Auloa Road 16 Inch Water Main

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 5, 1998

'98 MAY 27 P2:30

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

Dear Mr. Gill:

Subject: Finding of No Significant Impact for the Board of Water Supply's Proposed Auloa Road 16-Inch Water Main, Maunawili, Oahu, TMK: 4-2-014

The Board of Water Supply has reviewed the comments received during the public comment period which began on February 23, 1998. We have determined that the environmental impacts of this project have been adequately addressed as discussed in the final *environmental* assessment (EA) and are therefore, issuing a finding of no significant impact. We request that our proposed project be published as finding of no significant impact in the next Office of Environmental Quality Control (OEQC) Bulletin.

Attached are the completed OEQC bulletin publication form and four (4) copies of the final EA for your review.

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

Very truly yours,

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

Attachments

cc: Brian Takeda, R.M. Towill Corporation

46

1998-06-08-OA-FEA- Auloa Road
16-Inch Watermain

Prepared in accordance with Chapter 343, Hawaii Revised Statutes

Final Environmental Assessment

AULOA ROAD 16-INCH WATER MAIN

Maunawili, Oahu, Hawaii

May 1998

Proposing Agency:
City and County of Honolulu
BOARD OF WATER SUPPLY
630 Beretania Street
Honolulu, Hawaii 96843

RMTC
R. M. TOWILL CORPORATION
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii • 96817-4941
Voice: (808) 842-1133
Facsimile: (808) 842-1937

Final Environmental Assessment
AULOA ROAD 16-INCH WATER MAIN
Castle Junction to Auloa Road
Maunawili, Oahu, Hawaii

May 1998

PROPOSING AGENCY:
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

PREPARED BY:
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

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APPENDIX

PROJECT SUMMARY

Project:	AULOA ROAD 16-INCH WATER MAIN
Applicant:	BOARD OF WATER SUPPLY City and County of Honolulu 630 South Beretania Street Honolulu, Hawaii 96843
Accepting Authority:	BOARD OF WATER SUPPLY
Location:	As shown on map of TMK: 4-2-14. Castle Junction to Auloa Road, Maunawili, Oahu
Project Size:	16-inch water main x 4,100 linear feet within Auloa Road right-of-way
Land Owner:	Department of Transportation Services, City and County of Honolulu
EA Preparer:	R. M. Towill Corporation 420 Waiakamilo Road, Suite 411 Honolulu, Hawaii 96817-4941 (808) 842-1133
Existing Land Uses:	Project site is undeveloped and primarily serves as road right-of-way. Hawaii Loa College is to the north, Pali Golf Course is to the southwest, Castle Hospital is to the southeast, and residential single family dwellings are to the east.
Flood Insurance Rate Map Zone:	Zone D
State Land Use District:	Conservation District, General Subzone and Agriculture District
County Zoning:	P-1, Restricted Preservation District AG-2, General Agriculture District

Chapter 1
EXECUTIVE SUMMARY

1.1 PROPOSING AGENCY AND ACTION

The Board of Water Supply (BWS), City and County of Honolulu, proposes to install a 16-inch water main within the Auloa Road right-of-way, in Maunawili, Oahu. The project site begins from the area of Castle Junction (intersection of Kalanianaole Highway, Kamehameha Highway, and Pali Highway) and continues east along Auloa Road for a distance of 4,100 linear feet (**Figure 1-1** and **Figure 1-2**).

The proposed project is part of a major planned network to convey water from future potable sources in the windward region of Oahu. The work proposed involves replacement of an aging 12-inch main with a new 16-inch main. The new main will ensure reliability of existing water service and increase the transmission capacity in the Windward system.

1.2 PURPOSE OF ENVIRONMENTAL ASSESSMENT

City and County of Honolulu funds will be used for development. This project, therefore, is subject to preparation of environmental documentation per requirements of Chapter 200, Title 11, Hawaii Administrative Rules (HAR), and Chapter 343, Hawaii Revised Statutes (HRS). This EA will address the limited environmental impacts anticipated for development of the proposed project.

This Final Environmental Assessment and accompanying Finding of No Significant Impact (FONSI) will be filed by BWS as part of the requirements for processing of EAs.

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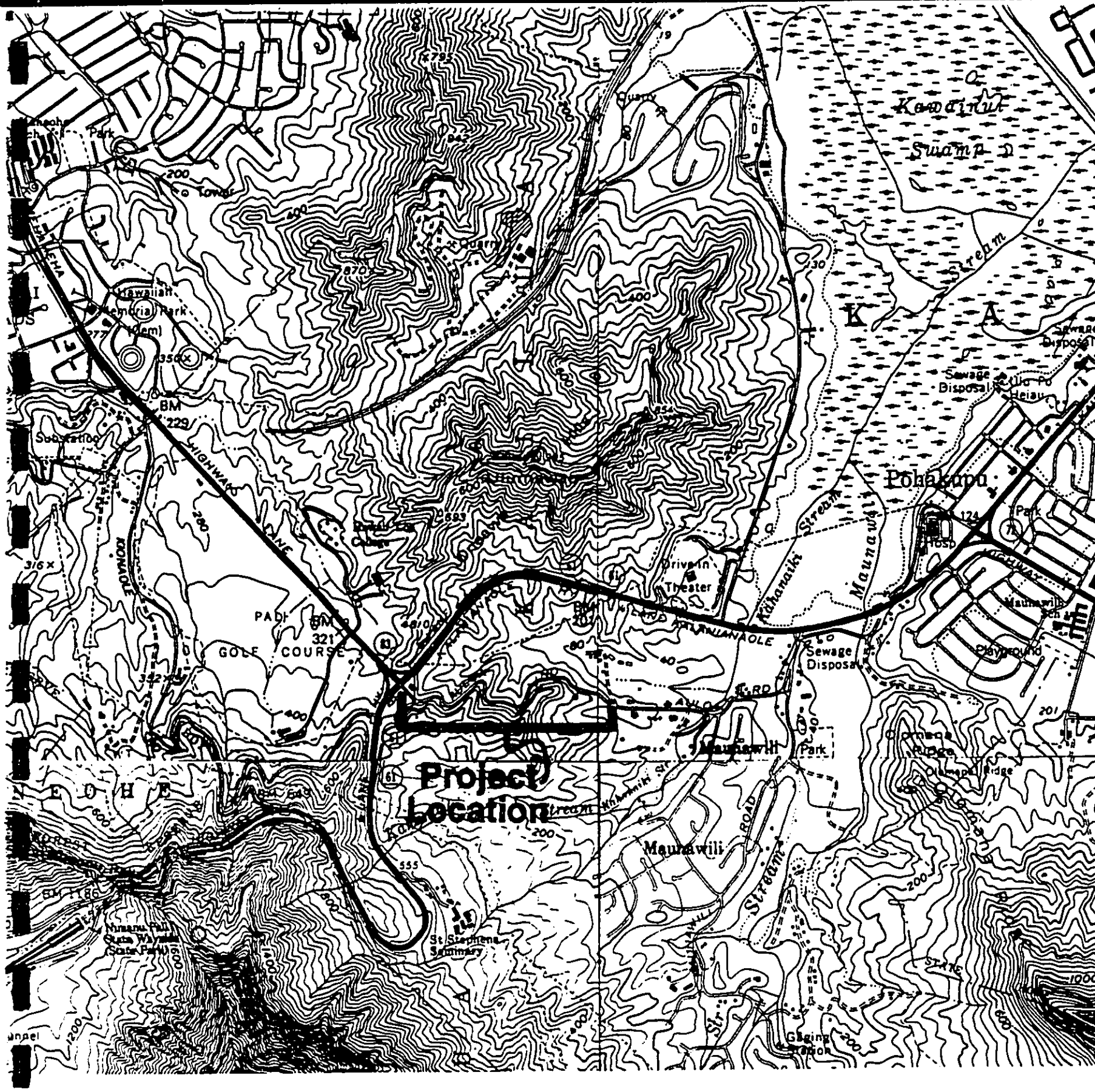

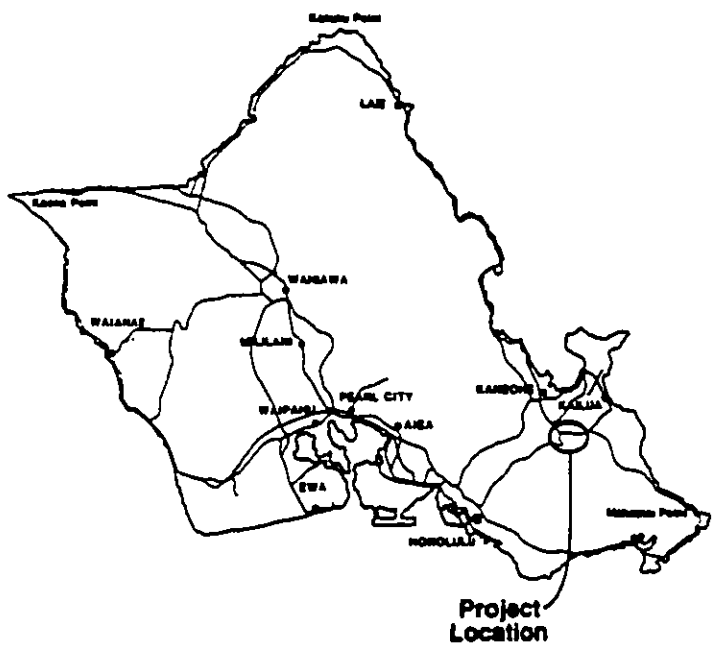

Figure 1-1
PROJECT LOCATION

0 1000 2000 4000
FEET

Board of Water Supply
AULOA ROAD 16-INCH MAIN
City and County of Honolulu

R. M. TOWILL CORPORATION
Sept 1997

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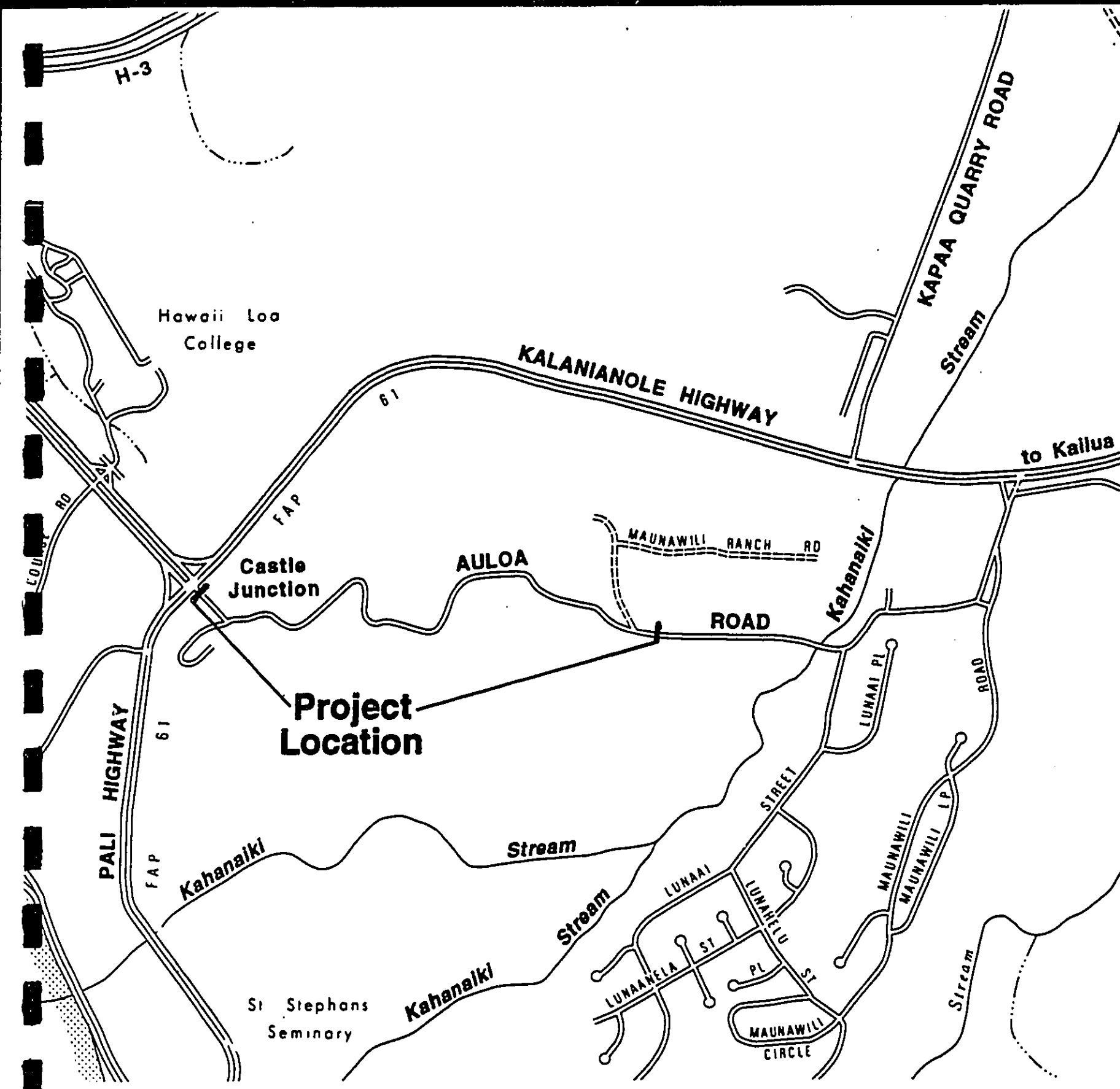

Figure 1-2
PROJECT SITE

Board of Water Supply
AULOA ROAD 16-INCH MAIN
City and County of Honolulu

R. M. TOWILL CORPORATION
Sept 1997

1.3 PERMITS REQUIRED

A Conservation District Use Permit will be required for portions of the project located within the State Conservation District, General Subzone.

National Pollutant Discharge Elimination System (NPDES) permits may be required. These permits will involve treatment and mitigation of potential impacts in the event that: 1) groundwater is "dewatered" from construction trenches; and, 2) hydrotesting effluent is discharged from the completed waterline during hydrostatic testing and disinfection. The following *general* permits must be filed separately:

- NPDES Notice of Intent (NOI) Form G - Discharges Associated with Construction Activity Dewatering (At this time groundwater is not expected to be encountered. However, should dewatering of groundwater be required, the construction contractor will file this permit); and,

- NPDES NOI Form F - Discharges Associated with Hydrotesting Waters.

The above permits address discharges to waters of the State of Hawaii classified as Class A open coastal waters (Kailua Bay) and Class II inland waters such as Kahanaiki Stream. Should any discharges be directed to Class AA waters of Kaneohe Bay or Class I inland waters an NPDES Individual Permit would be required. Under Chapter 11-55, HAR, both activities may be filed under a single NPDES *Individual* Permit.

The following permits will be required by the Department of Public Works and Department of Waste Water Management, City and County of Honolulu. These permits address discharges of construction dewatering and hydrotesting effluent to the City's stormwater sewer system:

- Construction Dewatering Permit to Discharge Groundwater into Municipal Separate Storm Sewer System; and,

- Permit to Discharge Effluent into the Municipal Storm Sewer System.

The State Department of Health (DOH), Noise and Radiation Branch, will require filing of a Noise Permit during construction and installation of the water main.

The State DOT will require a review of construction drawings and a request for right-of-entry for portions of the proposed project that lie within the State highway right-of-way.

The Department of Transportation Services, City and County of Honolulu, will require a right-of-entry for construction.

1.4 PROJECT BENEFITS

Project benefits will accrue to residents and commercial end users as well as users within the Honolulu area:

- The project will serve to increase the assimilation of existing and future potable wells within the BWS Windward Water Distribution System. The 16 inch main will provide greater backup reliability and sufficiency of flow;

- The project will replace an existing 12-inch main that is aging and in need of replacement. Construction of a new 16-inch main will increase reliability of BWS service to windward residents, businesses and organizations requiring potable water and will increase the transmission capacity within the Windward 500' system; and,

- The project will provide unused potable capacity to Honolulu which would help to partially relieve current demands on withdrawals from the Pearl

Harbor Aquifer. This would increase the efficiency of allocating Oahu's increasingly recognized finite water resources.

1.5 ALTERNATIVES CONSIDERED

This environmental assessment discusses consideration of the no action, delayed action; use of the existing site, and site alternatives for the proposed alignment.

1.5.1 No Action

The no action alternative was not considered a viable option because it does not fulfill the BWS mandate to ensure provision of potable water resources for the City and County of Honolulu. The no action alterative would also mean continued reliance on an existing and aging 12-inch water main.

1.5.2 Delayed Action

The delayed action alternative was also considered but was unacceptable because any benefits realized from delaying the action would be immediately lost in the event of a water main break. In addition, any economic benefits could similarly be lost by increased construction costs due to inflation.

1.5.3 Use of Existing Site

The site of the existing 12-inch water main is on relatively undeveloped land that has become heavily overgrown by vegetation. Potential adverse impacts associated with clearing could include loss or destruction of habitat for rare or endangered native flora and fauna. Construction of an access road would also be required leading to need for further clearing. Clearing and construction activities within a relatively undeveloped area could require preparation of biological studies and development of mitigation measures. These activities represent effort which would be in addition to the cost of construction. Use of

this site, therefore, would increase the potential for adverse impacts while increasing the public cost of the project. These consequences and the option of the preferred Auloa Road alignment, preclude this alternative from further consideration.

1.5.4 Alternative Sites

No alternative sites were reviewed for the proposed action. The project has been identified as part of the BWS program of infrastructure improvements. The project site, therefore, has been prioritized for installation of the 16-inch main based on regional water needs and future population growth and development.

1.6 POTENTIAL IMPACTS AND MITIGATION MEASURES

1.6.1 Land Use

No adverse impacts are expected to surrounding land uses. Disruption to residences is expected to be minimal and will last only as long as it takes to install each section of the transmission main. The contractor shall provide public access along Auloa Road at all times.

1.6.2 Topography and Soils

No significant negative impact to soils in the project area is anticipated. Construction within the roadway will involve use of appropriate fill material and restoration to preexisting conditions. Construction within areas of shoulder without pavement may temporarily disturb the soil retention values of existing vegetation and expose the soil to erosional forces. The impact of construction activities on soils will be mitigated by use of appropriate state and county regulations and guidelines governing construction and erosion control. Upon completion of construction the site will be returned, as much as practicable, to existing conditions.

1.6.3 Geology and Hydrology

The proposed project will not create substantial physiographic or geologic impacts. Installation will involve trench excavation to a depth of approximately 6 to 8 feet over most of the project and will not increase the amount of impermeable surface in the area or involve stream crossings.

Dewatering may be necessary if groundwater is encountered during construction trenching. Should dewatering be required Best Management Practices (BMPs) will be employed as part of the requirements of the National Pollutant Discharge Elimination System (NPDES) Permit to mitigate any potential for adverse impacts.

1.6..4 Natural Hazards

Flooding is not expected to affect the proposed project. During construction potential for impacts due to storm runoff will be addressed by use of erosion control measures in accordance with applicable regulations and guidelines. Following construction the water main will be buried. Fill over the water main will be properly compacted and the surface restored to preexisting conditions.

Although seismic risk is expected to be minimal the water main be installed in accordance with UBC Seismic Zone 3 standards. No further mitigation measures are required or recommended.

1.6.5 Demographics

Demand for water in Windward Oahu is projected to increase from 17.7 million gallons per day (mgd) in 1990 to 18.4 mgd in the year 2010 -- an estimated increase of about 4 percent (Wilson Okamoto & Associates, 1996). The proposed water line will assist in providing the capacity and reliability to accommodate projections for increased demand in the Windward area.

Construction of the water main will be bid by BWS to a contractor who will be responsible for the project. The contractor and construction crew members will likely be from all areas of Oahu, including some workers from within the Windward area. The size and benefits derived by the contractor and construction crew however, are expected to be insignificant when compared to the overall population of the Windward area.

1.6.6 Roadways and Traffic

Castle Junction is the first major intersection north of the Pali Tunnels and is the focal point for a number of major routes in Windward Oahu. The proposed project site is on Auloa Road which, unlike the major thoroughfares at Castle Junction, is a two lane roadway primarily serving the residential community of Maunawili.

The proposed project may result in limited traffic congestion during construction. Potential for traffic impacts, however, will be limited to the section involving the water main. Measures to minimize traffic congestion will include but not be limited, to the following:

- The contractor will schedule work activity between the hours of 8:30 a.m. to 3:00 p.m., Monday through Friday, excluding State holidays;

- As required, the contractor's heavy truck traffic will be scheduled to avoid Auloa Road during the morning and afternoon peak traffic periods; and,

- During construction, at least one through-lane will be open to traffic.

1.6.7 Visual and Recreational Resources

Construction personnel, equipment, and trenchwork will be visible along Auloa Road during construction. Equipment may include backhoes; water, equipment and cement

trucks; pipe sections; and, related appurtenances. The trench sections are expected to be ±4 feet wide with trench lengths to be determined. Appurtenances to the water main include fire hydrants visible at the surface. Any potential for visual impacts due to construction will be temporary in nature and is expected to return to preconstruction conditions within approximately 1-year following the end of construction.

Construction of the 16-inch water main is not expected to impact recreational resources in Maunawili. The proposed project when complete will have no lasting adverse visual or recreational impact to the area.

1.6.8 Archaeology

No short or long term impacts are expected. The proposed 16-inch water main is located on Auloa Road, which has been previously disturbed during construction. There are no known significant historic or archaeological features in the project area. A possible "Laotian Shrine" located in an existing banyan tree will not be adversely impacted or affected by construction. In the event that any unidentified cultural remains are uncovered during excavation, work in the immediate area will cease and the DLNR, Historic Preservation Division shall be notified at (808) 587-0047 to determine significance and treatment of any findings.

Copies of the Draft EA have been provided to the State Department of Hawaiian Home Lands and Office of Hawaiian Affairs. No significant archaeological or cultural resource comments were received from these agencies.

1.6.9 Flora and Fauna

The area surrounding Auloa Road has been heavily modified and has contributed to the apparent absence of rare, threatened and/or endangered species at the site. The road right-of-way, where the proposed water line will be installed has little to no vegetation or habitat

for fauna and therefore, is not anticipated to adversely affect the biological resources of the area.

To the extent possible, vegetation removal will be kept to a minimum. If necessary, the proposed alignment of the main will be adjusted to avoid the removal or damage to trees along the watermain route. No further mitigation is proposed or recommended.

1.6.10 Air Quality and Noise

Air quality in the Maunawili area is good due to minimal development and the almost continual presence of trade winds. The primary source of airborne pollutants in the project area is from vehicular exhausts directly from Kalanianaole Highway, Pali Highway, Kamehameha Highway, and Auloa Road.

Although there will be temporary effects due to construction, the proposed action is not expected to significantly affect air quality. Any potential for impacts will be reduced through use of dust control measures by watering, proper vehicle maintenance, and scheduling work to avoid peak traffic periods on Auloa Road. Also, normal tradewind patterns should disperse pollutant emissions.

A temporary increase in noise levels due to construction is likely to occur to adjacent areas. Any increase in noise due to construction will cease as work is completed along the alignment. To mitigate short-term impacts, specific start and curfew times will be established for construction activities. In addition, the Contractor will be required to follow State and County regulations regarding noise control. Noise levels from construction activities are not expected to exceed allowable levels.

1.7 DETERMINATION

In accordance with Chapter 343, HRS, BWS anticipates that an EIS will not be required for construction of the 16-inch water main at Auloa Road. This determination is based on

limited project duration and because any adverse impacts that would result can be minimized to insignificant levels by applying the recommended mitigation measures.

An anticipated Finding of No Significant (FONSI) is also expected for this project due to limited potential for adverse environmental impacts.

1.8 AGENCIES AND OTHERS CONSULTED

The following agencies were contacted during preparation of this EA:

STATE OF HAWAII
Department of Land and Natural Resources (DLNR)
Historic Preservation Division
Commission on Water Resources Management (CWRM)
Department of Health (DOH)
Environmental Management Division
Office of Environmental Quality Control (OEQC)
Department of Business, Economic Development & Tourism (DBEDT)
Land Use Commission (LUC)
Department of Transportation (DOT)
Highways Division (DOT-H), Technical Review Branch

CITY AND COUNTY OF HONOLULU
Board of Water Supply (BWS)
Department of Public Works (DPW)
Department of Land Utilization (DLU)
Planning Department

The following additional organizations, agencies, and individuals were notified during the 30-day Draft EA comment period:

FEDERAL AGENCIES

U.S. Army Corps of Engineers

U.S. Department of the Interior

U.S. Fish and Wildlife Service (USF&WS)

U.S. Geological Survey

STATE AGENCIES

Department of Education (DOE)

University of Hawaii

Environmental Center

Department of Hawaiian Home Lands (DHHL)

Office of Hawaiian Affairs (OHA)

CITY AND COUNTY OF HONOLULU

Department of Transportation Services (DTS)

Building Department

Department of Park and Recreation

Fire Department

PRIVATE AND COMMUNITY ORGANIZATIONS, AND ELECTED OFFICIALS

Honolulu City Council

Kailua Neighborhood Board No. 31

State Senator Marshall Ige

State House Representative David Pendleton

Sierra Club, Hawaii Chapter

Chapter 2
PURPOSE AND DESCRIPTION OF PROPOSED ACTION

2.1 PROJECT PURPOSE

The proposed transmission project is part of a major planned network to convey water from future potable sources in Windward Oahu. An existing 12-inch transmission main in the vicinity of the proposed project is aging and in need of replacement. The aging 12-inch main also does not have sufficient capacity or reliability to permit transmission from future sources within the region. Replacement will permit BWS to increase capacity of its Windward Water Distribution System, thereby permitting the planned assimilation of future proposed wells while increasing reliability.

The increased transmission capability of the proposed project will also permit the diversion of unused potable capacity around Makapuu to Honolulu, to partially relieve demands on importing water to Honolulu from the Pearl Harbor Aquifer.

2.2 PROJECT DESCRIPTION

2.2.1 Project Location and Site Characteristics

BWS, City and County of Honolulu, proposes to install a 16-inch water main within the Auloa Road right-of-way, in Maunawili, Oahu (**Figure 2-1** and **Figure 2-2**). The project site begins from the area of Castle Junction (intersection of Kalanianaole Highway and Kamehameha Highway) and continues east along Auloa Road for a distance of 4,100 linear feet.

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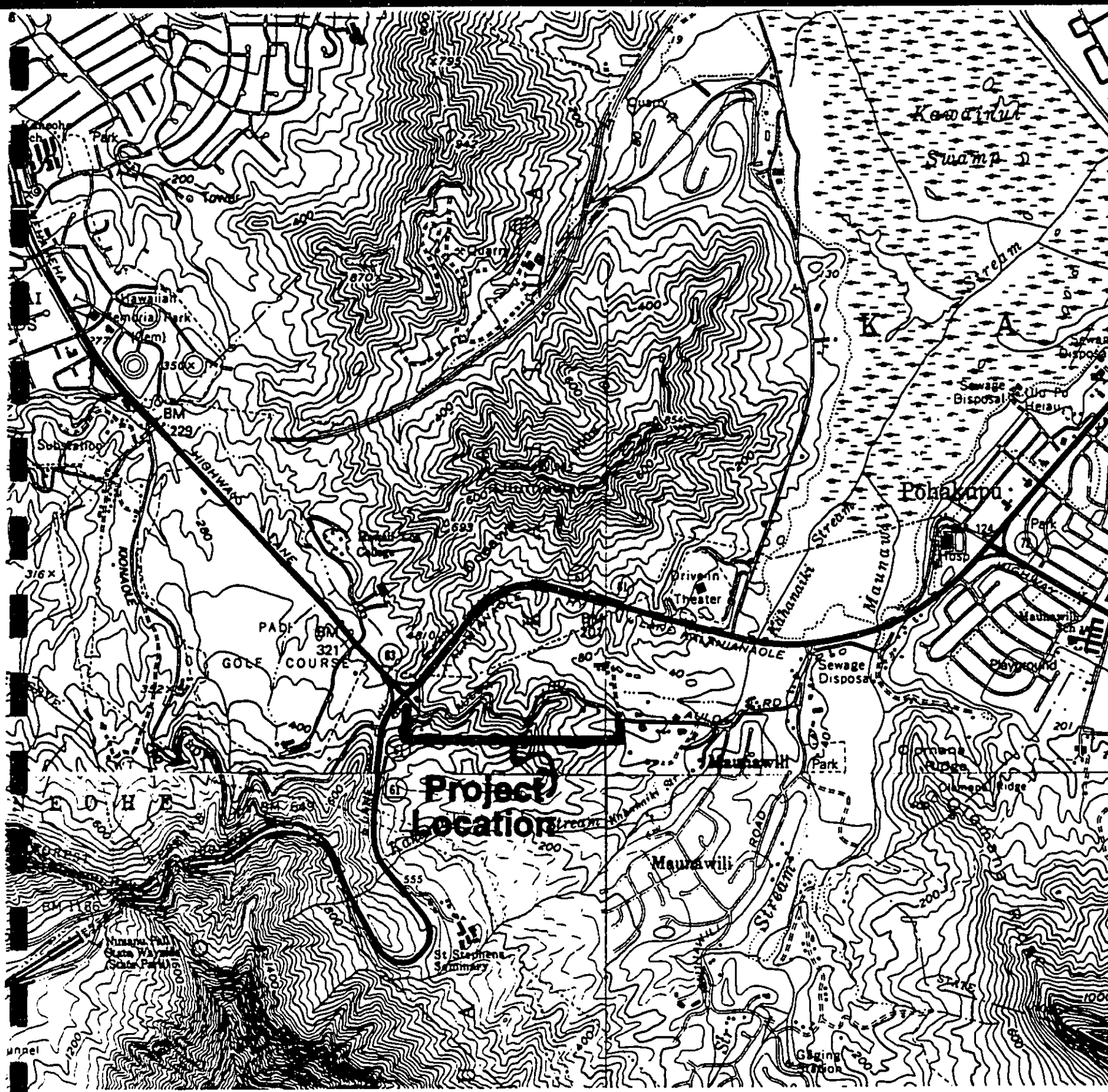

Figure 2-1
PROJECT LOCATION

0 1000 2000 4000
FEET

Board of Water Supply
AULOA ROAD 16-INCH MAIN
City and County of Honolulu

R. M. TOWILL CORPORATION
Sept 1997

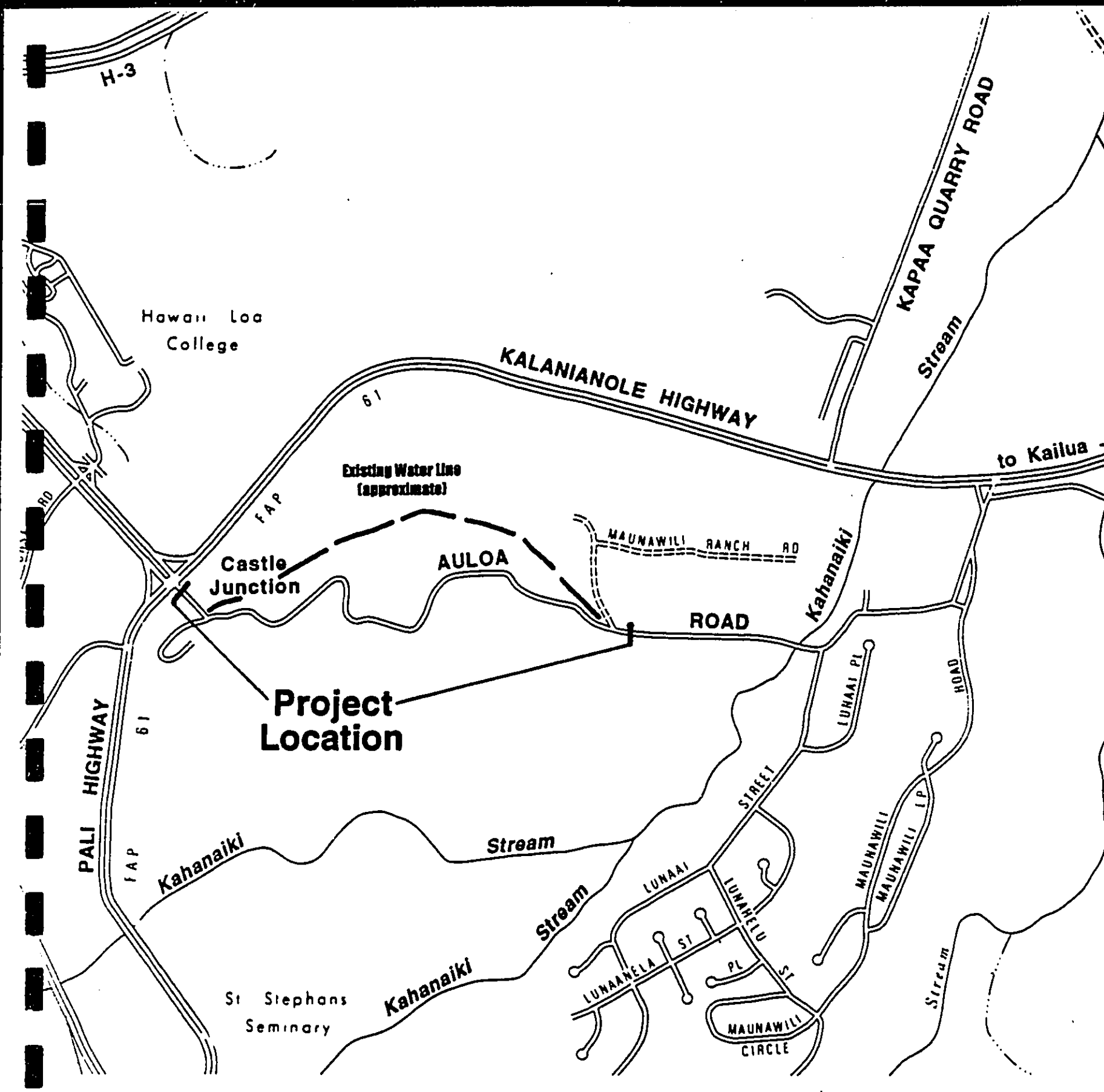

Figure 2-2
PROJECT SITE

0 1000 2000
FEET

Board of Water Supply
AULOA ROAD 16-INCH MAIN
City and County of Honolulu

R. M. TOWILL CORPORATION
Sept 1997

The proposed work will be within the Auloa Road right-of-way. Land uses surrounding the proposed work area are of relatively undeveloped parcels. Land uses further away from the site include Hawaii Loa College to the north, Pali Golf Course to the southwest, Castle Hospital to the southeast, and residential single family dwellings to the east (**Figure 2-3**). There are no single family residences in the immediate vicinity of the proposed project.

2.2.2 Technical Characteristics

The project will be implemented in several stages extending from Castle Junction eastward along the Auloa Road right-of-way. The 16-inch main will be installed on the north side of Auloa Road and will be buried with a minimum cover of three (3) feet throughout its length. **Figure 2-4** represents a typical trench cross-section. Overall construction, including mobilization of personnel and equipment, staged construction, and demobilization, is estimated at ±1-year.

The contractor will schedule work activity between the hours of 8:30 am to 3:00 pm, Monday through Friday, excluding any State holidays. At least one through-lane will be open during all periods of construction. Trenches shall be covered during non-working hours with safe, non-skid bridging material to accommodate vehicular traffic. Safety of the bridging material will be met by ensuring that no more than the maximum permissible trenching width and length to ensure structural support, shall be exposed at any one time. In addition, the contractor shall provide ingress to and egress from public streets at all times. Should conditions warrant, the contractor may hire personnel to control the flow of traffic around the construction area.

The contractor shall perform all applicable construction work in accordance with BWS Water System Standards and Approved Materials List and Standard Details (1985), the Standard Specification for Public Works Construction of the Department of Public Works (DPW), City and County of Honolulu (September 1986), and the Revised Ordinances of Honolulu, 1978, as amended.

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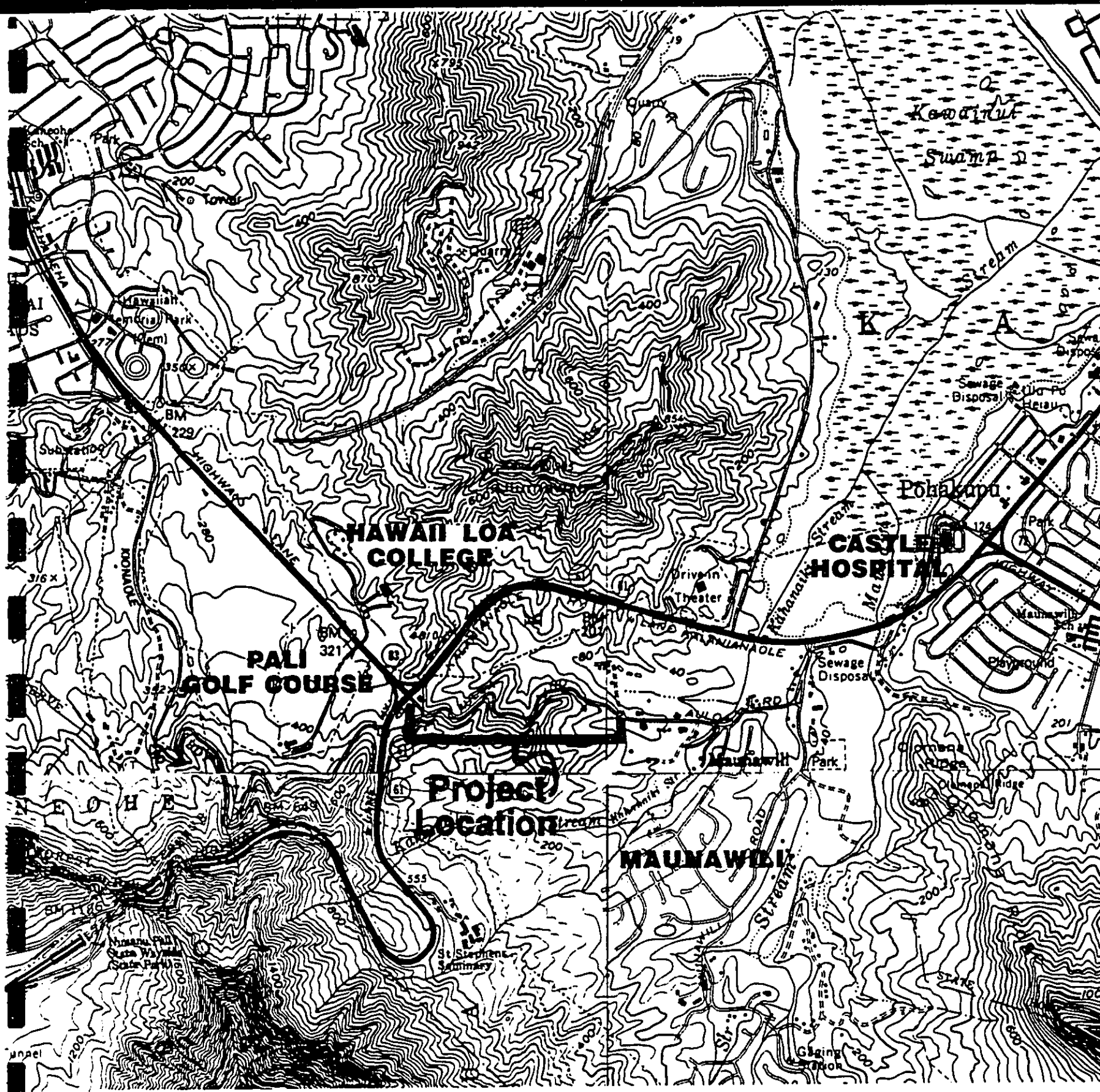

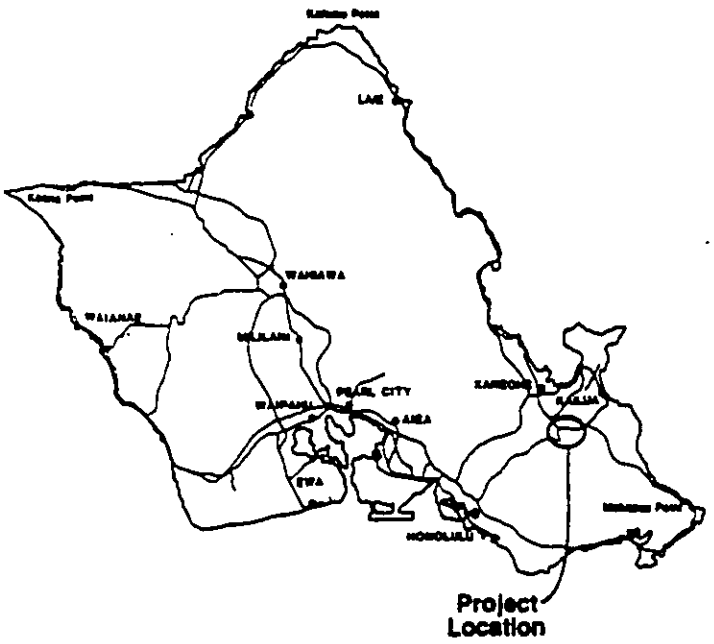

Figure 2-3
SURROUNDING LAND USES

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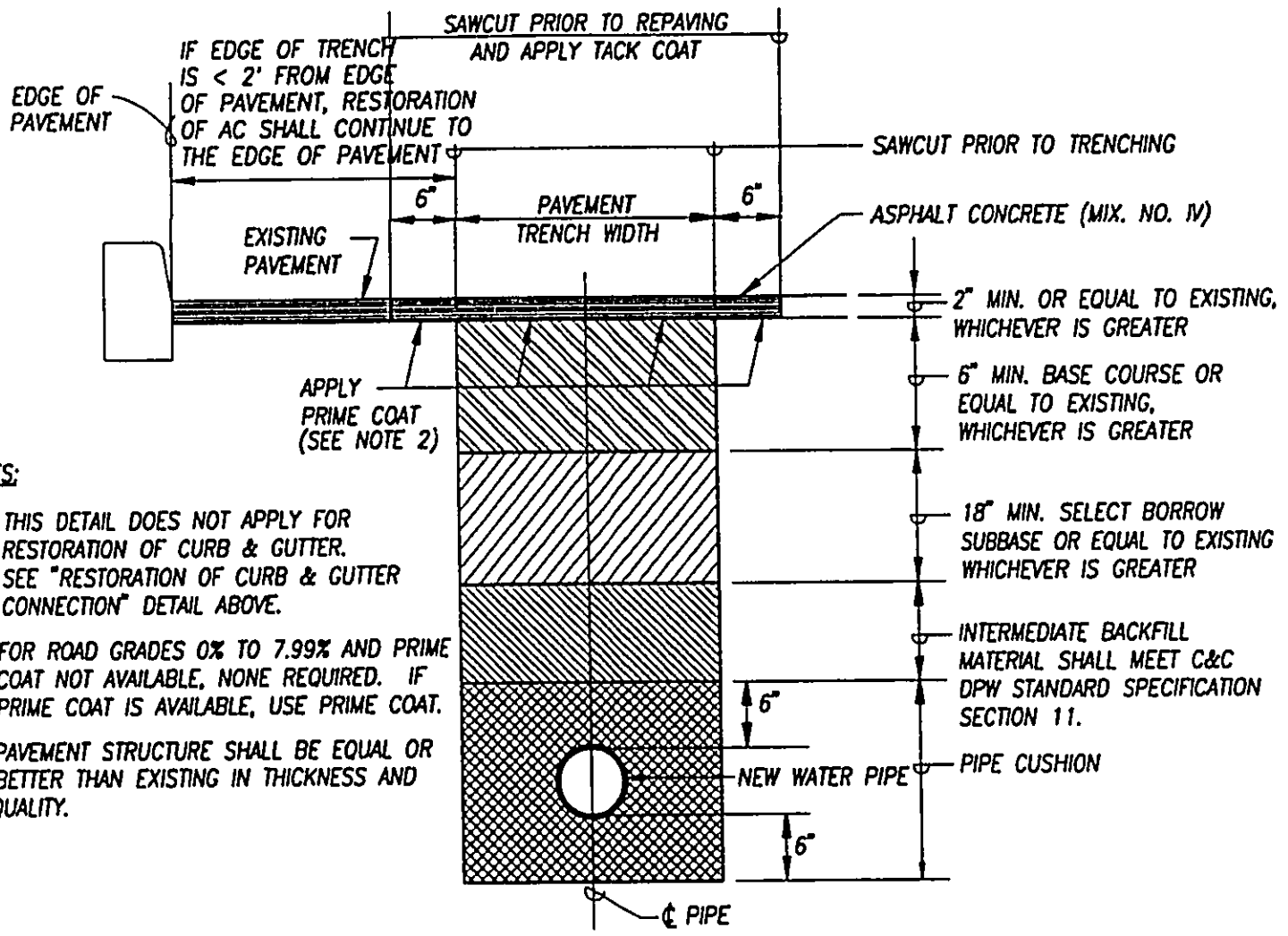
Board of Water Supply
AULOA ROAD 16-INCH MAIN
City and County of Honolulu

R. M. TOWILL CORPORATION
Sept 1997



NOTES:

1) THIS DETAIL DOES NOT APPLY FOR RESTORATION OF CURB & GUTTER. SEE "RESTORATION OF CURB & GUTTER CONNECTION" DETAIL ABOVE.

2) FOR ROAD GRADES 0% TO 7.99% AND PRIME COAT NOT AVAILABLE, NONE REQUIRED. IF PRIME COAT IS AVAILABLE, USE PRIME COAT.

3) PAVEMENT STRUCTURE SHALL BE EQUAL OR BETTER THAN EXISTING IN THICKNESS AND QUALITY.

Figure 2-4
TYPICAL TRENCH CROSS-SECTION

Not to Scale

Board of Water Supply
AULOA ROAD 16-INCH MAIN
City and County of Honolulu

R. M. TOWILL CORPORATION
Feb 1998

Construction and restoration of the road right-of-way facing the intersection of Kamehameha Highway and Kalanianaole Highway shall be performed in accordance with applicable sections of the "Standard Specifications for Road and Bridge Construction" (1976), and "Specifications for Installation of Miscellaneous Improvements Within State Highways" (1974), Division of Highways, State Department of Transportation (DOT). All work shall also conform with the "Administrative Rules of Hawaii, Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways" and the "Manual of Uniform Traffic Control Devices for Street Maintenance Operations." Construction plans shall also be submitted to the Highways Division, DOT.

The main will require hydrostatic testing and chlorination prior to BWS municipal service. Chlorination of the water main will be accomplished according to the following BWS specifications (Water System Standards, Volume I, BWS, 1985):

- Flush new system adequately with chlorinated water of at least 50 mg/l concentration; or,
- Retention of chlorinated water (50 mg/l) overnight; or,
- Expose interior surfaces of pipes with chlorinated water (300 mg/l) for three (3) hours.

Hydrostatic testing of the 16-main will be in accordance with applicable Federal, State, and City requirements. Prior to construction, a plan indicating the locations and amounts of chlorinated water to be discharged will be submitted by the contractor for review and approval of DOH.

2.2.3 Project Schedule and Cost

Construction is tentatively scheduled for fiscal year 1999, which begins July 1998 and continues through June 1999. The estimated cost of the project is approximately $1.9 million in 1997 dollars. Funding will be from the BWS, Research and Facility Improvement Program.

Chapter 3
ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND MITIGATION

3.1 LAND USE AND OWNERSHIP

3.1.1 Existing Environment

The project site involves Auloa Road, from Castle Junction eastward for a distance of 4,100 linear feet. Auloa Road is owned and under jurisdiction of DTS, City and County of Honolulu. The 50 foot wide right-of-way is frequently cleared of vegetation by road and utility company maintenance crews. Off both sides of the road right-of-way are undeveloped areas of parcels owned by Kaneohe Ranch (TMK: 4-2-14:01), James C. Castle (TMK: 4-2-11:20), and the Harold K.L. Castle Trust Estate/Alice H. Castle Trust Estate (TMK: 4-2-11:02) (**Figure 3-1**).

3.1.2 Project Impacts and Mitigation Measures

No adverse impacts are expected to surrounding land uses. Disruption to individual businesses and residents using Auloa Road will be temporary and will last only as long as it takes to install each section of the transmission main. The contractor shall provide public access along Auloa Road at all times.

3.2 CLIMATE, TOPOGRAPHY AND SOILS

3.2.1 Climate

The project site is located within Maunawili Valley on the windward side of Oahu. Temperatures along the windward coast are equitable throughout the year. The mean annual temperature is between 72 and 85 degrees Fahrenheit. The area averages 83 inches of rain annually, with the greatest amount of rainfall occurring from the months of

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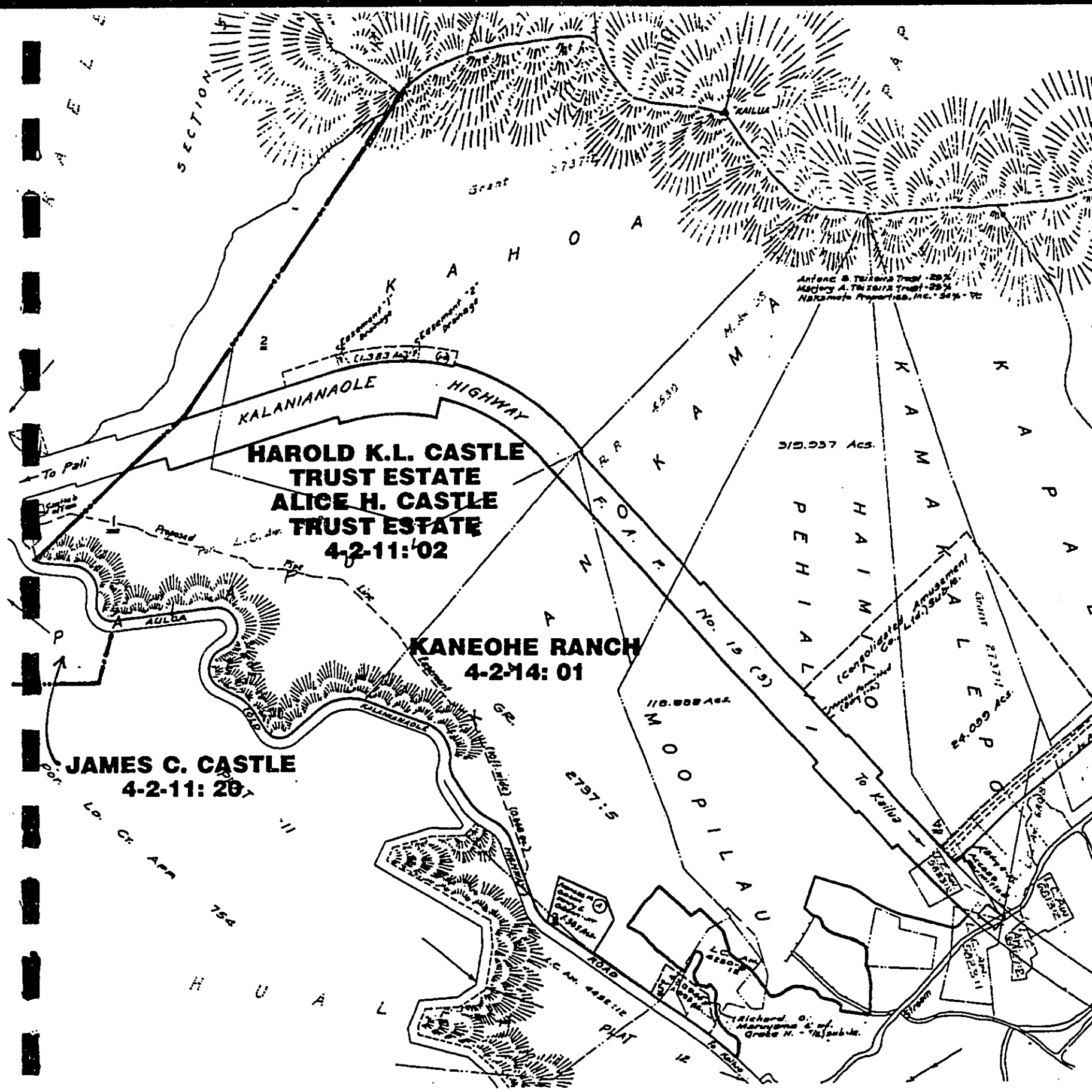

Figure 3-1
ADJACENT LAND OWNERSHIP

SOURCE:

TAXATION MAPS BUREAU TERRITORY OF HAWAII TAX MAP		
THIRD DIVISION		
ZONE	SEC.	PLAT
4	2	14
CONTAINING PARCELS		
NO SCALE		

Not to Scale

Board of Water Supply
AULOA ROAD 16-INCH MAIN
City and County of Honolulu

R. M. TOWILL CORPORATION
Sept 1997

November through January. August and September are normally the hottest and driest months and January through March are the coolest and wettest. Winds are generally from the northeast except during the winter months when storms are usually accompanied by south winds.

3.2.2 Topography and Soils

The project site primarily consists of the Auloa Road pavement. The paved roadway and adjacent shoulders are constructed according to State and County standards governing public thoroughfares. This generally requires slopes that are limited to 7 - 8 percent.

Topography surrounding the site has an average slope of approximately 5.8 percent. The greatest slopes are found on the western portion of the project site.

Most of Windward Oahu, including the area surrounding the proposed site, is covered by clay soils originating from old alluvium and colluvium from the Koolau Range or as residuum from the ridges between streams. The U.S. Department of Agriculture (1972) mapped the distribution of soils types found along the proposed water main alignment (**Figure 3-2**). Weathered rock comprises the geologic surface areas at and near the project site, which consists of soils of the Alaeloa and Helemano soil series including: AeE, Alaeloa silty clay, 15 - 35% slopes; HLMG, Helemano silty clay, 30 - 90% slopes; and, ALF, Alaeloa silty clay, 40 - 70% slopes. These soils are considered to have a moderate to severe potential for erosion. The gently sloping area to the west of the project is older alluvium consisting of the Kaneohe soil series. The younger alluvium in the bottom of the drainage ways consists of the Hanalei soil series.

3.2.3 Project Impacts and Mitigation Measures

No significant negative impact to soils in the project area is anticipated. Construction within paved areas will involve use of appropriate fill material and

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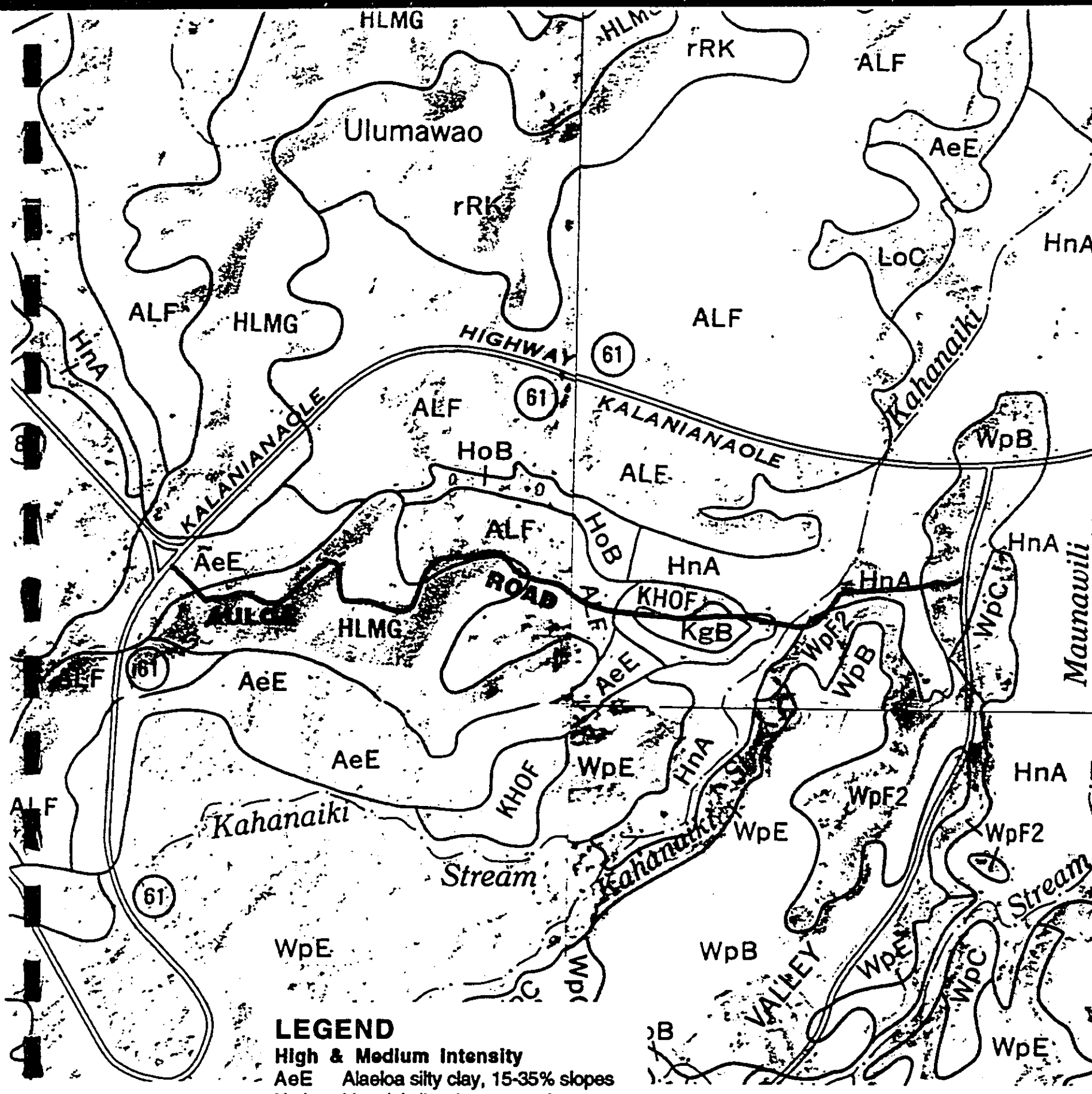

LEGEND

High & Medium Intensity

AeE	Alaeloa silty clay, 15-35% slopes
HnA	Hanalei silty clay, 0-2% slopes
HnB	Hanalei silty clay, 2-6% slopes
KgB	Kaneohe silty clay, 3-8% slopes
LoC	Lolekaa silty clay, 8-15% slopes
WpB	Waikane silty clay, 3-8% slopes
WpC	Waikane silty clay, 8-15% slopes
WpE	Waikane silty clay, 25-40% slopes
WpF2	Waikane silty clay, 40-70% slopes, eroded

Low Intensity

ALF	Alaeloa silty clay, 40-70% slopes
HLMG	Helemano silty clay, 30-90% slopes
KHOF	Kaneohe silty clay, 30-65% slopes

Reconnaissance

rRK	Rockland

Figure 3-2
SOILS MAP

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restoration to preexisting conditions. Construction within areas of shoulder without pavement may temporarily disturb the soil retention values of existing vegetation and expose the soil to erosional forces. The impact of construction activities on soils will be mitigated by several measures, as outlined in the following regulations:

- Grading, Grubbing and Stockpiling Ordinance No. 3968, 1972, City and County of Honolulu;
- Soil Erosion Standards and Guidelines, 1975, Department of Public Works, City and County of Honolulu;
- Erosion and Sediment Control Guide for Hawaii, 1968, U.S. Department of Agriculture (USDA), Soil Conservation Service; and,
- Public Works Infrastructure Requirements (Relating to Grading), Ordinance No. 96-34, 1990, City and County of Honolulu.

Prior to issuance of the grading permit, the project applicant must submit an erosion control plan for approval by City and County Department of Public Works, which will include applicable measures as specified in the regulations cited above. The erosion control measures may include, but are not limited to, the use of cut-off ditches, temporary ground cover, and detention ponds.

Upon completion of construction the site will be returned, as much as practicable, to existing preconstruction conditions.

3.3 GEOLOGY AND HYDROLOGY

3.3.1 Geology

The project site is located on remnants of the Koolau Volcano caldera structure. The Koolau volcano was initially broad-shaped and primarily composed of a series of thin, overlapping, gently sloping basaltic lava flows. The main caldera of the Koolau volcano extended from Waimanalo through Kaneohe. Following the Koolau Volcanic era was a

period of extensive erosion and elevated sea levels, accounting for layers of alluvial and calcareous material. Renewed volcanic activity from the more recent Honolulu Volcano resulted in scattered volcanic formations over alluvial and sedimentary layers.

3.3.2 Hydrology

No perennial streams occur within the project site. The nearest stream is Kahanaiki which feeds into Kawainui Marsh and eventually joins Maunawili Stream (**Figure 3-3**). The gully behind the Kaneohe Ranch Office building joins Kahanaiki Stream approximately 1 mile down slope.

Ground water for the windward side is supplied by the Windward Water Use District. No ground water development exists in the project area. Rocks of the Kailua Member of the Koolau Basalt, which occur in the area, are usually so dense that they are essentially impermeable (Takasaki, et al., 1969). However, small amounts of ground water may occur in seeps through joints in the bedrock and at contacts between soil and rock or between dissimilar soils. It is possible that some of this groundwater may be encountered during construction trenching. This groundwater would need to be removed during installation to ensure dry working conditions.

3.3.3 Project Impacts and Mitigation Measures

The proposed project will not create substantial physiographic or geologic impacts. Installation of the 16-inch main will involve trench excavation to a depth of approximately 6 to 8 feet over most of the project and will not increase the amount of impermeable surface in the area or cross any streams.

Dewatering may be necessary if groundwater is encountered during construction trenching. Should dewatering be required Best Management Practices (BMPs) will be employed as part of the requirements of the National Pollutant Discharge Elimination

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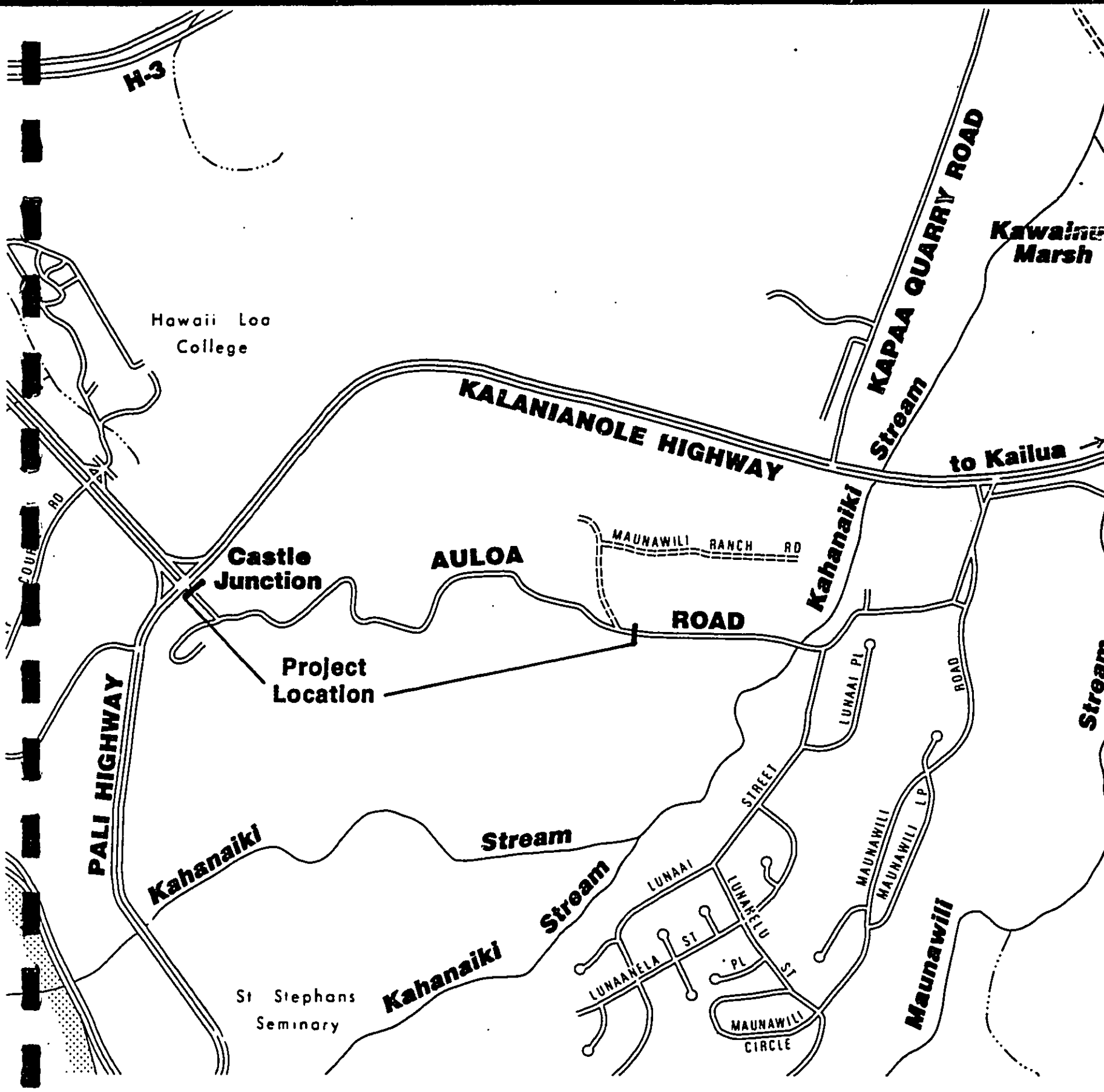

Figure 3-3
HYDROLOGY

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System (NPDES) Permit to mitigate any potential for adverse impacts. These BMPs may include, but not be limited to the following:

1. Clearing and excavation/trenching will be held to the minimum necessary for site access and equipment operation;

2. Construction will be staged to minimize the exposure time of excavated/trenched areas. Areas of one stage will be stabilized to prevent co-mingling of runoff before another stage can be initiated. Stabilization shall be accomplished by temporarily or permanently protecting the disturbed surface from rainfall impacts and runoff; and

3. The contractor will ensure that storm water control measures will be in place and functional before trenching operations begin. The control measures shall be maintained throughout the construction period. Temporary measures may be removed at the beginning of the work day, but shall be replaced at the end of the work day.

3.4 NATURAL HAZARDS

3.4.1 Flood Zone

The Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) of September 28, 1990, identifies the project site as lying within "Zone D", an area in which flood hazards are undetermined. This designation indicates the site may or may not be subject to floods which may inundate the location of the project. (National Flood Insurance Program, 1990) (**Figure 3-4**).

3.4.2 Seismic Activity

The Uniform Building Code (UBC) provides minimum design criteria to address potential for damages due to seismic disturbances. The UBC scale is rated from Seismic Zone 1

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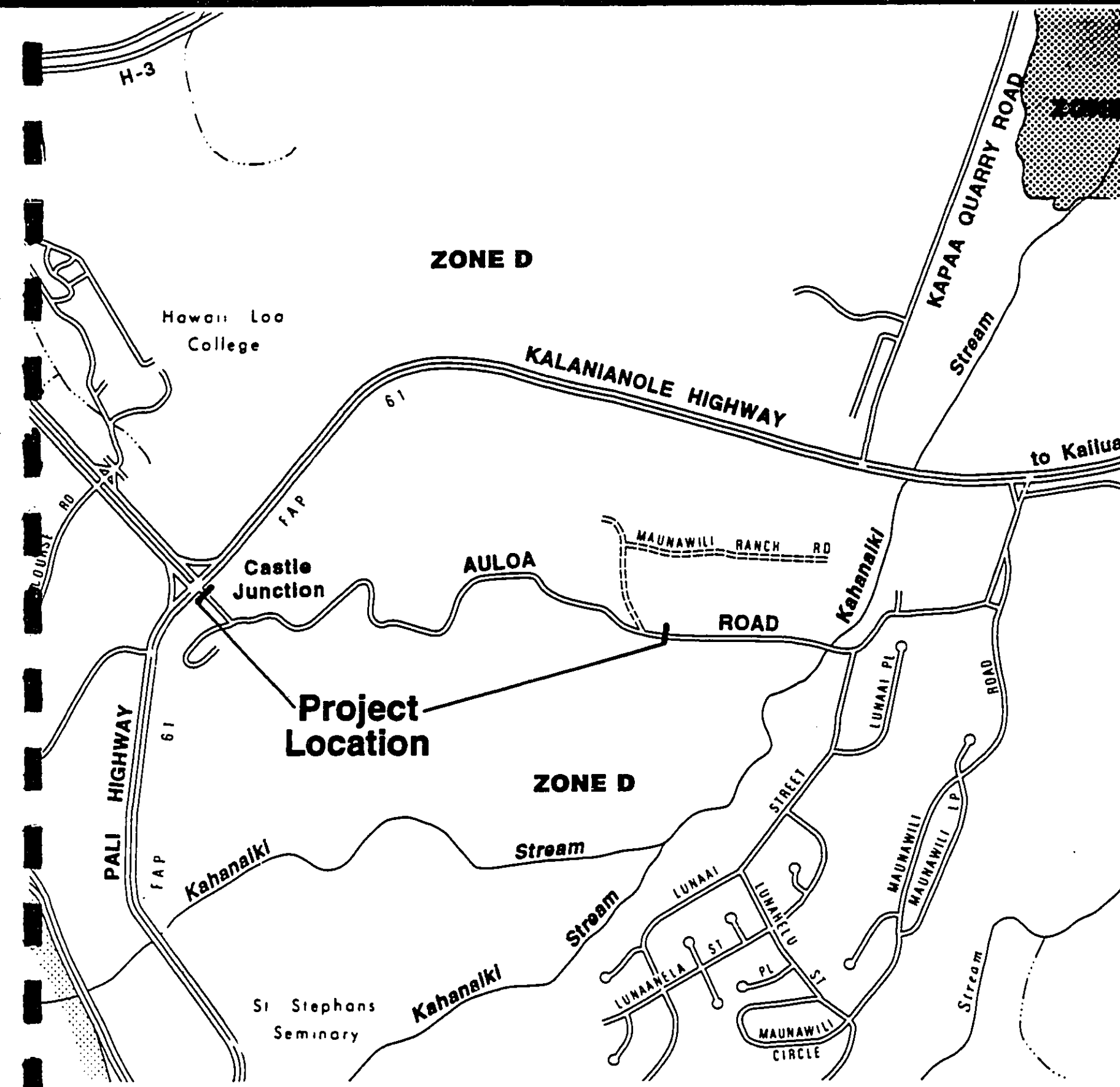

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
ZONE A — No base flood elevations determined.

OTHER AREAS
ZONE D — Areas in which flood hazards are undetermined.

Figure 3-4
FEMA FIRM MAP

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through Zone 4, with 1 the lowest level for potential seismic induced ground movement. Oahu has been designated within Seismic Zone 1. BWS , in the interest of public health and safety has adopted UBC Seismic Zone 3 standards for all its structures. All structures proposed for this project, therefore, will be built according to standards for UBC Seismic Zone 3.

3.4.3 Project Impacts and Mitigation Measures

Flooding is not anticipated to affect the proposed project. During construction potential for impacts due to storm runoff will be addressed by use of erosion control measures in accordance with City and County of Honolulu, Soil Erosion Standards and Guidelines, 1975, and Erosion and Sediment Control Guide for Hawaii, Soil Conservation Service, 1968. Following construction the water main will have a minimum cover of 3 feet. Fill over the water main will be properly compacted with the surface restored to preexisting conditions.

Although seismic risk is expected to be minimal the water main shall be installed in accordance with UBC Seismic Zone 3 standards. No further mitigation measures are required or recommended.

3.5 DEMOGRAPHICS

3.5.1 Demographics

The project area is located within the Koolaupoko Development Plan District and community of Maunawili on the Island of Oahu. According to the 1990 census, the resident population of Koolaupoko which encompasses Maunawili was 117,694. This represents an increase of 7.6 percent from the previous 1980 census with a resident population of 109,373. According to the State of Hawaii Data Book, 1995, the most recent counts for Koolaupoko indicates the growth trend is continuing with a 1994 population of 122,900, representing a 4.4 percent increase since 1990.

The population of the City and County of Honolulu, in comparison, grew by 9.7 percent, from 762,565 in 1980 to 836,231 in 1990. Projections indicate this growth will continue to 2010 with a resident population of 980,000 by 2010 (DBEDT 2020 Series, 1997).

3.5.2 Project Impacts and Mitigation Measures

Demand for water in Windward Oahu is projected to increase from 17.7 million gallons per day (mgd) in 1990 to 18.4 mgd in the year 2010 -- an estimated increase of about 4 percent (Wilson Okamoto & Associates, 1996). The proposed water line will assist in providing the capacity and reliability to accommodate projections for increased demand in the Windward area. The proposed project will also relieve future dependance on an aging 12-inch water main in need of replacement.

Construction of the water main will be bid by BWS to a contractor who will be responsible for the project. The contractor and construction crew members will likely come from all areas of Oahu, including some workers from within the Windward area. The contractor and workers will positively benefit from the business and employment opportunities provided by the proposed project. Economic benefits derived by the contractor and construction crew, however, are expected to be insignificant when compared to the overall population of the Windward area.

3.6 ROADWAYS AND TRAFFIC

3.6.1 Roadways and Traffic

Castle Junction is the first major intersection north of the Pali Tunnels and is the focal point of a number of major routes in Windward Oahu. Kalanianaole Highway and Pali Highway are multilane thoroughfares connecting the suburban areas of Kailua and Waimanalo with Honolulu. This thoroughfare permits access to Oahu's urban, business, and governmental center. Kamehameha Highway, also a multilane thoroughfare to the north and northwest, permits access to Kaneohe and Kahaluu, and access into Honolulu via Pali Highway to the

south, and Likelike Highway to the north. Auloa Road, unlike the major thoroughfares at Castle Junction is a two lane roadway primarily serving the residential community of Maunawili.

According to the EA for the Castle Junction Interchange, the estimated 1995 average daily traffic on Auloa Road amounted to 1,253 vehicles in the segment from Castle Junction to the terminus of the proposed water main. Average daily traffic counts on the adjoining major highways are significantly higher at 26,241 vehicles on Kamehameha Highway, 44,824 vehicles on Kalanianaole Highway, and 38,836 vehicles on Pali Highway. A breakdown of average daily traffic counts are identified in **Figure 3-5.**

3.6.2 Project Impacts and Mitigation Measures

The proposed project may result in limited traffic congestion during construction. Potential for traffic impacts, however, will be limited to the 4,100 linear foot section involving the water main. Measures to minimize traffic congestion will include but not be limited, to the following:

- The contractor will schedule work activity between the hours of 8:30 a.m. to 3:00 p.m., Monday through Friday, excluding State holidays. This construction schedule will help to minimize conflicts with morning and afternoon peak traffic periods;

- As required, the contractor's heavy truck traffic will be scheduled to avoid Auloa Road during the morning and afternoon peak traffic periods; and,

- During construction, at least one through-lane will be open to traffic. Should conditions warrant, the contractor may use flag persons to control the flow of traffic around the construction site.

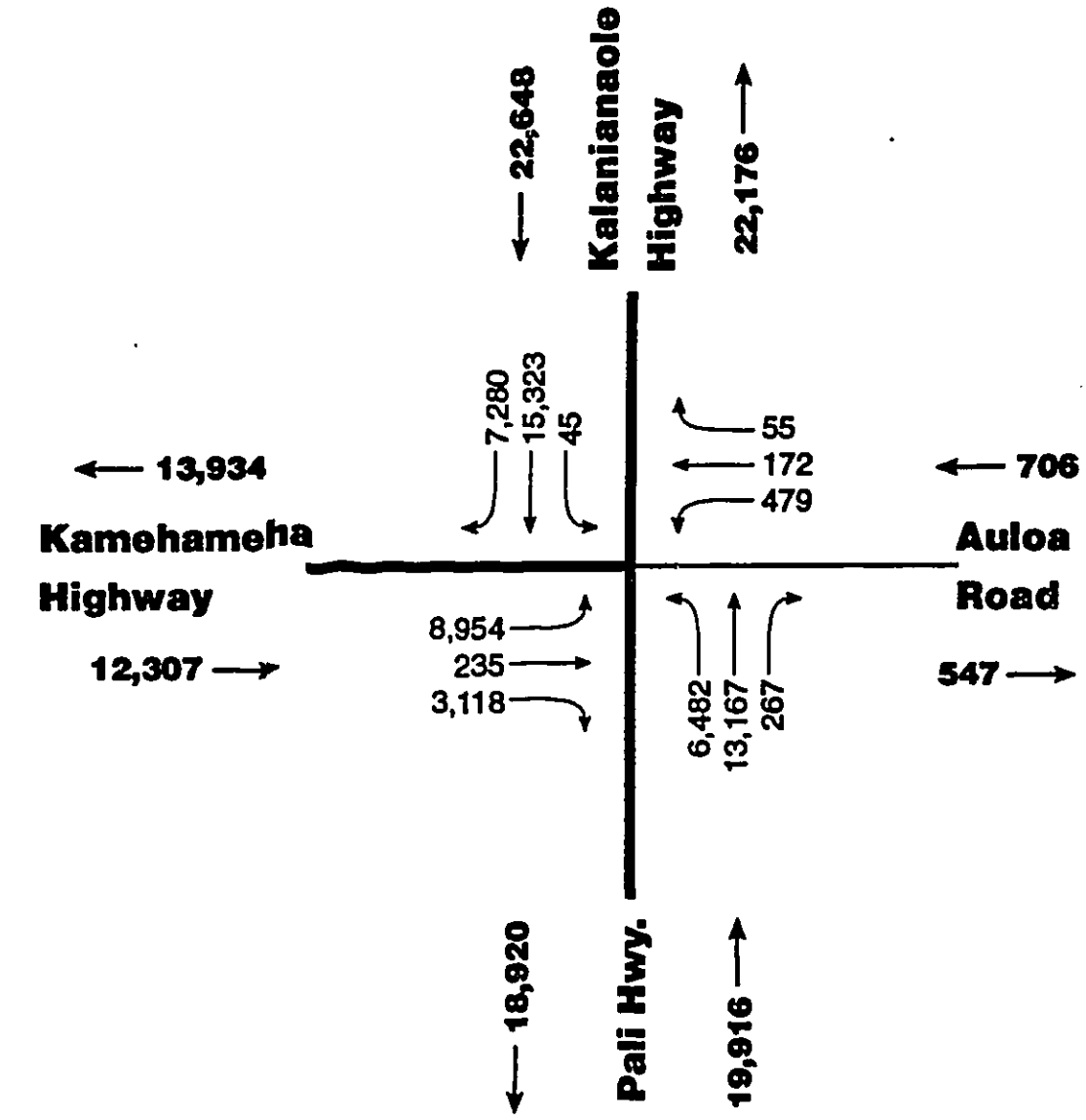

Figure 3-5
1995 AVERAGE DAILY TRAFFIC
Castle Junction Interchange Traffic Study

SOURCE: Environmental Assessment, Castle Junction Interchange, City and County of Honolulu, Project No. RF-061-1(17), 1990

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3.7 VISUAL AND RECREATIONAL RESOURCES

3.7.1 Visual and Recreational Resources

The project area is generally void of man-made structures except for the road and telephone poles.

The project area is located in a rural setting. Lands along the water main are relatively undeveloped. The Maunawili residential community is located to the east and lies along Auloa Road. Other adjoining land uses located away from the project site include Hawaii Loa college to the north, Pali Golf Course to the southwest, and Castle Hospital to the southeast.

No public recreational resources are located along the proposed alignment. The Pali Golf Course, a public 18-hole golf course with club-house and driving range facilities, is the only recreational facility in the vicinity of the proposed project. Pali Golf Course is owned and managed by the City and County of Honolulu.

3.7.2 Project Impacts and Mitigation Measures

Construction personnel, equipment, and trenchwork will be visible along Auloa Road during construction. Equipment may include backhoes; water, equipment and cement trucks; pipe sections; and, related appurtenances. The trench sections are expected to be ±4 feet wide. Length of trenches will be based on construction requirements. Appurtenances to the water main include fire hydrants visible at the surface. Below ground valves and fittings will not be visible. Fire hydrants will contribute to fire safety of the area. Valves and fittings will be necessary to the proper functioning of the water main and will provide a means of shutoff in the event of a break. Any potential for visual impacts due to construction will be temporary in nature and is expected to return to preconstruction conditions within approximately 1-year following the end of construction.

Construction of the 16-inch water main is not expected to impact recreational resources in Maunawili. The proposed project would not impede access to the Pali Golf Course and when complete will have no lasting adverse visual or recreational impact to the area.

3.8 ARCHAEOLOGICAL RESOURCES

3.8.1 Archaeology

An archaeological reconnaissance survey of the site was completed by Cultural Surveys Hawaii, in October 1997 (**Appendix**). According to the results of the survey,

> "The [Auloa Road] right-of-way was observed to comprise almost entirely of a deep cut along the side of a ridge. Portions of the right-of-way, on the downslope side of the cut, consist of fill retained by cement walls. The roadway itself is constructed of asphalt over cement.
>
> No surface archaeological sites were observed within the Auloa Road right-of-way itself or in areas immediately adjacent to the right-of-way. The extensive excavation of the ridge to create the level road surface precludes the likelihood of any subsurface archaeological deposits directly beneath the right-of-way.
>
> The only structures of historical interest in the near vicinity of the right-of-way are located at Castle Junction. On the makai side of Auloa Road, the Kaneohe Ranch Office Building constructed in 1941 - was placed on the State and National Registers of Historic Places in 1983 as site number 50-80-10-1360. On the opposite side of Auloa Road is a large, upright boulder which is a war memorial monument erected in 1946.
>
> Also observed during the field inspection was an apparent "shrine" area that has been created at the base of a banyan tree located at the hairpin turn of Auloa Road within the present study area. The shrine consists of ribbons, food offerings, incense

sticks, paper money, flowers and paper flowers placed on the trunk and between the roots of the banyan, generally on the side hidden from the road. The shrine is likely a Southeast Asian, presumably Laotian, expression of religiosity that has been set up within the last ten years or so, probably by members of a local immigrant community."

3.8.2 Project Impacts and Mitigation Measures

No short or long term impacts are expected. According to the reconnaissance survey both the Kaneohe Ranch office building and the 1946 war memorial are located in areas which will not be directly impacted by the proposed project. The construction contractor, however, will take into account the location of these structures during mobilization and removal of equipment.

The possible "Laotian Shrine," which is less than 50 years old, does not constitute a historical or archaeological site. The shrine is located within an existing banyan tree which will not be adversely affected or disturbed by construction.

According to the reconnaissance survey,

> "Based on absence of archaeological and historic sites within the portion of the Auloa Road right-of-way under study, no further archaeological investigation is recommended. Additionally, based on the extensive excavation for the Auloa Road alignment and on the unlikelihood of any subsurface archaeological deposits, on-site or on-call monitoring is not justified during future construction activities. However, if findings are encountered during ground disturbing activities, work should be halted in the immediate area and the State Historic Preservation Division of the Department of Land and Natural Resources should be contacted [at (808) 587-0047]."

Cultural assessment consultations were additionally handled through the Draft EA review process with a copy of the Draft EA provided to the State Department of Hawaiian Home

Lands and Office of Hawaiian Affairs. Copies of all comment letters received and appropriate responses are contained in Chapter 12 - Comments and Responses to the Draft Environmental Assessment Comment Period.

3.9 BIOLOGICAL RESOURCES

3.9.1 Flora

The Auloa Road right-of-way is approximately 50 feet wide. This area includes the road shoulder where the proposed water line will be installed. The road shoulder area was extensively cleared and graded during road construction, and maintenance work by the City and County and utility companies continue to keep the area clear of vegetation. Consequently, little to no vegetation is present in the immediate location of the proposed water line.

Vegetation adjacent to the project site, off the road shoulder are dominated by introduced plant species. These plants found alongside the margins of Auloa Road, tend to be weedy in nature as they are subject to frequent disturbances such as herbicide treatment, mowing, and vehicular and pedestrian traffic. No one particular species or small group of species is dominant, but rather a varied association of many different species is present. These species included:

Siris Tree or White Monkeypod *(Albizzia lebbeck)*
Java Plum *(Eugenia jambolana)*
Octopus Tree or Umbrella Tree *(Brassaia actinophylla)*
Common Ironwood *(Casuarina equisetifolia)*
Mango *(Mangifera indica L.)*
Wedelia *(Wedelia trilobata)*
Eucalyptus or Nuholani (various species present)

Ground cover throughout the area consists largely of Wedelia. Gullies and bluffs surrounding the site are vegetated by a mixed forest composed of additional varied tree and shrub species including fiddlewood *(Citharexylum spinosum L.)*, African tulip tree or fire bell *(Spathodea campanulata)*, monkeypod *(Samanea saman)*, and guava *(Psidium guajava L.)*.

3.9.2 Fauna

Fauna inhabiting the area surrounding the Auloa Road shoulder are primarily introduced species that utilize the surrounding forested area for habitat. Most of these bird species are exotics which include, but are not limited to the following:

Zebra Dove *(Geopelia striata)*
Common Indian Mynah *(Acridotheres tristis)*
Red-vented Bulbul *(Pycnonotus cafer)*
Northern Cardinal *(Cardinalis cardinalis)*
Red-crested Cardinal *(Paroaria coronata)*
House Finch *(Carpodacus mexicanus)*
White-rumped Shama *(Copsychus malabaricus)*
House Sparrow *(Passer domesticus)*

Although not observed at the project site, introduced and common species of mammals which could also be expected in the area include:

Roof Rat or Black Rat *(Rattus rattus)*
Polynesian or Hawaiian rat *(Rattus exulans)*
House Mouse *(Mus musculus)*
Small Indian Mongoose *(Herpestes auropunctatus)*

Because the site is adjacent to single family homes it is possible there may be feral dogs *(Canis familiaris)* and cats *(Felis catus)*.

3.9.3 Project Impacts and Mitigation Measures

The area surrounding Auloa Road has been heavily modified and has contributed to the apparent absence of rare, threatened and/or endangered species at the site. The road shoulder itself, where the proposed water line will be installed has little to no vegetation or habitat for fauna and therefore, is not anticipated to adversely affect the biological resources of the area.

To the extent possible, vegetation removal will be kept to a minimum. If necessary, the proposed alignment of the main will be adjusted to avoid the removal or damage to trees along the pipeline route. No further mitigation is proposed for impacts to the area fauna.

3.10 AIR QUALITY AND NOISE

3.10.1 Air Quality and Noise

General air quality in the Maunawili area is good due to minimal development of the area and the almost continual presence of trade winds. The primary source of airborne pollutants in the project area is from vehicular exhausts directly from Kalanianaole Highway, Pali Highway, Kamehameha Highway, and Auloa Road.

The rural character of the region and the relative absence of urban uses promotes low noise levels which are prevalent throughout the project area. Most noise is generated during the day from traffic along roadways.

3.10.2 Project Impacts and Mitigation Measures

Although there will be temporary effects due to construction activities and equipment, the proposed action is not expected to significantly affect air quality in the Maunawili area. Equipment that will be used during construction will emit exhaust and airborne

particulates. Construction will produce dust on limited sections involving earthwork. These impacts will be reduced through the use of dust control measures by watering, proper vehicle maintenance, and scheduling work to avoid peak traffic periods on Auloa Road. Also, normal tradewind patterns should disperse pollutant emissions generated by activities at the project site.

A temporary increase in noise levels due to construction activities is likely to occur adjacent to areas being worked on, especially from the use of heavy equipment. Any increase in noise due to construction will cease as work is completed along the alignment. To mitigate short-term impacts associated with construction, specific start and curfew times will be established for construction activities. In addition, the Contractor will be required to follow State and County regulations regarding noise control. Noise levels from construction activities are not expected to exceed allowable levels.

Chapter 4
RELATIONSHIP TO LAND USE DESIGNATIONS AND CONTROLS

4.1 HAWAII STATE PLAN

The Hawaii State Plan, Chapter 226, HRS, serves as a written guide for the future long range development of the State. The Plan identifies goals, objectives, policies, and priorities for the State.

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

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

> "(b) To achieve the general facility systems objective, it shall be the policy of this State to: (1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans." and "(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user" (Section 226-14, HRS).

The project would also conform to Section 226-16, Water, HRS,

> "(a) Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities" (Section 226-16, HRS).

4.2 STATE LAND USE LAW

The property is designated within the State Conservation District, General Subzone, and Agriculture District (**Figure 4-1**). A Conservation District Use Permit (CDUP) Application will be required for the portion of the project within the Conservation District. It is expected that uses proposed under the development would be consistent with objectives and policies of the State Land Use Law, Chapter 205, HRS.

4.2.1 State Conservation District

According to Chapter 13-5, Section 22, HAR, which governs uses in the State Conservation District, public purpose uses may be permitted as identified by the letter "D". Public purpose uses may require a Board of Land and Natural Resources (BLNR) permit, and where indicated a management plan. According to Chapter 13-5, Section 22, HAR:

> "P-6 Public Purpose Uses
>
> (D-1) Land uses undertaken by the State of Hawaii or the counties to fulfill a mandated governmental function, activity, or service for public benefit and in accordance with public policy and the purpose of the conservation district. Such land uses may include transportation systems, water systems, communications systems, and recreational facilities."

4.2.2 State Agriculture District

The State Agriculture District is intended to promote agricultural activities on lands with suitable soil characteristics. The accommodation of utilities is one of various permitted uses within this district. According to Chapter 205, HRS:

> "Section 4.5 - Permissible uses within the agricultural district
>
> (a)(7) Public, private, and quasi-public utility lines and roadways, transformer stations, communications equipment building, solid waste transfer stations,

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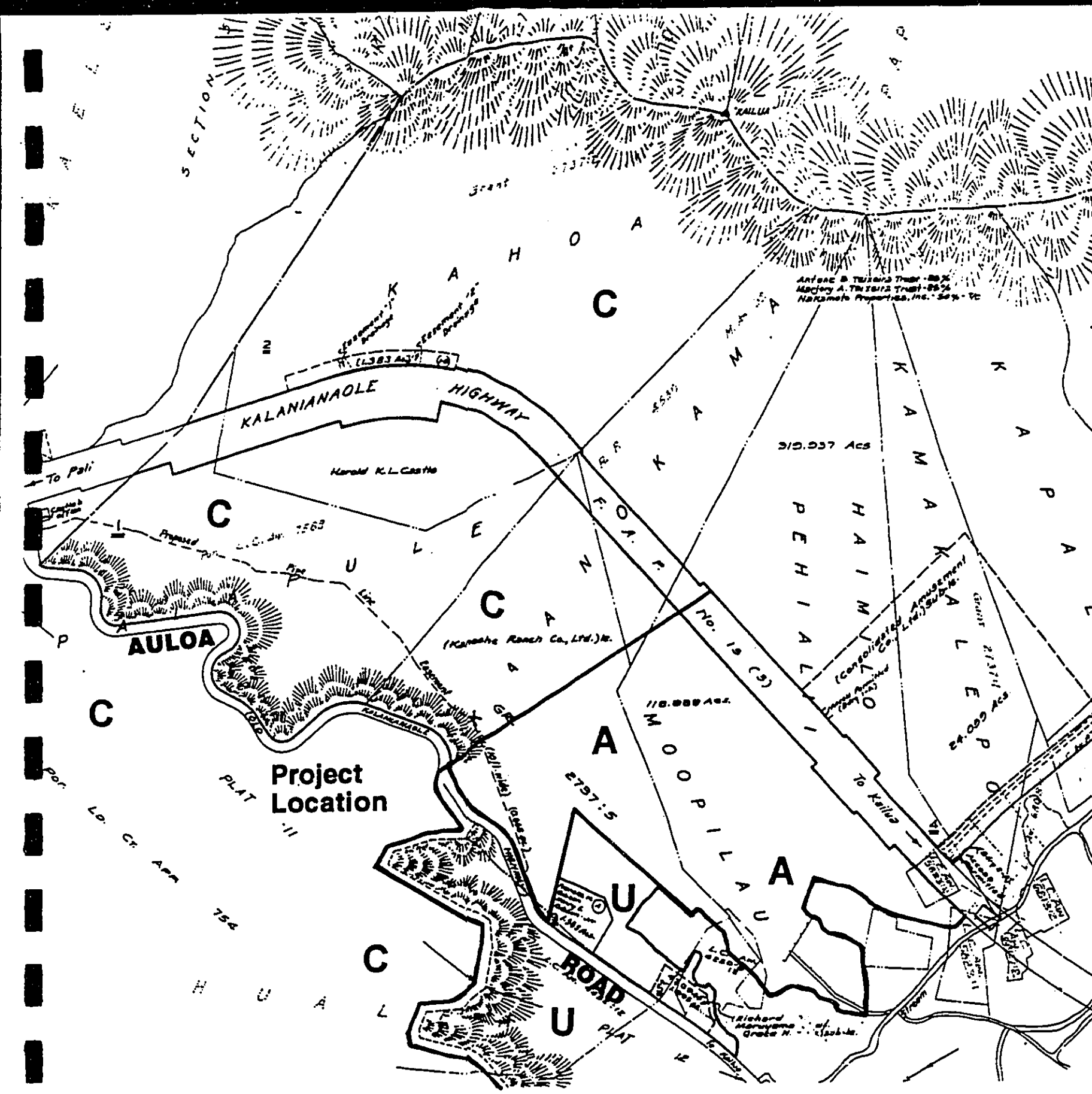

Figure 4-1
STATE LAND USE DISTRICT

Not to Scale

LEGEND

U	Urban
A	Agriculture
C	Conservation

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major water storage tanks, and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, or treatment plants, or corporations yards, or other like structures."

The proposed construction of the 16-inch main would be considered a public utility line providing potable water to area residents, commercial users, and businesses within the region. This use would be consistent with those identified for public purposes, above.

4.3 CITY AND COUNTY OF HONOLULU LAND USE DESIGNATIONS AND CONTROLS

According to the City and County of Honolulu, Development Plan Public Facilities Map, the subject parcel is designated P-1, Restricted Preservation District, and AG-2, General Agriculture District on the City's Zoning Map (**Figure 4-2**). Surrounding land uses fall within P-1, AG-2 and Country zoning.

4.3.1 P-1: Restricted Preservation District

The P-1, Restricted Preservation District, is governed in the City Land Use Ordinance (LUO) by referral to the appropriate State agencies. According to the LUO:

"5.10-1 Preservation uses and development standards

(a) Within the P-1 restricted preservation district, all uses, structures and development standards shall be governed by the appropriate state agencies."

The portion of the proposed project which falls within the P-1 District is coincident with the boundary of the State Conservation District, General Subzone. The State agency with jurisdiction over uses in the P-1 District is the State DLNR. A CDUP will be filed in order to comply with regulations governing uses in the Conservation District.

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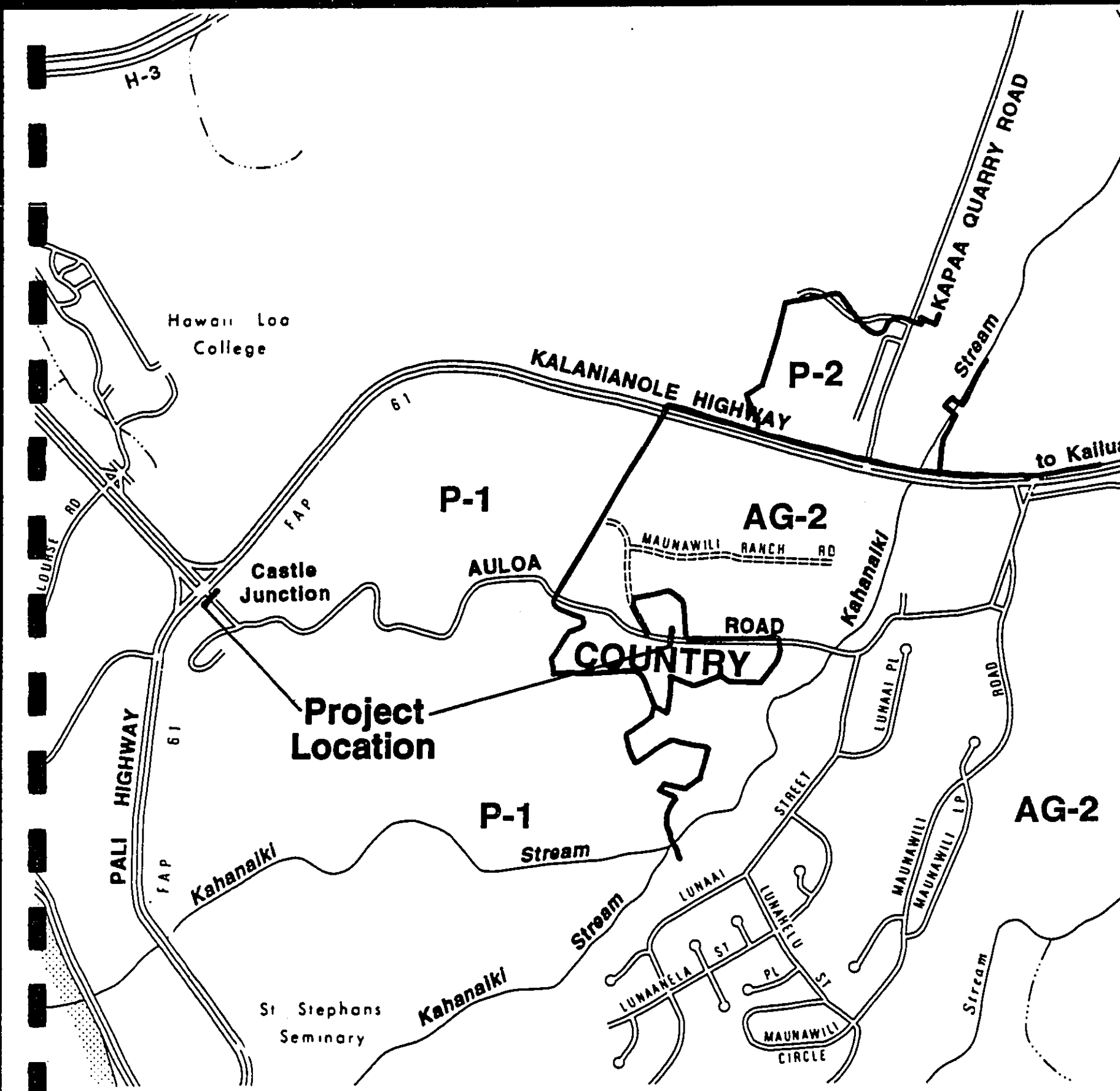

LEGEND

P-1 Restricted Preservation
P-2 General Preservation
AG-2 General Agriculture
C Country

Figure 4-2
COUNTY ZONING

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4.3.2 AG-2: General Agriculture District

The proposed use of the project which falls within the AG-2 zoning district would be consistent with the LUO which identifies the project as a Utility Installation, Type A. This is a permitted use in the AG-2 zoning district. According to the LUO:

> "Type A utility installations are those with minor impact on adjacent land uses and typically include: 46 kilovolt transmission substations, vaults, water wells and tanks and distribution equipment, sewage pump stations, and other similar uses" (LUO, City and County of Honolulu, April 1995).

Chapter 5
ALTERNATIVES TO THE PROPOSED ACTION

5.1 NO ACTION

The no action alternative was not considered a viable option because it does not fulfill the BWS mandate to ensure provision of potable water resources for the City and County of Honolulu. The no action alterative would mean continued reliance on an existing and aging 12-inch water main. Any break would mean a major disruption of service; the lost opportunity to replace an aging facility; and, the chance to increase the efficiency of BWS provided water service.

5.2 DELAYED ACTION

The delayed action alternative was also considered but was unacceptable because it would mean continued reliance on an aging 12-inch water main. Any benefits realized from delaying the action would be immediately lost in the event of a water main break. In addition, any economic benefits could similarly be lost by increased construction costs due to inflation.

5.3 USE OF EXISTING SITE

The site of the existing 12-inch water main is on relatively undeveloped land that has become heavily overgrown by vegetation. The site contains at least a decade of overgrowth which would need to be cleared prior to construction. Potential adverse impacts associated with clearing could include loss or destruction of habitat for rare or endangered native flora and fauna. There is probably less of a chance for impacts to significant archaeological or cultural resources, given that previous construction of the site would have led to destruction or data recovery of any remains.

Construction of an access road to mobilize equipment and personnel to the site would be required leading to need for further clearing of the site. Clearing and construction activities within a relatively undeveloped area could require preparation of biological studies and the development of appropriate mitigation measures. These activities represent effort which would be in addition to the cost of construction. Use of this site would increase the potential for adverse environmental impacts while increasing public costs. These consequences and the option of the preferred Auloa Road alignment, therefore, preclude this alternative from further consideration.

5.4 ALTERNATIVE SITES

No alternative sites were reviewed for the proposed action. The project has been identified as part of the BWS program of infrastructure improvements. The project site, therefore, has been prioritized for installation of the 16-inch main based on regional water needs and future population growth and development.

Chapter 6

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Development of the proposed project will commit the necessary construction and human effort, and fiscal resources. Construction activities will increase job opportunities as well as improve public facilities in the area which will promote long-term community gains. Use of the completed water main will benefit residents and visitors by ensuring safe and clean potable water to Windward Oahu.

Long-term gains resulting from the proposed project include the long term use and benefits accruing from this resource. The proposed project, therefore, will enhance economic productivity by making possible future development.

Chapter 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES BY THE PROPOSED ACTION

Development of the proposed project will involve the irretrievable loss of certain environmental and fiscal resources. However, the costs associated with the use of these resources should be evaluated in light of recurring benefits to the residents of Honolulu.

It is anticipated that the construction of the proposed project will commit the necessary construction materials and human resources (in the form of planning, engineering, construction and labor). Reuse for much of these resources is not practicable. Although labor is compensated during the various stages of development, labor expended for project development is non-retrievable.

Chapter 8
NECESSARY PERMITS AND APPROVALS

8.1 STATE OF HAWAII

8.1.1 Department of Land and Natural Resources

A Conservation District Use Permit (CDUP) application will be required for the portion of the project which falls within the State Conservation District, General Subzone. According to Chapter 13-5, Section 22, HAR, the proposed project would constitute a public purpose which is an identified use for which a permit may be considered.

8.1.2 Department of Health

National Pollutant Discharge Elimination System (NPDES) permits may be required. The following *general* permits must be filed separately:

- NPDES Notice of Intent (NOI) Form G - Discharges Associated with Construction Activity Dewatering: A Form G permit will be required if there is need to discharge treated groundwater effluent to "waters of the State of Hawaii" during construction (At this time groundwater is not expected to be encountered. However, should dewatering of groundwater be required, the construction contractor will file this permit).

- NPDES NOI Form F - Discharges Associated with Hydrotesting Waters: This permit will also be required during hydrostatic testing and disinfection of the water main prior to service. This permit will also cover discharges to "waters of the State of Hawaii".

The above permits address discharges to waters of the State of Hawaii classified as Class A open coastal waters (Kailua Bay) and Class II inland waters such as Kahanaiki Stream. Should any discharges be directed to Class AA waters of Kaneohe Bay or Class I inland waters an NPDES Individual Permit would be required. Under Chapter 11-55, HAR, both permit activities may be filed under a single NPDES *Individual* Permit.

The State DOH, Noise and Radiation Branch, will also require filing of a Noise Permit during construction and installation of the water main.

8.1.3 Department of Transportation

The State DOT will require a review of construction drawings and a request for right-of-entry for portions of the proposed project that may lie within the State highway right-of-way.

8.2 CITY AND COUNTY OF HONOLULU

8.2.1 Department of Transportation Services

The Department of Transportation Services will require a right-of-entry for construction.

8.2.2 Department of Public Works and Department of Waste Water Management

The Department of Public Works and Department of Waste Water Management will require the following:

- Construction Dewatering Permit to Discharge Groundwater into Municipal Separate Storm Sewer System: Permit required for discharges of construction dewatering effluent in the event groundwater is encountered.

- Permit to Discharge Effluent into the Municipal Storm Sewer System: This County permit will be required concurrently with DOH NPDES NOI Form F, for discharges of hydrotesting effluent.

Chapter 9
FINDINGS AND REASONS SUPPORTING DETERMINATION

In accordance with the provisions set forth in Chapter 343, Hawaii Revised Statutes, and the significance criteria in Section 11-200-12 of Title 11, Chapter 200, it is anticipated that this project will have no significant adverse impact to water quality, air quality, existing utilities, noise, archaeological sites, or wildlife habitat. All anticipated impacts will be temporary and will not adversely impact the environmental quality of the area. According to the significance criteria:

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

The proposed project is not anticipated to adversely impact any natural or cultural resources. The project site is within the Auloa Road right-of-way, which has already been subject to extensive disturbance during construction of the road. According to an archaeological assessment of the project site, "No further archaeological investigation is recommended. [And,] No on-site monitoring is justified during future construction activities" (Hammatt and Chiogioji, 1997).

An existing "Laotian Shrine," is described in Section 3.8. The "shrine," which is contained at the base of a banyan tree, is less than 50-years old and does not constitute a historical or archaeological site. The proposed project will not require that the "shrine" or the banyan tree be disturbed.

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

The proposed 16-inch water main will be within the Auloa Road right-of-way which is consistent with the existing public infrastructure use of the site. This location will facilitate future water main maintenance and repair operations, while

the placement of fire hydrants along Auloa Road, will help to increase fire safety for area travelers and residents. When completed, the fire hydrants will be visible along the roadway, while the water main will be buried with no visual impacts.

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

   The proposed project is consistent with the environmental polices, goals and guidelines in Chapter 343, HRS, and the National Environmental Policy Act. Potential sources of adverse impacts have been identified and appropriate measures developed to mitigate or minimize impacts to negligible levels.

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

   The proposed project is intended to ensure the long-term transmission of clean, potable water necessary for the future health, welfare, and growth of the surrounding Maunawili community and Windward Oahu region.

5. *Substantially affects public health* -

   The proposed project will be developed in accordance with federal, state, and City and County of Honolulu, rules and regulations governing public safety and health. The primary public health concerns will involve air, water, noise, and traffic impacts. However, it is expected that these impacts can be minimized or brought to negligible levels by appropriate use of the mitigation measures described in this document.

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

   The proposed project is part of the BWS program for maintenance and upgrade to its potable transmission system. Although the transmission system is designed to

serve the present and future population of the area, the project itself, however, will not generate new population growth.

7. *Involves substantial degradation of environmental quality -*

The proposed project will be developed in accordance with the environmental polices of Chapter 343, HRS, and the National Environmental Policy Act. The project site is on land which has been previously disturbed during construction of Auloa Road. The proposed project can be considered to be less obtrusive than this previous activity since it will only involve trenching and installation of a 16-inch water main within the existing road right-of-way.

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

The proposed project addresses the needs of existing and future area residents, businesses, and institutional users. Although the project will enhance reliability of potable water transmission, the construction of the water main itself, will not generate future population growth or demand for development.

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

There are no endangered flora or fauna species within the project site.

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

Any potential impacts to air, water quality, or noise levels will be addressed by use of appropriate measures described in this document.

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

The proposed project is located in an area appropriate for installation of a water main. The project site does not contain any especially sensitive environmental characteristics which would detract from this activity.

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

The proposed project calls for installation of a 16-inch water main below ground. When completed, there will be no adverse visual impacts. Fire hydrants, necessary to ensure fire safety, will be installed at various locations along Auloa Road.

13. *Requires substantial energy consumption*

Sufficient energy will be used to install the 16-inch water main. Energy will also be used during the transport of construction equipment, machinery, and personnel to the project site. None of these activities are expected to result in use of energy significantly greater than similar water main installation projects.

Based on analysis and review of the above factors, it is expected that an Environmental Impact Statement (EIS) will not be required and that an anticipated Finding of No Significant Impact (FONSI) will be issued for this project.

Chapter 10

ORGANIZATIONS AND AGENCIES CONSULTED IN THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT

The following organizations and agencies were contacted during preparation of the environmental assessment:

10.1 STATE AGENCIES

Department of Land and Natural Resources (DLNR)

- Historic Preservation Division
- Commission on Water Resources Management (CWRM)

Department of Health (DOH)

- Environmental Management Division
- Office of Environmental Quality Control (OEQC)

Department of Business, Economic Development & Tourism (DBEDT)

- Land Use Commission (LUC)

Department of Transportation (DOT)

- Highways Division (DOT-H), Technical Review Branch

10.2 CITY AND COUNTY OF HONOLULU

Board of Water Supply (BWS)

Department of Public Works (DPW)

Department of Land Utilization (DLU)

Planning Department

Chapter 11

ADDITIONAL ORGANIZATIONS AND AGENCIES CONSULTED DURING THE 30-DAY DRAFT ENVIRONMENTAL ASSESSMENT COMMENT PERIOD

The following additional organizations, agencies, and individuals will be notified during the 30-day Draft Environmental Assessment comment period:

11.1 FEDERAL AGENCIES

U.S. Army Corps of Engineers

U.S. Department of the Interior

U.S. Fish and Wildlife Service (USF&WS)

U.S. Geological Survey

11.2 STATE AGENCIES

Department of Education (DOE)

University of Hawaii

Environmental Center

Department of Hawaiian Home Lands (DHHL)

Office of Hawaiian Affairs (OHA)

11.3 CITY AND COUNTY OF HONOLULU

Department of Transportation Services (DTS)

Building Department

Department of Parks and Recreation

Fire Department

11.4 PRIVATE AND COMMUNITY ORGANIZATIONS, AND ELECTED OFFICIALS

Honolulu City Council

Kailua Neighborhood Board No. 31

State Senator Marshall Ige

State House Representative David Pendleton

Sierra Club, Hawaii Chapter

Chapter 12

COMMENTS AND RESPONSES TO THE DRAFT ENVIRONMENTAL ASSESSMENT PREPARATION

This section contains the Draft EA comments received and the responses to comments.

R. M. TOWILL CORPORATION

420 Waiakamilo Rd #411 Honolulu, HI 96817-4941 (808) 842-1133 Fax (808) 842-1937

February 10, 1998

Librarian
Kailua Public Library
239 Kuulei Road
Kailua, Hawaii 96734

Dear Librarian:

SUBJECT: Transmittal of Draft Environmental Assessment for Auloa Road 16-Inch Water Main, Maunawili, Oahu, Hawaii

Please find attached a copy of the subject Draft Environmental Assessment. This document is forwarded for the Office of Environmental Quality Control (OEQC) public comment period commencing February 23, 1998, and ending March 25, 1998. We ask that this copy be placed on reserve. Comments received during this 30-day review period may be directed to:

Mr. Raymond Sato, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Sincerely,

Brian Takeda
Senior Planner

Attachment

BENJAMIN J. CAYETANO

STATE OF HAWAII
ENVIRONMENTAL COUNCIL

HARLAN H. HASHIMOTO
CHAIRPERSON

BARBARA ROBESON
VICE-CHAIRPERSON

MAR 1998

March 6, 1998

Raymond Sato
Board of Water Supply
630 South Beretania St.
Honolulu, HI 96843

Attention: Barry Usagawa

Dear Mr. Sato:

Subject: Draft Environmental Assessment (EA) for Auloa Road 16-Inch Water Main, Maunawili; TMK: 4-2-14

We have the following comments to offer:

1. Contacts: In the final EA include copies of any correspondence sent or received during the draft EA and pre-consultation phases for this project.

2. Site location: Section 5.3, *Use of Existing Site*, notes that the site with the existing 12-inch water main will not be considered for use. Section 5.4, *Alternative Sites*, notes that no alternative sites have been or will be considered. Please clarify where the proposed site is, and indicate the location of the existing site on Figure 2.2, so that the relation between the old and new sites is clear.

3. Water sources: Indicate current and future (actual and anticipated) sources of water that this main will carry.

4. Water transfer: According to the draft EA, the project will provide unused potable capacity to Honolulu which would partially relieve current demands on withdrawals from the Pearl Harbor aquifer. Please disclose whether the plan to transfer water from the windward side to Honolulu was discussed in any previous environmental impact statement, such as the *Windward Oahu*

Regional Water System Improvements EIS. If not, OEQC recommends that a new or supplemental EIS be prepared to evaluate the proposed transfer of water.

If you have any questions, please call Nancy Heinrich at 586-4185.

Sincerely,

GARY GILL
Director

c: Brian Takeda

BOARD OF WATER SUPPLY

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

April 29, 1998

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

Dear Mr. Gill:

Subject: Your Letter of March 6, 1998 Regarding the Draft Environmental Assessment for the Board of Water Supply's Proposed Auloa Road 16-Inch Water Main Project, Maunawili, Oahu, TMK: 4-2-14: 13

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Auloa Road 16-inch Water Main project.

We provide the following comments to your concerns:

1. Site Location

   The existing 12-inch water main alignment is within an inaccessible forested area. The main is therefore, being relocated into the Auloa Road right-of-way to increase accessibility for main break repairs.

2. Water Sources

   The proposed 16-inch main will be part of the Windward high service transmission system providing service to portions of the Koolaupoko district between the 172-foot and 400-foot elevations, which includes the upper Maunawili Valley community. Existing sources serving the Maunawili area are from sources in Kahaluu and Haiku valleys. Maunawili does not have any viable potable water sources.

3. Water Transfer

   The water main size is being increased from 12-inch to 16-inch because pipeline velocities are high due to the smaller diameter size. The high velocities coupled with the normally high system pressures of the Windward 500' system, result in stress on the pipeline and more frequent main breaks. Main breaks within the forested area are much more difficult to access and repair and will result in longer disruptions of water service to Maunawili Valley.

   The 1988 Environmental Impact Statement for the Windward Oahu Regional Water System Improvements discussed our regional water transmission plans to provide water not needed in windward Oahu, to accommodate growth in Honolulu.

   The Windward regional transmission system is the 272' low service water system. Although there is capability to move water between the 272' and the 500' systems, the 500' high service system is primarily a local distribution system for the higher elevation areas.

The Final EA will include copies of any correspondence sent or received during the Draft EA and pre-consultation phases of this project.

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: Brian Takeda, R.M. Towill Corporation

Pure Water — our greatest need – use it wisely

Maunawili
Community Association

Est. 1963 • 1008 Lunaai Place Kailua, Hawaii 96734 261-8372

Date: March 16, 1998

Re: Draft Environmental Assessment
Auloa Road 16-Inch Water Main

Applicant: City and County of Honolulu Board of Water Supply
Barry Usagawa

Copies: R. M. Towill Corporation
State Office of Environmental Quality Control

According to the Development plans for our area, there will be no more housing projects in our area. Our community association is questioning why there would be a change from a 12" water main to a 16" water main.

We would like to attend a public meeting on this matter when it occurs. Please notify us at the above address or phone #. Our fax is 263-4128 is you would like to notify us by fax.

Thank you.

Barbara Locricchio

Submitted by: Barbara Locricchio
President
Maunawili Community Association

BOARD OF WATER SUPPLY

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

COPY

April 30, 1998

Ms. Barbara Locricchio, President
Maunawili Community Association
1008 Lunaai Place
Kailua, Hawaii 96734

Dear Ms. Locricchio:

Subject: Your Letter of March 16, 1998 to R.M. Towill Corporation Regarding the Draft Environmental Assessment for the Board of Water Supply's Proposed Auloa Road 16-Inch Water Main Project, Maunawili, Oahu, TMK: 4-2-14: 13

Thank you for reviewing the Draft Environmental Assessment for the proposed Auloa Road 16-inch water main project.

The proposed 16-inch main is part of the Windward 500-foot high service system providing local distribution service to portions of the Koolaupoko district between the 172-foot and 400-foot elevations. This includes the upper Maunawili Valley Community. The water main size is being increased from 12-inches to 16-inches because pipeline velocities are high due to the small diameter size. The high velocities coupled with the normally high system pressures of the Windward 500-foot system, result in greater stress on the pipeline and more frequent main breaks. Main breaks within the forested area are much more difficult to access and repair and will result in longer disruptions of water service to Maunawili Valley.

There will be two upcoming forums of discussion on the proposed project. A Conservation District Use Permit will be required from the Department of Land and Natural Resources; however, a date has not been scheduled. Secondly, a public hearing will be held at the Board of Water Supply on May 28, 1998 at 2:00 p.m. to appropriate funds for this project. We are also available to meet with your association if another time is more convenient.

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: Brian Takeda, R.M. Towill Corporation

98-1092

March 20, 1998

City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843
ATTN: Raymond Sato

Brian Takeda
R.M. Towill
c/o City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Sato:

The Board of Water Supply's proposal to replace the 12-inch water transmission pipe along Auloa Road with a 16-inch pipe is one small increment of an enormous project whose ultimate purpose is the dewatering of the Windward side of Oahu in order to "provide unused potable capacity to Honolulu." Other than the need to improve the water transmission system to Honolulu, the only justification for replacing the Auloa pipe at this time is that it is "aging and in need of replacement." However, the Maunawili subdivisions are tiny and relatively new compared to the Honolulu water mains that are constantly breaking due to age and wasting hundreds of thousands of gallons of water. I have never noticed any interruption in water service from the current pipeline, nor is there diminished water pressure in our water service. It would seem to be more in the public interest to replace the aging water pipelines in Honolulu that are obviously a threat to supplying municipal water, than to spend public money and resources where there is no problem.

Because the positive impacts of this proposal will accrue to Honolulu, the positive impacts are attributable not to this pipeline, but to the Windward water sources that feed Honolulu. Although BWS prepared an EIS in 1988 to consider impacts of this dewatering plan, new information has come to light and new circumstances have arisen that increases the negative impacts of the overall project and call into question the wisdom and necessity of this project. BWS needs to draft a Supplemental Environmental Impact Statement that addresses these new issues and provides definitive answers as to whether dewatering Windward Oahu is Constitutional and in the public interest.

The original EIS was written when sugar cane was using substantial Leeward water resources. Today there is no sugar on Oahu, and substantial groundwater resources are available on the Leeward side. Leeward Landowners have water permits for at least 75 mgd of Leeward groundwater that they currently have no use for. If unused groundwater supplies on the Windward side are available for BWS use, unused groundwater resources on the Leeward side are cheaper and more available for BWS use. The use of Leeward groundwater sources to meet projected demand for municipal water is an alternative that is now available to the BWS that was not considered in the original EIS.

The availability of groundwater on the Windward side is subject to new information and circumstances that arose since the 1988 EIS. A Commission on Water Resource Management (COWRM) study done for the purpose of considering designation of water resources on the Windward side found that there is a 1:1 correlation between groundwater withdrawals and loss of surface water in the Kahana, Koolaupoko and Waimanalo aquifer systems. Under COWRM's mandate to protect stream flows and traditional Hawaiian water rights, COWRM has determined that the water available from Windward aquifers, including a portion of the Kawailoa Aquifer, is 62.2 mgd (see attachment A). However, because the BWS does not propose to recover water from the Kawailoa source as part of the Windward regional dewatering plan, and COWRM has determined there is no developable water available from the Kahana, Koolaupoko and Waimanalo aquifer systems, the maximum available water from the Windward aquifers is 21.3 mgd from the Koolauloa Aquifer. New private well developments in Laie and Punaluu may have further diminished that amount.

However, even that amount is subject to Hawaiians' constitutional and property rights. The quantity of water subject to appurtenant property rights has not yet been determined, but HRS § 7-1 guarantees such rights. Additionally, the State manages hundreds of acres of ancient taro land in windward Oahu. Taro cultivation is a practice traditionally and customarily exercised for subsistence, cultural, and religious purposes by native Hawaiians, and Article XII § 7 of the Hawaii Constitution requires the State to reaffirm and protect those practices.

The State recognizes taro cultivation as a source and symbol of life to native Hawaiians, and a symbol of imprtant cultural values that are still in practice today. The Constitutional mandate may mean the State must permit and encourage taro growing on land it manages. Such actions would necessarily limit the amount of water available for municipal use, where other sources are readily available. The 1988 EIS did not consider Constitutionally-protected competing uses for Windward Oahu groundwater resources.

The re-emergence of wetland taro as an economic and subsistence factor for windward communities is a new circumstance not considered in the 1988 EIS. However, the 1988 EIS did note that taro growing would not be feasible if municipal water sources were used. Ancient lo'i are being recovered or already producing taro in Punaluu, Kahana, Waiahole, and Waimanalo communities. Taro is a commodity for which demand often exceeds supply. Windward and Leeward residents are working together to increase taro production on the Leeward side and to take advantage of the community-building aspects of taro cultivation.

Windward Oahu water resources sustain important to traditional Hawaiian gathering practices. Information gathered for the Waiahole contested case show that there is a significant improvement in native freshwater and estuarine fish when stream flows are increased to historical levels. Several streams in the Koolauloa aquifer system have outstanding aquatic resources, according to the Hawaii Stream Assessment Report done in December 1990 (see attachment B). In the 1988 EIS, BWS asserted it would protect Windward resources according to direction from COWRM. The 1988 EIS does not consider potsntial negative impacts on traditional gathering practices relative to freshwater and estuarine species. However, the BWS has an independent mandate under the State Constitution to protect those resources important to traditional gathering practices

Under the Hawaii Supreme Court decision in Public Access Shoreline Hawaii v. Hawaii County Planning Commission (PASH), Article XII § 7 is directly applicable to this project. Like the State CZMA, HEPA requires consideration of impacts on natural and cultural resources. Like the Hawaii County Planning Commission, BWS is obligated by Art. XII § 7 of the State Constitution to preserve and protect native Hawaiian rights. If agency development permitting actions like those in PASH are governed by Art. XII § 7 and HRS § 7-1, surely agency development activities are even more restricted by these provisions. Despite the fact that Article XII § 7 was adopted in 1978, the BWS failed to consider the constitutional mandate in its 1988 EIS.

On November 5,1995, the United States Fish and Wildlife Service listed *Pteris Lydgatei* as an endangered plant. *Lydgatei* is known from a handful of populations, with the largest being along Kaluanui stream. On October 15, 1996, USFWS listed *Gardenia manii*, known only from Windward Oahu. Members of my family have seen the Hawaiian Bat in Maunawili, and my father saw at least one bat frequently before the 1988 floods destroyed its nest. The 1988 EIS does not address these endangered species correctly, if at all.

BWS needs to write an SEIS to consider additional factors influencing the feasibility of its water plan. Additional constraints on developable yields from Windward groundwater resources may cause BWS to invest in water resources that are not feasible or cost-efective. Because the Auloa project is a mere segment of the entire planned project, indirect effects of this segment are direct effects of the entire project. Whether one considers this segment and its indirect effects or the entire project and its direct effects, the significant effects are the same. The 1988 EIS did not consider all the significant effects of the Windward dewatering plan.

Ilima Morrison
985 Lunahelu Street
Kailua, Hawaii 96734

cc: OEQC

A

COMMISSION ON WATER RESOURCE MANAGEMENT
WINDWARD OAHU GROUND WATER AQUIFER SYSTEMS

WINDWARD AQUIFER SYSTEM	SUSTAINABLE YIELD (MGD)	DEVELOPABLE YIELD (MGD)	1990 AVERAGE WATER USE WATER USE (MGD)	1990 AVERAGE WATER USE % OF SUSTAINABLE YIELD	1990 AVERAGE WATER USE % OF DEVELOPABLE YIELD	AV WA (MG
Kawailoa (North)	12.5	12.5	0.8	6.6%	6.6%	11.7
Koolauloa	35.0	35.0	13.7	39.1	39.1	21.3
Kahana[1,2,3]	13.0	0.1	0.1	1.1	100.0	0'
Koolaupoko[1,2]	43.0	13.7	13.7	31.9	100.0	0'
Waimanalo[1]	8.0	0.9	0.9	11.6	100.0	0'
TOTAL	111.5	62.2	29.3	26.3%	47.1%	33.(

[1]Water not directly available due to possible interaction between ground water and streams.

[2]Proposed Makalii aquifer unit is a portion of Kahana aquifer system's sustainable yield.

[3]Excludes approximately 25 mgd from Waiahole Tunnel, which is accounted for in the Pearl Harbor aquifer sector irrigation r

Attachment D

HO

BOARD OF WATER SUPPLY

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

COPY

May 7, 1998

MAY 12 1998

Ms. Ilima Morrison
985 Lunahelu Street
Kailua, Hawaii 96734

Dear Ms. Morrison:

Subject: Your Letter of March 20, 1998 Regarding the Draft Environmental Assessment (EA) for the Board of Water Supply's Proposed Auloa Road 16-Inch Waterline Project, Maunawili, Oahu, TMK: 4-2-14:13

Thank you for reviewing the Draft EA for the proposed Auloa Road 16-inch waterline project. We provide the following response to clarify the purpose of the pipeline replacement project and also to address your concerns on stream flow impacts and water rights:

1. The existing pipeline is being relocated to the Auloa Road right-of-way to increase the water service reliability to the upper Maunawili Valley. The existing pipeline is located within a forested area which is extremely difficult to access and repair. A recent main break on this line has reinforced the difficulty in finding and repairing the main break. Our facility replacement program takes a proactive approach to replace facilities early enough to minimize service disruptions. This program is funded by our water rates from islandwide users; therefore, system upgrades are programmed evenly throughout the island.

2. The pipeline size is being increased from 12 inches to 16 inches because pipeline velocities are high due to the small diameter size. The high velocities coupled with the normally high pressures of the Windward 500' system, create in stresses in the pipeline and causing more frequent main breaks.

3. The Auloa Road main is part of the Windward 500' high service transmission system providing local service to portions of the Koolaupoko district between the 172-foot and 400-foot elevations, including the upper Maunawili Valley Community. The windward 500' system is a local distribution system for the higher elevations, extending from Kahaluu to Maunawili. The regional transmission system is the 272' low service water system, not the 500' system.

4. We note your concerns regarding Hawaiian and constitutional water rights for surface water. We feel these water rights for surface water are being maintained as long as our groundwater source development does not affect surface water. All exploratory wells are test pumped following standard test pumping protocol and streams are gauged to monitor any stream flow effects. If surface water is affected, an amendment to the instream flow standards is required, where the CWRM weighs the impacts and benefits of instream and noninstream uses. The instream flow standards amendment process and the water use permit process are where beneficial uses of water are evaluated in the context of environmental impact, islandwide water availability and consistency with County land use plans. Those sources impacting surface water before passage of interim instream flow standards are considered permitted diversions.

5. We disagree with the regional generalization that there is a "one-to-one" relationship between groundwater and surface water in the Waimanalo, Koolaupoko and Kahana aquifers. With the exception of sources in Waihee Valley, no Board of Water Supply (BWS) sources in Windward Oahu have been shown to measurably affect stream flows. Stream flow in the lower reaches of these watersheds are perched upon thick sediments, such that groundwater withdrawals will not affect stream flows. Evidence of thick sedimentation is confirmed by well logs of existing and exploratory wells and the lack of impact from these well upon gaged stream flows.

   We feel our Windward Regional Water System Improvements Environmental Impact Statement adequately discloses our source development plans, the associated withdrawal impacts and our regional water transmission plans. In addition, site specific environmental assessments are also conducted for each individual project, as is the case with this project.

In light of the water code's comprehensive regulatory process and the extensive environmental disclosure process, which BWS diligently follows, we do not feel a supplemental environmental impact statement is necessary at this time.

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: Brian Takeda, R.M. Towill Corporation

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APPENDIX

Archaeological Reconnaissance Survey

ARCHAEOLOGICAL AND HISTORICAL ASSESSMENT AND FIELD INSPECTION OF A 0.8-MILE LONG PORTION OF THE AULOA ROAD RIGHT-OF-WAY IN THE *AHUPUA'A* OF KAILUA, KO'OLAUPOKO DISTRICT, ISLAND OF O'AHU

by

Hallett H. Hammatt, Ph.D.
and
Rodney Chiogioji, B.A.

Prepared for

R.M. TOWILL CORPORATION

CULTURAL SURVEYS HAWAII
October 1997

ABSTRACT

At the request of R.M. Towill Corporation, Cultural Surveys Hawaii has completed an archaeological and historical assessment, and field inspection of an approximately 0.8 mile long and 50-foot wide portion of the Auloa Road right-of-way in the *ahupua'a* of Kailua. This section of the right-of-way is proposed for installation of a 16-inch water line.

The portion of the Auloa Road right-of-way under study was constructed sometime in the late 19th or early 20th century. Field inspection ascertained that construction of the right-of-way involved extensive excavation along the side of a ridge. No surface archaeological sites or evidence of possible subsurface archaeological deposits were observed during the field inspection.

No further archaeological investigation is recommended. No on-site or on-call monitoring is justified during future construction activities.

However, planners of future installation work should be made aware of two historic-era structures at Castle Junction adjacent to the study area: the Kaneohe Ranch office building (State site 50-80-10-1360) and a war memorial monument.

Additionally, an apparent Southeast Asian "shrine" area has been created at the base of a banyan tree at the hairpin turn within the present Auloa Road study area. Planners of future installation work should be made aware of its presence.

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I. INTRODUCTION

A. Project Area Description

At the request of R.M. Towill Corporation, Cultural Surveys Hawaii has completed an archaeological and historical assessment, and field inspection of an approximately 0.8 mile long and 50-foot wide portion of the Auloa Road right-of-way in the *ahupua'a* of Kailua, Ko'olaupoko District, on the island of O'ahu (Figures 1 & 2). The portion of the Auloa Road right-of-way under study commences at Castle Junction where Auloa Road joins the Pali Highway, Kalanianaole Highway, and Kamehameha Highway. The Auloa Road study area meanders to the east and terminates 700 feet west of fire hydrant W-757 on Auloa Road. This section of the right-of-way is proposed for installation of a 16-inch water line.

B. Scope of Work

The scope of work comprised:

1. Historical research to include study of archival sources, historic maps, Land Commission Awards and other relevant information to construct a history of land use for this particular parcel.

2. Field inspection of the road project area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites to determine if they are of pre-historic or historic nature. This assessment will identify any sensitive areas that may require further investigation or mitigation before the water line installation project proceeds.

3. Preparation of a report to include the results of the historical research and the fieldwork with an assessment of archaeological potential based on that research, with recommendations for further archaeological work, if appropriate. It will also provide mitigation recommendations if there are archaeologically sensitive areas that need to be taken into consideration.

C. Work Accomplished

Field inspection was conducted on September 19, and October 2, 1997. The portion of the Auloa Road right-of-way was traversed on foot. Findings were documented by field notes and photographs.

Background research included: a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources; review of documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Mission Houses Museum Library, the Hawai'i Public Library, and the Archives of the Bishop Museum; study of historic photographs at the Hawai'i State Archives and the Archives of the Bishop Museum; and study of historic maps at the Survey Office of the Department of Land and Natural Resources.

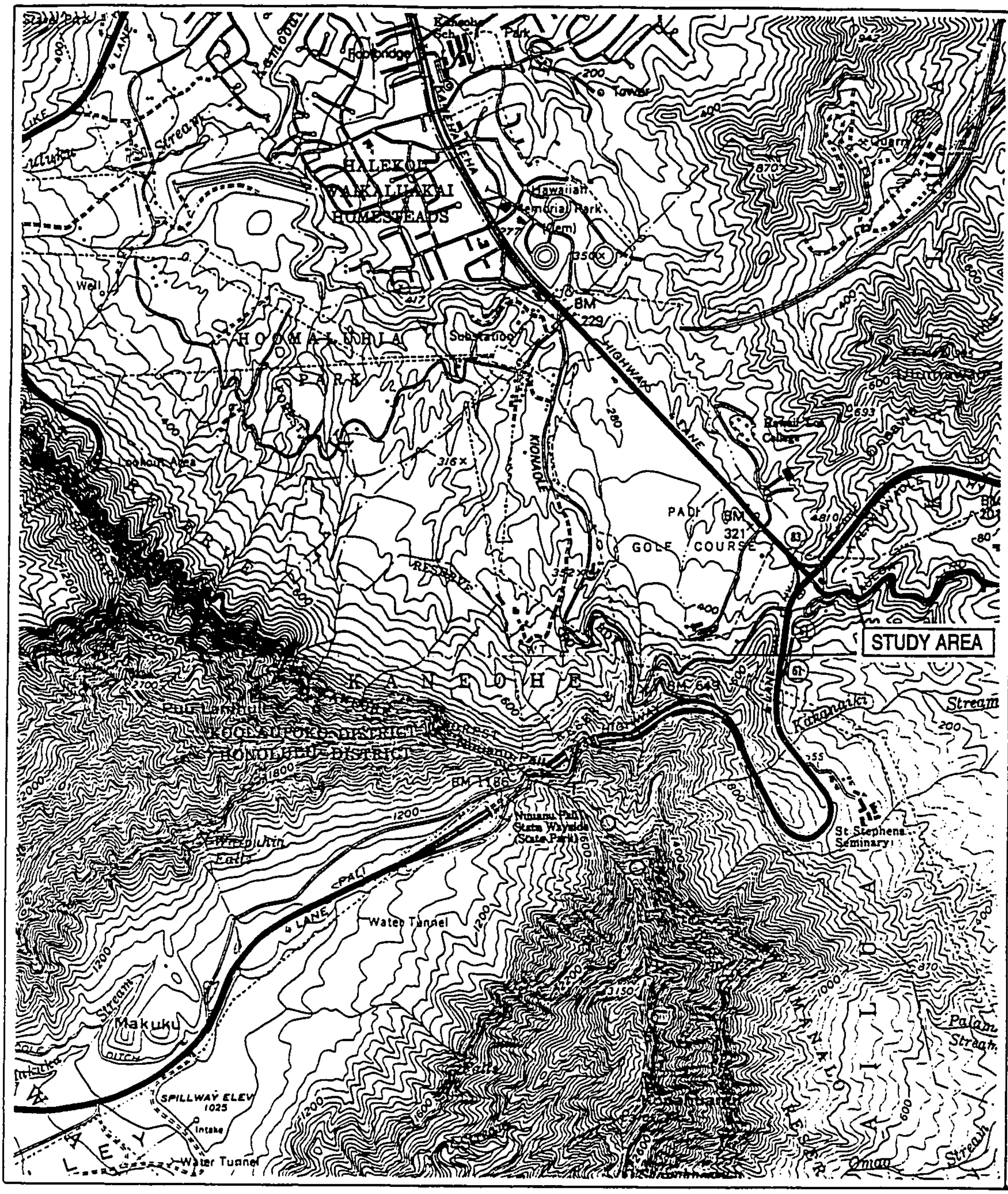

Figure 1 Portions of USGS 7.5 Minute Series Topographical Map, Honolulu and Kaneohe Quadrangles, showing Auloa Road study area

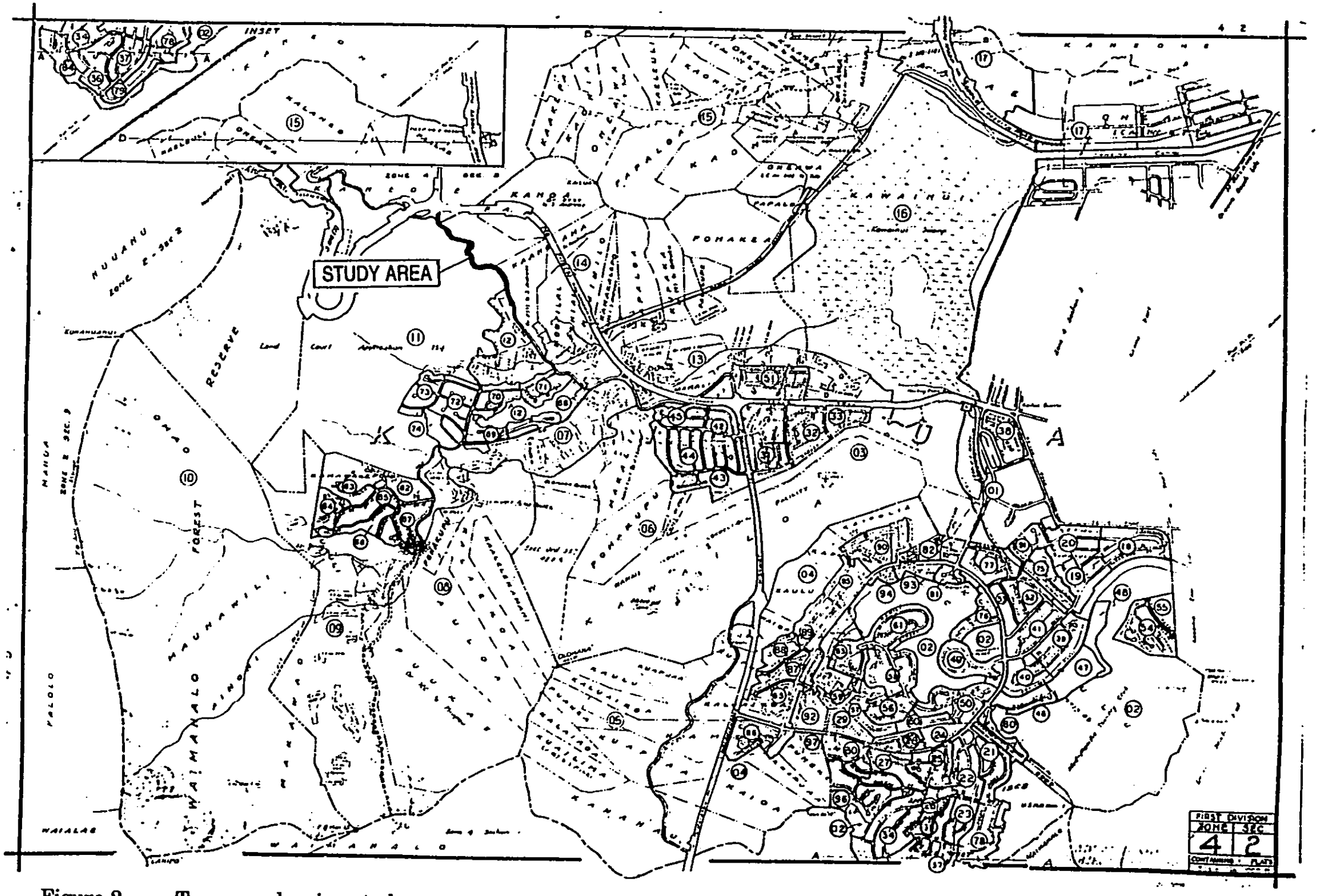

Figure 2 Tax map showing study area

II. ARCHAEOLOGICAL AND HISTORICAL DOCUMENTATION

A. Kailua *Ahupua'a*

The Auloa Road right-of-way is located near the base of the Ko'olau mountain range in the *mauka* reaches of Kailua *ahupua'a* in the traditional district of Ko'olaupoko. Little is known of traditional land tenure in Kailua *ahupua'a*. O'ahu was conquered by the Maui chief Kahekili in 1783 and again by Kamehameha in 1795, and it was the custom of ruling chiefs to disregard the land allocations of their defeated rivals. In an early account of Kamehameha's land allocations on O'ahu (I'i 1959:69-70), Kailua is not mentioned and it has been assumed (*e.g.* Shun *et al.* 1987:12) that Kamehameha retained the *ahupua'a* for his lineage. The pioneering 19th-century Hawaiian historian Samuel Kamakau, recorded that Kamehameha even labored in Kawainui marsh, which was then a fishpond:

> While [Kamehameha] lived on Oahu he encouraged the chiefs and commoners to raise food and he went fishing and would work himself at carrying rock or timber...He worked at the fishponds at Ka-wai-nui, Ka-'ele-pulu, Uko'a, Mauna-lua, and all about Oahu. (Kamakau 1992:192)

Evidence that Kailua was retained by Kamehameha is suggested in records for the mid-19th century *Mahele*. The Organic Acts of 1845 and 1846 initiated the process of the *mahele* - the division of Hawaiian lands - which introduced private property into Hawaiian society. In 1848 the crown and the *ali'i* (royalty) received their land titles. The common people received their *kuleana* (individual parcels) in 1850. Kailua was claimed by Queen Hazaleleponi Kalama Kapakuhaili, wife of Kamehameha III. No Land Commission Awards (LCAs) for *kuleana* were located in the immediate vicinity of the present project area.

Studies in the Ko'olaupoko District (Chun 1954; Miyagi 1963; Kelly and Clark 1980; and Allen-Wheeler 1987) indicate that the vast majority of *kuleana* within the windward *ahupua'a* were located along main streams and lowlands where crops could be easily irrigated with *'auwai* (irrigation canals). Hawaiian settlement would be focused in these areas. The present Auloa Road right-of-way - cut along a ridge at the base of the Ko'olau range - would not have been ideal for cultivation. In the following account of the general vicinity in the mid-1840s the lack of occupation in the area is noted:

> ...(From foot of Pali) Thence the road passed through a dense coppice of Pandanus trees laden with large fruits and beautiful male flowers in long sheaths. From this coppice we came out into the open fields, which bore only slight traces of habitation and human industry. (Then talks about cattle) Along the entire remainder of the road, I suppose a stretch of about 3/4 mile, I discerned only a single hut and a few holes made in the ground for the taro...(Bille IN Sterling and Summers 1978:205)

In the absence of data on traditional occupation and cultivation in the general area of the present Auloa Road corridor, it appears that the primary importance of the area was its association with the trail system of the Ko'olaupoko District.

B. Auloa Road Corridor

The origins of the present Auloa Road corridor may be found in the development of the route over the Nu'uanu Pali connecting the *ahupua'a* of the Ko'olaupoko District to Honolulu and leeward O'ahu.

The Ko'olau range formed a major barrier to human interchange across the island of O'ahu. In ancient Hawai'i there were a number of options for travel from one side of the Ko'olau mountains to the other. Travel by foot along the coast or by canoe required several days. A number of trails - including the Laie Trail and the old "Castle Trail" alignments - ran from the northern windward district of Ko'olauloa across to Waialua or Wai'anae uka (Wahiawa). However, the central valley was sparsely populated and there was likely not much traffic on these more northerly trans-Ko'olau trails. There was far more reason for people to cross between the rich *ahupua'a* of the southern windward Ko'olaupoko District and the Kona District ('Ewa and Honolulu).

Two main routes ran overland from Ko'olaupoko to Honolulu: one at Kalihi and the other at Nu'uanu. The Kalihi pass was more precipitous, requiring the use of ropes and ladders (Byron IN Sterling and Summers 1978:225). The Nu'uanu pass trail was preferred in late traditional Hawaiian times. However, it too could be treacherous. The trail alignment ascended up the floor of Nu'uanu Valley to the "*nuku* of Nu'uanu" or major declivity just west of the present Nu'uanu Pali State Wayside Park overlook. The trail then hugged the windward side of the Ko'olau(s) for about 300 yards until it reached the first major spur to the north at which it "careened down at a breakneck angle" (Devaney *et al.* 1982:163). One of the earliest accounts of the trail down Nu'uanu Pali to windward O'ahu described the route in 1825:

> We next prepared for our descent. The path leads down this steep and dangerous but beautiful precipice amongst innumerable trees and bushes thriving in every crevice of the rocks. In one spot an almost perpendicular descent of thirty feet down small projecting ledges of the rock, worn smooth by the bare feet of the natives, obliged us for our own safety, to give our guns and other things we had with us to the natives to pass them down, while we pulled off shoes and stockings to prevent our slipping as one false step might have been fatal. (Bloxam IN Sterling and Summers 1978:225)

The crude trail up the Pali would undergo improvements throughout the first half of the 19th century. During the 1830s, steps were carved along the more precipitous sections and iron railings were installed. As commercial interests promoted the growth of windward O'ahu, the Hawaiian government authorized, in the early 1840s, the paving of sections of the trail with stones and boulders to make the route accessible on horseback. The newly-paved route was officially opened on June 28, 1845 when Kamehameha III and his entourage rode down and back up the trail. During the 1850s, the route was further improved to accommodate carriages. No additional improvements or re-alignments were made to the trail until the last decade of the 19th century.

None of the early 19th-century accounts of the trail over the Nu'uanu Pali describe in detail the trail's course once it descended to the windward plain below the Ko'olau Range. However, two maps generated during the 1870s and 1880s delineate the Ko'olaupoko trail system that joined the Pali trail. A government map of west Kailua, surveyed by C.J. Lyons in 1874 and drawn by W.D. Alexander in 1876, shows the "Nuuanu Road" ascending over the Pali where it winds down the windward side of the Ko'olau range where the road forks, one branch leading toward Kane'ohe and the other branch turning east where it is identified on the map as the "main road to Kailua and Waimanalo" as it enters the *'ili* of Malamalama (Figure 3). The second map, copied from an old map by A. Bishop in 1888 and redrawn by R.D. King in 1900, shows continuation of the main road to Kailua and Waimanalo as it crosses Malamalama *'ili* toward Waimanalo (Figure 4).

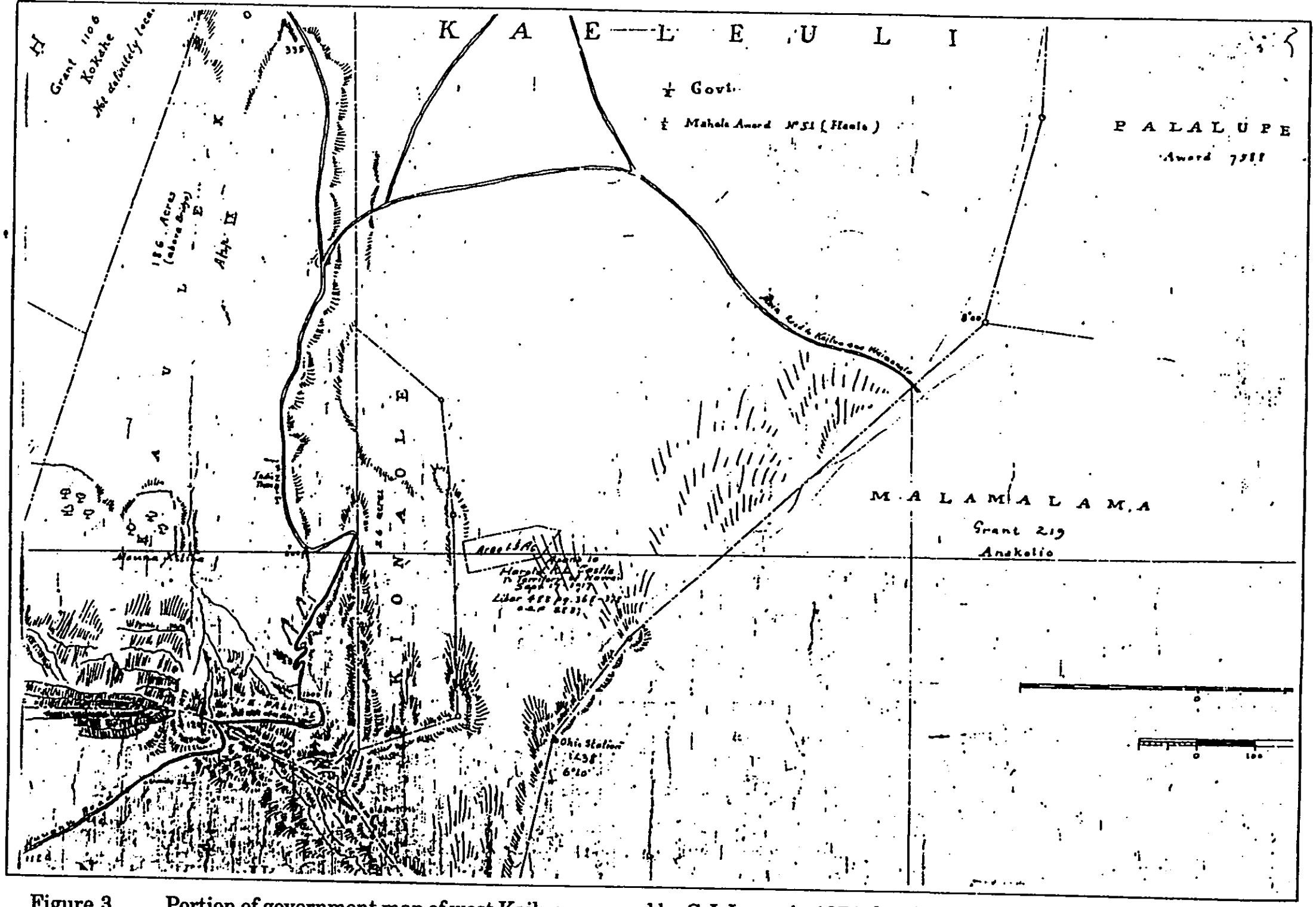

Figure 3 Portion of government map of west Kailua surveyed by C.J. Lyons in 1874 showing Nu'uanu Pali trail and Ko'olaupoko district trail system

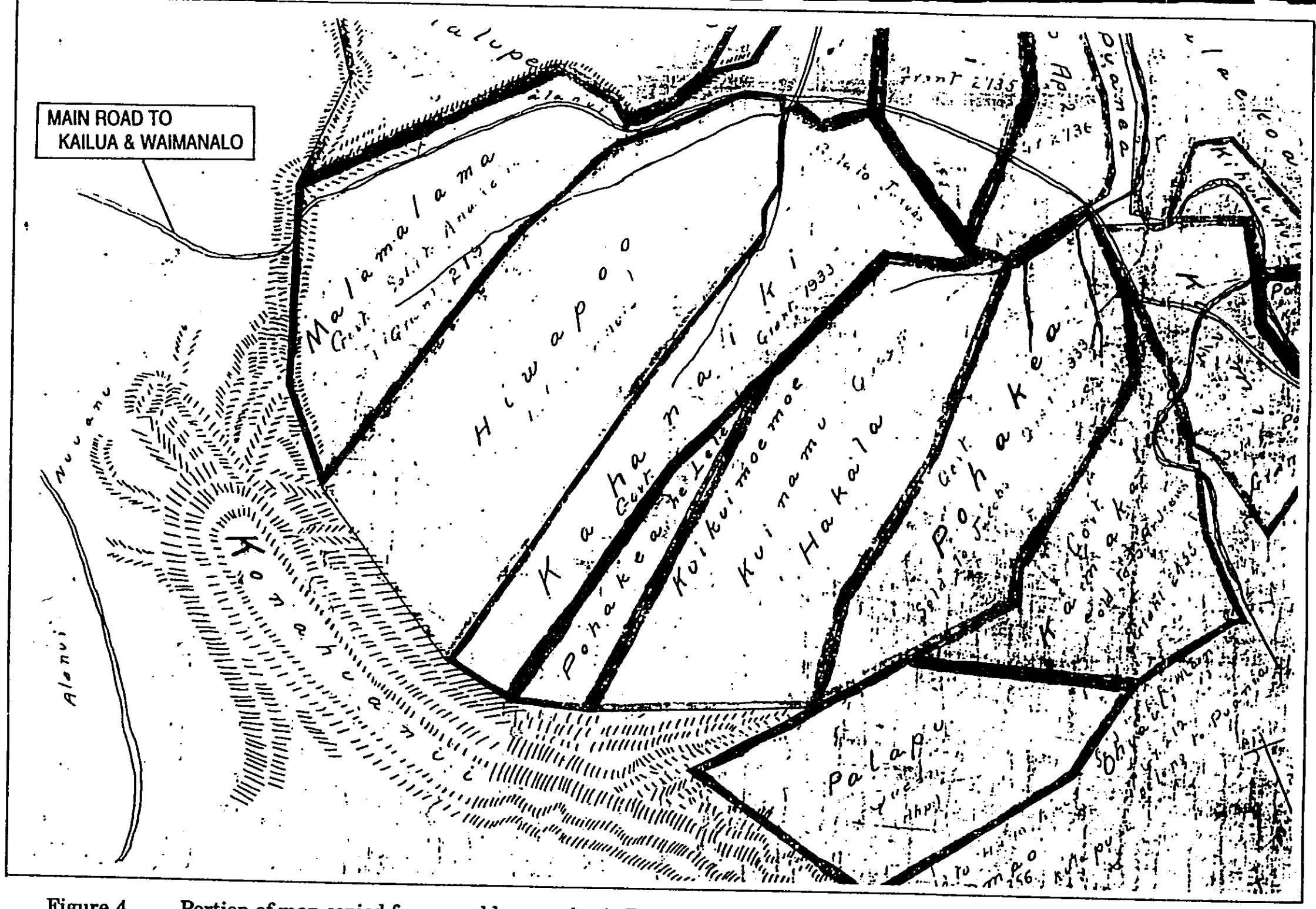

Figure 4 Portion of map copied from an older map by A. Bishop in 1888 showing route of main road to Kailua and Waimanalo

The two maps indicate that upon entering the Ko'olaupoko District the main branch of the Pali trail tended due north, probably just west of Kahuaiki Stream and roughly parallel to the western portion of the present Kionaole Road which runs up the east side of Kahuaiki Stream. On the map surveyed by Lyons in 1874 this route is identified as "approx. course of road Honolulu to Makaha"; it continues north to a swampy area around the mouths of Kawa and Kane'ohe streams. A spur trail branched off to the east crossing Kahuaiki Stream and then branching in two with the northeast fork lying roughly along the present H-3 alignment out towards Mokapu Headland, and the east fork tending back toward the south on its way to Waimanalo. This east fork, the "main road to Kailua and Waimanalo", ran roughly east, just south of the eastern portion of Kamehameha Highway (*i.e. mauka* of the present Auloa Road study area) and then continued running roughly parallel to and just north of the north fork of Kahanaiki Stream and crossing Kahanaiki Stream just downstream from the confluence of the north and south forks of Kahanaiki Stream.

None of the main road or trail alignments shown on the two maps correspond to the configuration or location of the present Auloa Road.

During the last quarter of the 19th century, business and political interests pressured for construction of a safer, less precipitous and smoother road over the Pali. In 1896, the Legislature appropriated $40,000 for a new Pali Road. Construction was completed on January 6, 1898, creating a new Pali Road, 7,620-feet long, cut into the side of the Ko'olau Range with 17,500 pounds of blasting powder and 10,000 pounds of dynamite.

The construction of the new Pali Road impelled the development of new roadways across windward O'ahu. The present Auloa Road alignment appears on two maps from the 1920s. A 1922 "Fire Control Map" (Figure 5), based on a topographic survey between 1908 and 1913, shows the new Pali Road alignment feeding into the present Auloa Road alignment which has supplanted the "main road to Kailua and Waimanalo" indicated on the 1880s map. A 1920 map of existing and proposed "Kailua & Waimanalo Roads" shows the present Auloa Road alignment as a segment of the "present Waimanalo Road" (Figure 6). The map notes that the road was of "concrete and asphalt macadam construction". The map also shows that new routes into Kailua and out to Waimanalo were already in the planning stage.

Additional maps and documents from subsequent decades indicate that the present Auloa Road right-of-way was originally named the "Kalanianaole Highway" in honor of Prince Jonah Kūhiō Kalaniana'ole (1871-1922).

In the early 1950s, work commenced on an 8.3-mile long Nuuanu Pali Highway and Tunnel project. The project was completed on January 3, 1961. During this same period leeward and windward approach roads to the Pali tunnels were straightened. The creation of the new Kalanianaole Highway segment between Castle Junction and Castle Hospital enabled the bypassing of the winding former "Kalanianaole Highway" route which was renamed Auloa Road, apparently referring to Hō'auloa, a land section of O'ahu (Budnick 1989:30). Auloa Road continues in use as a route into the Maunawili area.

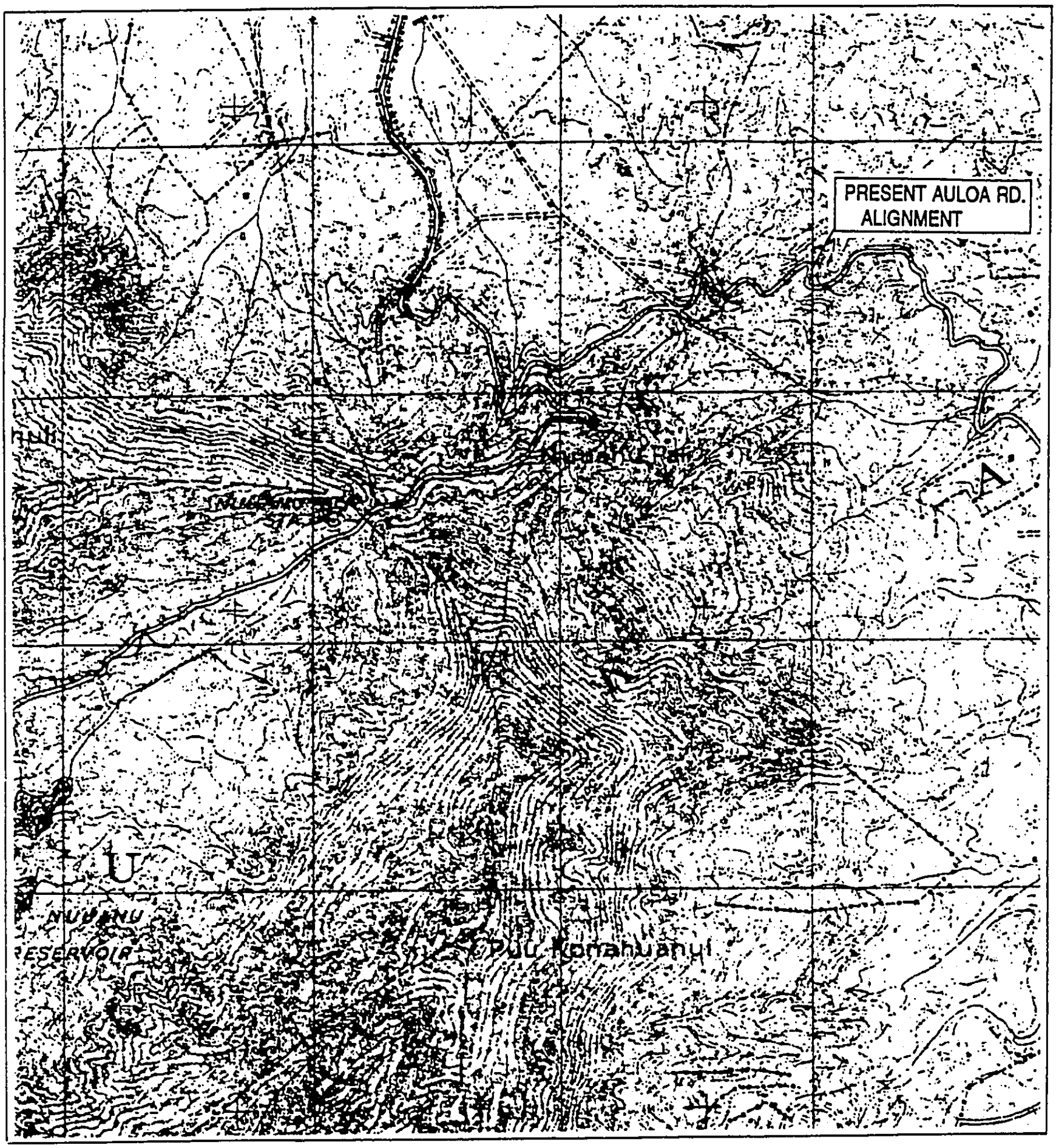

Figure 5 Portion of 1922 Fire control Map showing new Pali Road alignment and new road alignment (present Auloa Road) into Kailua and Waimanalo

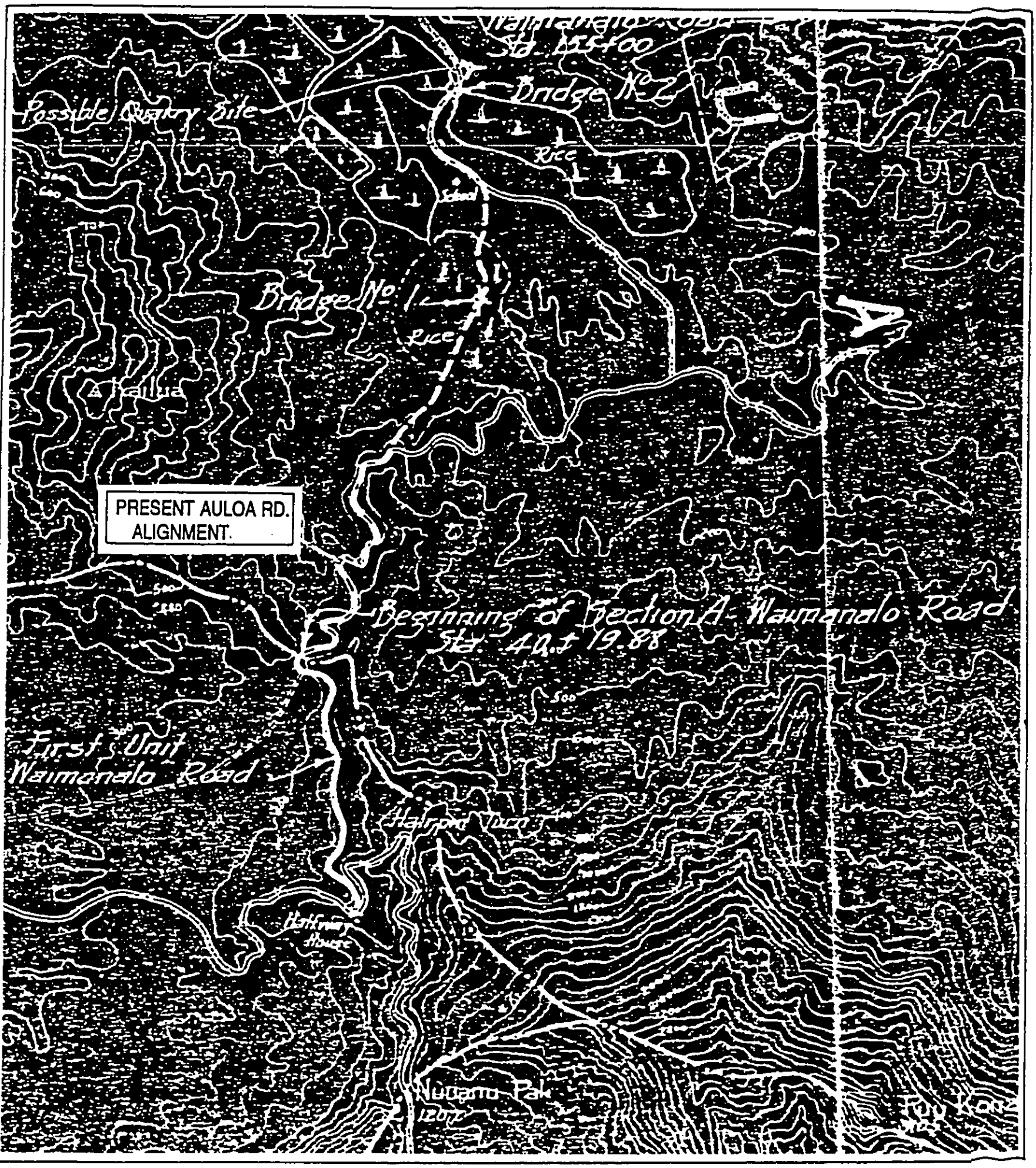

Figure 6 Portion of 1920 Office of the City & County (Honolulu) Engineer map of "Kailua & Waimanalo Roads" showing present Auloa Road alignment as segment of the "present Waimanalo Road"

III. FIELD INSPECTION RESULTS

Field inspection was conducted on September 19, and October 2, 1997. The present study portion of the Auloa Road right-of-way was traversed on foot (Figures 7-9).

The right-of-way was observed to comprise almost entirely of a deep cut along the side of a ridge (Figures 10 & 11). Portions of the right-of-way, on the downslope side of the cut, consist of fill retained by cement walls (Figure 12). The roadway itself is constructed of asphalt over cement (Figure 13).

No surface archaeological sites were observed within the Auloa Road right-of-way itself or in areas immediately adjacent to the right-of-way. The extensive excavation of the ridge to create the level road surface precludes the likelihood of any subsurface archaeological deposit directly beneath the right-of-way.

The only structures of historical interest in the near vicinity of the right-of-way are located at Castle Junction. On the *makai* side of Auloa Road, the Kaneohe Ranch office building - constructed in 1941 - was placed on the State and National Registers of Historic Places in 1983 as site number 50-80-10-1360 (Figure 14). On the opposite side of Auloa Road is a large, upright boulder which is a war memorial monument erected in 1946 (Figure 15).

Also observed during the field inspection was an apparent "shrine" area that has been created at the base of a banyan tree located at the hairpin turn of Auloa Road within the present study area (Figures 16 & 17). The shrine consists of ribbons, food offerings, incense sticks, paper money, flowers and paper flowers placed on the trunk and between the roots of the banyan, generally on the side hidden from the road. The shrine is likely a Southeast Asian, presumably Laotian, expression of religiosity that has been set up within the last ten years or so, probably by members of a local immigrant community.

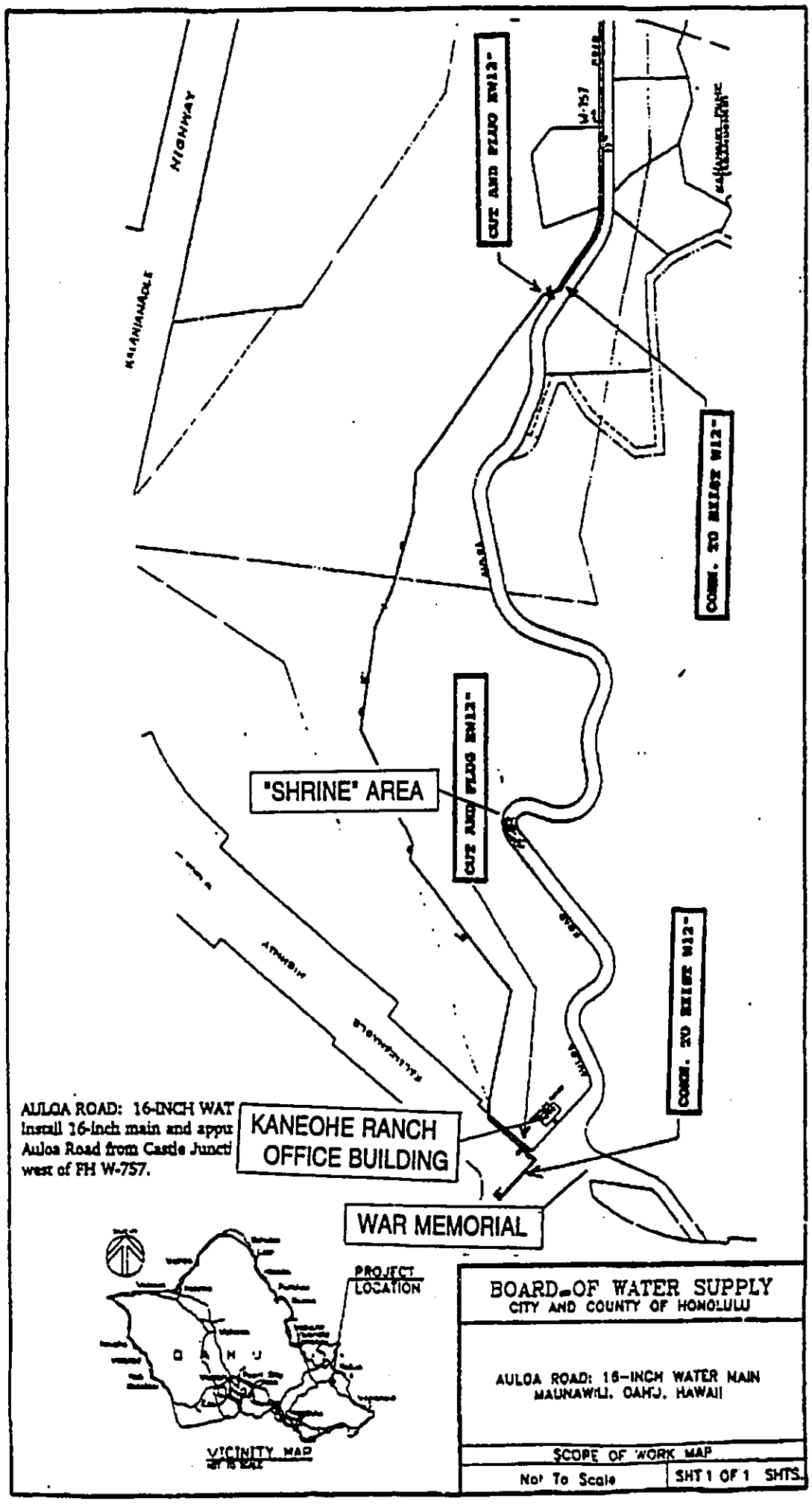

Figure 7 Auloa Road right-of-way study area showing locations of Kaneohe Ranch office building, war memorial monument, and Southeast Asian "shrine" area.

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Figure 8 West end of Auloa Road right-of-way study area at Castle Junction; view east

Figure 9 East end of Auloa road right-of-way study area; view northwest

Figure 10 Central portion of Auloa Road right-of-way study area showing cut in ridge to create road alignment; view northeast

Figure 11 Curve in western portion of Auloa Road right-of-way study area showing cut through ridge on both sides of right-of-way; view west

Figure 12 Cement retaining wall alongside Auloa Road right-of-way in eastern portion of study area; view east

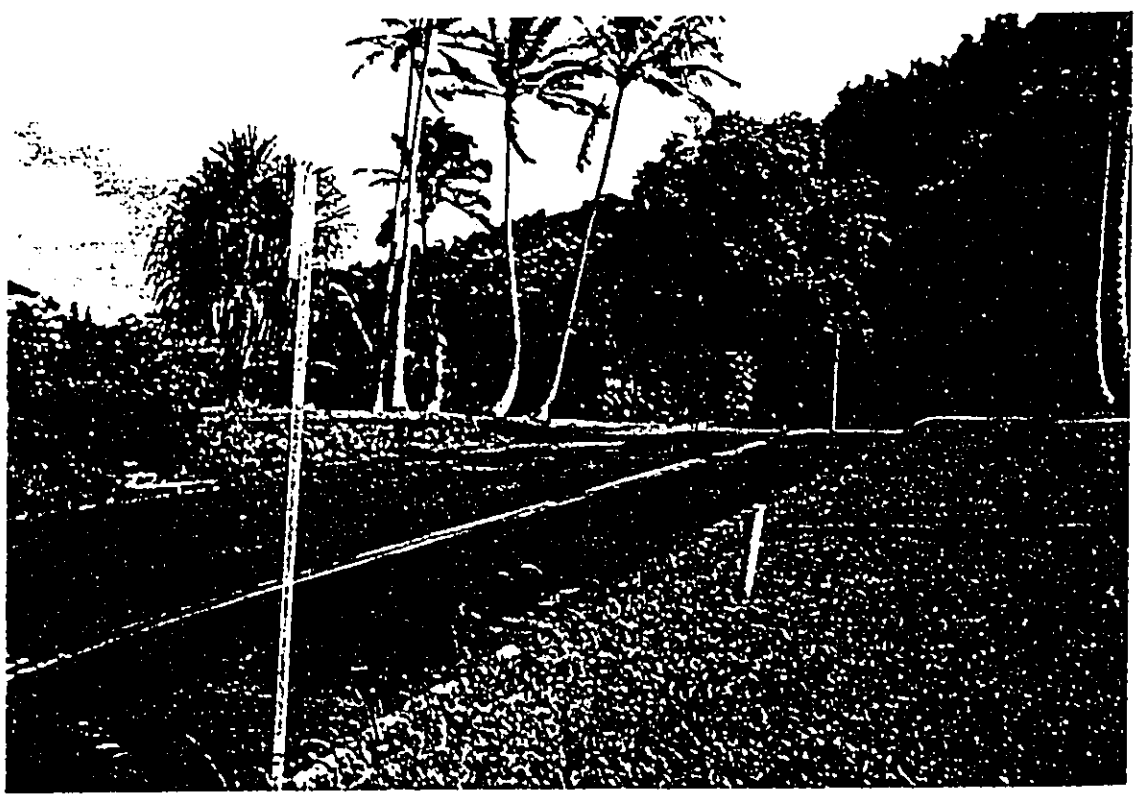

Figure 13 Asphalt over cement surface of Auloa Road right-of-way at Castle Junction; view east

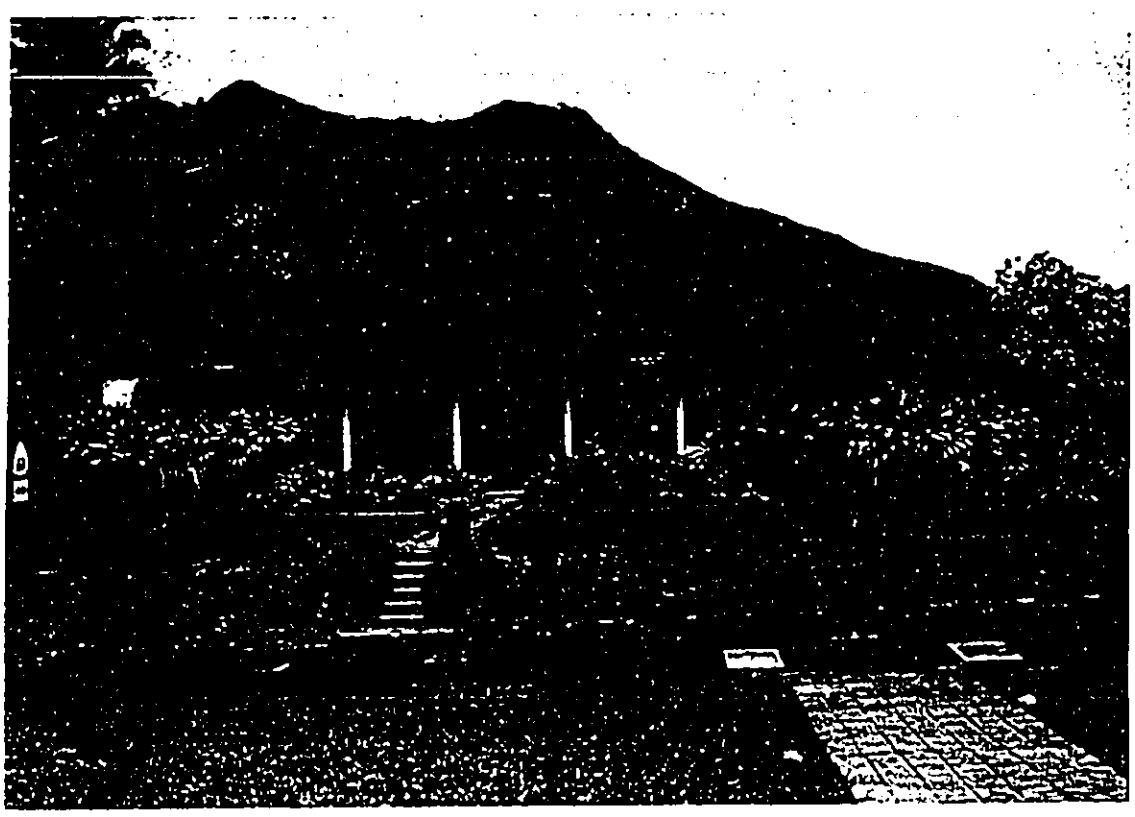

Figure 14 Kaneohe Ranch office building at Castle Junction; view northeast

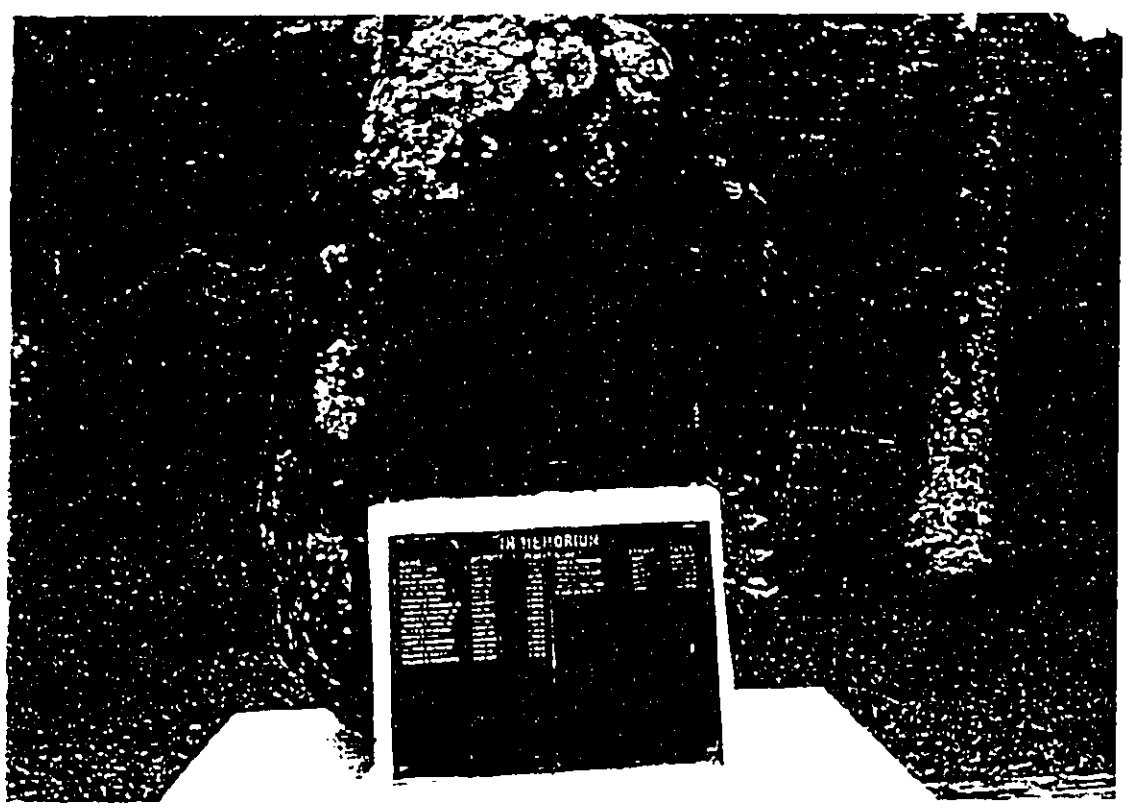

Figure 15 1946 war memorial boulder and plaques at Castle Junction (opposite Kaneohe Ranch office building); view southwest

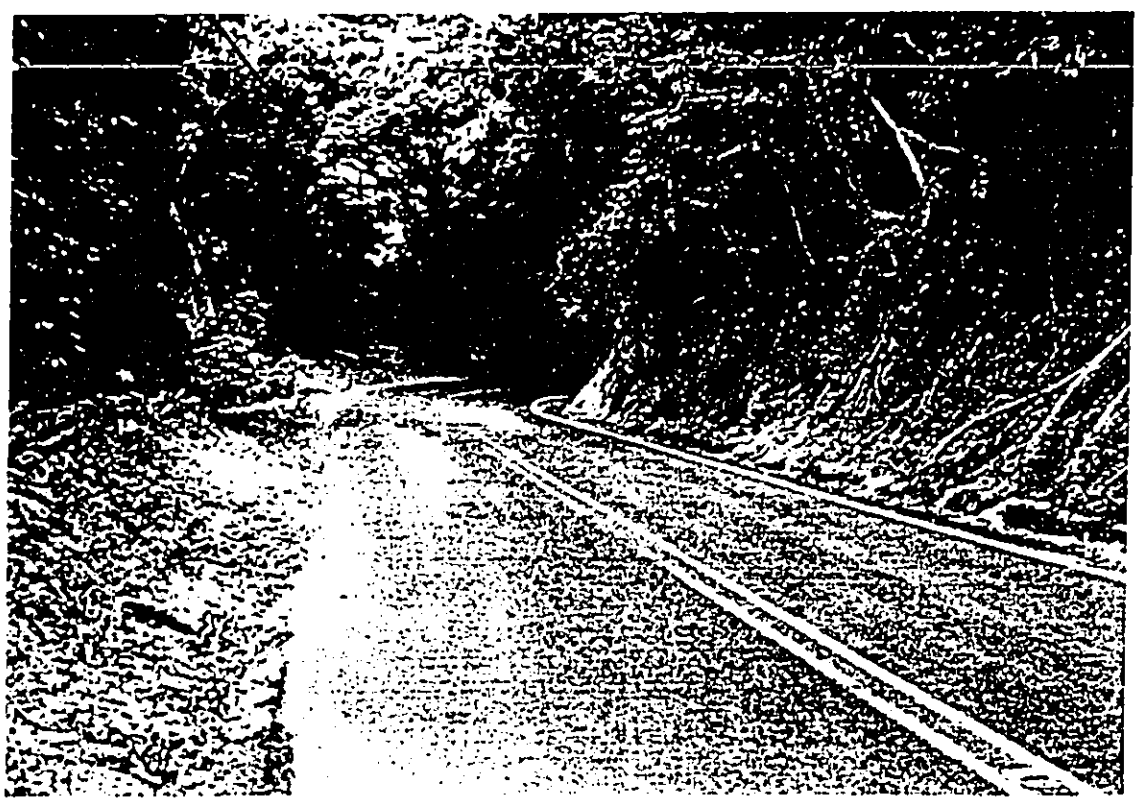

Figure 16 Hairpin turn of Auloa Road right-of-way showing banyan tree (site of "shrine" area) in center; view northeast

Figure 17 "Shrine" area at base of banyan tree at Auloa Road hairpin turn; view southeast

IV. SUMMARY AND RECOMMENDATIONS

A. Summary

The portion of the Auloa Road right-of-way under study was constructed sometime in the late 19th or early 20th century, likely in association with the development of the * Pali Road improvements which commenced in 1897. Historic maps of the early 20th century identify the route of the present Auloa Road as the "Main Government Road." By the 1920s, the road is identified on maps as the "Kalanianaole Highway". Subsequently, during the 1960s, with the construction of the Pali tunnels, a new Kalanianaole Highway segment between Castle Junction and the present Castle Hospital supplanted the right-of-way which was then renamed Auloa Road.

The field inspection of the study area confirmed the absence of surface archaeological sites within the right-of-way study area which, along almost all of its length, comprises a deep cut into the side of a ridge. The only observed historic-era structures in the near vicinity of the study area were, at Castle Junction, the Kaneohe Ranch office building (State site 50-80-10-1360) and a war memorial monument.

Also observed were the evidences of an apparent Southeast Asian "shrine" area created at the base of a banyan tree at the hairpin turn within the present Auloa Road right-of-way under study. The shrine area appears to have been put into use within the last ten years.

B. Recommendations

Based on the absence of archaeological and historic sites within the portion of the Auloa Road right-of-way under study, no further archaeological investigation is recommended. Additionally, based on the extensive excavation for the Auloa Road alignment and on the unlikelihood of any subsurface archaeological deposits, on-site or on-call monitoring is not justified during future construction activities. However, if findings are encountered during ground disturbing activities, work should be halted in the immediate area and the State Historic Preservation Division of the Department of Land and Natural Resources should be contacted.

The Auloa Road right-of-way does not directly impact the adjacent structures at Castle Junction - the Kaneohe Ranch office building and the war memorial monument. Future installation work near these structures should take into account their proximity.

As it is clearly less than fifty years old, the "shrine" created at the banyan tree along the right-of-way does not constitute an historical or archaeological site. However, planners of future installation work should be made aware of its presence.

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