Hawaii, Honolulu.

Macdonald, Gordon A., Agatin T. Abbott, and Frank L. Peterson
1983 [1970] *Volcanoes in the Sea the Geology of Hawaii*. University of Hawaii Press, Honolulu.

McAllister, J. Gilbert
1971 [1933] *Archaeology of Oahu*. Kraus Reprint Co., Millwood, NY, Bernice P. Bishop Museum Bulletin 104.

Monsarrat, M. D.
1897 *Honolulu, Hawaiian Islands*. Map 1910, State of Hawaii Survey Office.
1901 *Map of Honolulu, Hawaiian Islands*. Map CS 18-80, State of Hawaii Survey Office.
1920 *Honolulu, Territory of Hawaii*. Map P. 1, F2, #26, State of Hawaii Survey Office.

Native Register
1850-1855 Board of Commissioners to Quiet Land Titles: *Native Register* Vols. 2,3,4 and 5. State of Hawaii Archives.

Native Testimony
1850-1855 Board of Commissioners to Quiet Land Titles: *Native Testimony* Vols. 2 and 10. State of Hawaii Archives.

Public Law
1934a "A Bill to Amend Sections 203 and 207, Hawaiian Homes Commission Act". *Congressional Record - House* 78 (Part 8):8223-8224, Public Law 34-227.
1934b U.S. House of Representatives. 73rd Congress, 2nd Session. Report on H.R. Bill 8052 (House Report 1190). Washington: Government Printing Office, 1934. (*Serial Set 9775*), Public Law 34-227.
1937 "To Amend the Hawaiian Homes Act, 1920" (PL # 200, 9 July 1937), *United States Statutes at Large 75*, pp. 497-507.
1951a "A Bill to withdraw and restore to its previous status under the control of the Territory of Hawaii certain Hawaiian homelands required for the use of the Board of Water Supply of the City and County of Honolulu for the location of a water shaft, pump station, and tunnel, and to amend section 203 of the Hawaiian Homes Commission Act, 1920, so as to confer upon certain lands of 'Auwaiolimu, Kewalo-Uka, and Kalawahine, on the island of Oahu, Territory of Hawaii, the status of Hawaiian homelands.". *Congressional Record - House* 97(Part 10):12616-12617, Public Law 52-481.
1951b U.S. House of Representatives. 82nd Congress, 2nd Session. Report on H.R. Bill 4197 (House Report 1052). Washington: Government Printing Office, 1951. (*Serial Set* 11498).
1990 Committee on Housing and Hawaiian Programs, *Standing Committee Report No. 3067*. Honolulu, HI.

Pukui, Mary Kawena, Samuel H. Elbert, and Esther T. Mookini
1986 [1974] *Place Names of Hawaii*. Revised and enlarged ed. The University Press of Hawaii, Honolulu.

Realty Atlas
1990 *State of Hawaii First Tax Division, City and County of Honolulu, Map Volume Zone 1.* 24th ed. REDI Real Estate Information Service, Ft. Lauderdale.

Stearns, H. T., and K. N. Vaksvik
1935 *Geology And Ground-Water Resources of the Island of O'ahu, Hawaii.* Territory of Hawaii, U.S. Geological Survey, Wailuku.

U.S. Geological Survey
1983 *Honolulu Quadrangle, O'ahu Island, Hawaii.* United States Geological Survey, 7.5 Series, Quad 14.

Wall, Walter E.
1893 *Nu'uanu and Vineyard North*. Map 1715, State of Hawaii Survey Office.
1922 *Kalawahine Slopes*. Hawaii Territory Survey Map 2055, State of Hawaii Survey Office.

Yent, Martha, and Jason Ota
1980 Archaeological Field Survey of Makiki Valley, the Kanaelole Stream and Moleka Stream Systems, Makiki, Kona, Oahu Review Copy. State Historic Preservation Division, Honolulu, HI.

D-1. State Historic Preservation Division Letter

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BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

June 13, 1997

MEMORANDUM

LOG NO: 19635
DOC NO: 9706RC15

TO: Darrell Yagodich, Planning Office
Department of Hawaiian Home Lands

FROM: Don Hibbard, Administrator, State Historic Preservation Division
Department of Land & Natural Resources

SUBJECT: Accelerated Developments of DHHL -- O'ahu High Priority Area at
Kalawahine 'Ili
Honolulu, Kona, O'ahu
TMK: 2-4-34: 8, por. 22

These two parcels lie within the ravine formed by the intermittent Kanaha stream, located behind Roosevelt High School. This ravine forms a large portion of the upland piece of the former 'ili (land unit) of Kalawahine, an 'ili within Honolulu ahupua'a. The 'ili had two other pieces -- one on the shore at Iwilei and one approximately in the Foster Botanical Garden area.

In 1993 our archaeological survey team working on DHHL lands surveyed most of the Kanaha ravine. The report (Kolb, Mitchell, Conte, McFadden 1993. Archaeological Inventory Survey in Kalawahine 'Ili, Honolulu Ahupua'a, Kona District, Island of O'ahu. SHPD ms, in SHPD Library.) summarized both archival and archaeological findings. Some oral historical work was also done. Pertinent findings are as follows:

1. Precontact to 1850s. Archival records from the early 1800s (1800s-1850s) indicate that Honolulu's permanent housing and major farming lands (kalo lo'i) were on the shore and up the permanent streams in Nu'uanu valley and Pauoa valley. Twenty-five commoner Land Commission Awards (LCA) were awarded in Kalawahine 'ili. All were clustered in the Foster Gardens area, and they included houselots, irrigated kalo fields, and some dryland farm plots (kula). The Iwilei piece included fishponds and fishing rights. No claims were made for parcels within the mauka Kalawahine piece where your project area is located. This area may have been forest land. This 1850s pattern is likely to approximate the precontact pattern, with fewer people living on the shore (as Honolulu was not then a capital or royal center). Archaeological findings support this pattern for mauka Kalawahine. No heiau were recorded in

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this area in the 1930s by the Bishop Museum. Our office's survey found no precontact sites in the project area.

2. 1870s-1900. Archival records show land sale activities focused in the coastal pieces, where all the housing, kalo fields, fishponds and fishing rights had existed. An 1873 survey of the mauka Kalawahine piece by C.T. Lyons states: "I didn't hear formerly that ... Kalawahine had any kula [dryland fields], that they were mountain lands" (Boundary Commission 1:225). This suggests that the mauka piece was forest land, including the forest resources for the 'ili. Maps of the 1870s show that Honolulu's growing settlement had not yet expanded into the valleys behind Punchbowl; all roads end at the makai side of Punchbowl. By 1900, the city still was only makai of Punchbowl and in the Makiki/Punahou area at the base of Round Top. There are still no records of anyone settling in the mauka section of Kalawahine. It is possible that ca. 1900 nearby small settlements may have begun to use these valleys for small scale agriculture, but no records have been found supporting this possibility. Our archaeological survey found no archaeological sites dating to this period, tending to support the idea that this had been forest land.

3. 1900-1950. Archival records show that "squatters" had been living in mauka Kalawahine since about 1911. There seem to have been 30 or more different families living in the area. By 1935 there may have been ca. 240 people in the area. They had houses and small garden areas. In 1950, it appears that these people were forcibly relocated, and bulldozers were used to clear the area of structures, trash, etc. Our archaeological survey found 5 archaeological sites in the project area, all dating to this time period. These included small garden features, a few housing features, and considerable 20th Century artifacts and debris.

Given the fact that these two parcels (parcel 8 and portion of 22) are immediately adjacent to the area that our office surveyed in 1993, we believe that the above archival and archaeological information is also applicable to these parcels. It is highly unlikely that pre-1900 archaeological sites were present, and if they were, bulldozing in the 1950s is likely to have destroyed any such sites. It is our opinion that archaeological inventory survey of these two parcels would not be productive. We believe that it is highly unlikely that significant historic sites are present. Any development actions in these two parcels should have "no effect" on significant historic sites.

[We would like to re-emphasize a point made in our 1993 report. Mrs. Nina Asing indicated that family burial plots were on Lot 3. We are not sure where Lot 3 is, but DHHL should keep note of this point. Informants indicated that all other residents in the 1900s were buried in the cemetery at Wilder and Pensacola Avenues, so burials should not be a factor, except those noted above for Lot 3.]

RC:jk

JOHN WAIHEE
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33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

January 31, 1992

LOG NO: 4565
DOC NO: 3345C

MEMORANDUM

TO: Ben Henderson, Planning Office, Department of Hawaiian Home Lands

FROM: Don Hibbard, Administrator
for State Historic Preservation Division

SUBJECT: Chapter 6E Historic Preservation Review -- Kallawahine Archaeological Survey
Honolulu, Kona, Oahu
TMK: 7-4-34: por. 8

Our archaeological survey team under DHHL contract concluded the archaeological inventory survey of this area in November 1991. The report is almost complete and will be submitted within the month.

No significant historic sites were found in the project area. All remains proved to be modern era (1930s-1940s) house and agricultural ruins.

Thus, any use of this project area will have "no effect" on significant historic sites.

If you have any questions, please feel free to contact Dr. Michael Kolb (587-0002), the project director for these DHHL surveys.

RC:jle

D-2. Letter Related to Burials at Kalawahine Streamside

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Pacific Legacy

cultural resources consultants

Incorporated

12 March 19998

Yukie Y Ohashi
Environmental Planner
PBR Hawaii
Pacific Tower, Suite 650
1001 Bishop Street
Honolulu, HI 96813

Re: Reported Burials in the Kalawahine Project Area

Dear Ms. Ohashi:

As we have discussed previously there have been two reports of human burials or graves within the Kalawahine project area. These are:

1) The previous archaeological inventory survey by Kolb et al in 1993 documented oral testimony that graves were present in "Lot 3". The 1993 archaeological fieldwork failed to confirm the presence of these graves.

2) In February 1998, Mr. Bob Stender, who grew up in the area, informed Stan Duncan and me that when he was about 10 years old he saw what he thought were graves in the steep area on the SE side of the project area. Mr. Stender provided us with copies of a 1935 Hawaiian Homelands map of the area. The possible graves were located below the houses belonging to Samuel Maui and Sam Naaleliha.

During the current (February 1998) archaeological field investigations, the approximate area of Lot 3 was searched for possible graves. None were found. However, vegetation is quite thick in the area and if grave markers are low mounds, they could easily be missed.

The possible graves that Mr. Stender reported were probably located in the large exclusion area located on the SE side of the project area.

In summary, there appears to be very little likelihood that there are any graves within the project area. However, there is always the possibility that human skeletal material may be inadvertently discovered during the course of land altering activities. If human skeletal remains are encountered, construction activity in the immediate area of the find should be suspended and the State Historic Preservation Division should be contacted (587-0047).

If you have any questions or need clarification of any of the above, please do not hesitate to contact me.

Sincerely,

Paul L. Cleghorn, Ph.D.
Senior Archaeologist

332 Uluniu Street Kailua, Hawai'i 96734 Telephone 808-263-4300 Fax 808-263-4300 E-mail legacypc@aloha.net

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END

CERTIFICATION

I HEREBY CERTIFY THAT THE MICROPHOTOGRAPH APPEARING IN THIS REEL OF FILM ARE TRUE COPIES OF THE ORIGINAL DOCUMENTS.

2004
DATE

Tammy Yoshimura
SIGNATURE OF OPERATOR

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