



DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
COUNTY OF MAUI

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94 DEC 27 AM 6:03

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OFFICE OF
QUALITY CONTROL December 27, 1994

Director
Office of Environmental
Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

SUBJECT: Proposed Hale Makua Kahului Expansion
TMK (2)3-8-7:por.97

Dear Sir:

In accordance with the requirements of Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, a Final Environmental Assessment has been prepared for the subject project.

Notice of availability of the Draft Environmental Assessment for the project was published in the November 23, and December 8, 1994 OEQC Bulletins. No letters were received during the public comment period, which ended December 23, 1994.

As the accepting agency, we are forwarding herewith one (1) copy of the OEQC Bulletin Publication Form, and four (4) copies of the Final Environmental Assessment. We have determined that there will be no significant impacts as a result of the project and, therefore, are filing the Final Environmental Assessment as a negative declaration. We respectfully request that the notice of Final Environmental Assessment be published in the OEQC Bulletin.

Very truly yours,

Stephanie Aveiro
Director of Housing and Human
Concerns

SA:llt
Attachments
cc: Tony Kreig, Hale Makua
hmkua.001.1e29

Housing Division

Senior Services Division

Youth Services Division

Immigrant Services

Office on Aging

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1995-01-08-MA-FAA-Hale Makua Kahului
Expansion

JAN 8 1995

**Final
Environmental Assessment**

Hale Makua Kahului Expansion

Prepared for

December 1994

Hale Makua



Final
Environmental Assessment

Hale Makuu Kahului Expansion

Prepared for

Hale Makuu

December 1994



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Preface

Hale Makua, a non-profit health care organization, proposes to expand its existing facility by constructing a new patient care building which will accommodate an additional 118 beds and a new 60-stall parking lot in Kahului, Maui, Hawaii (TMK 3-8-7:por.97). Pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, Environmental Impact Statement Rules, this Final Environmental Assessment (EA) documents the project's technical characteristics and environmental impacts, and advances findings and conclusions relative to the significance of the project.

Chapter 1

Project Overview

I. PROJECT OVERVIEW

A. PROPERTY LOCATION, EXISTING USE, AND LAND OWNERSHIP

Hale Makua, a non-profit health care organization, proposes to expand its existing Kahului facility by constructing a new patient care building which will be designed to accommodate an additional 118 beds. A 60-stall parking lot will also be constructed to address anticipated additional parking demands of the proposed expansion. Related site work would include grading, utilities installation and landscaping. The proposed building expansion will be integrated with the existing 120-bed Kahului facility.

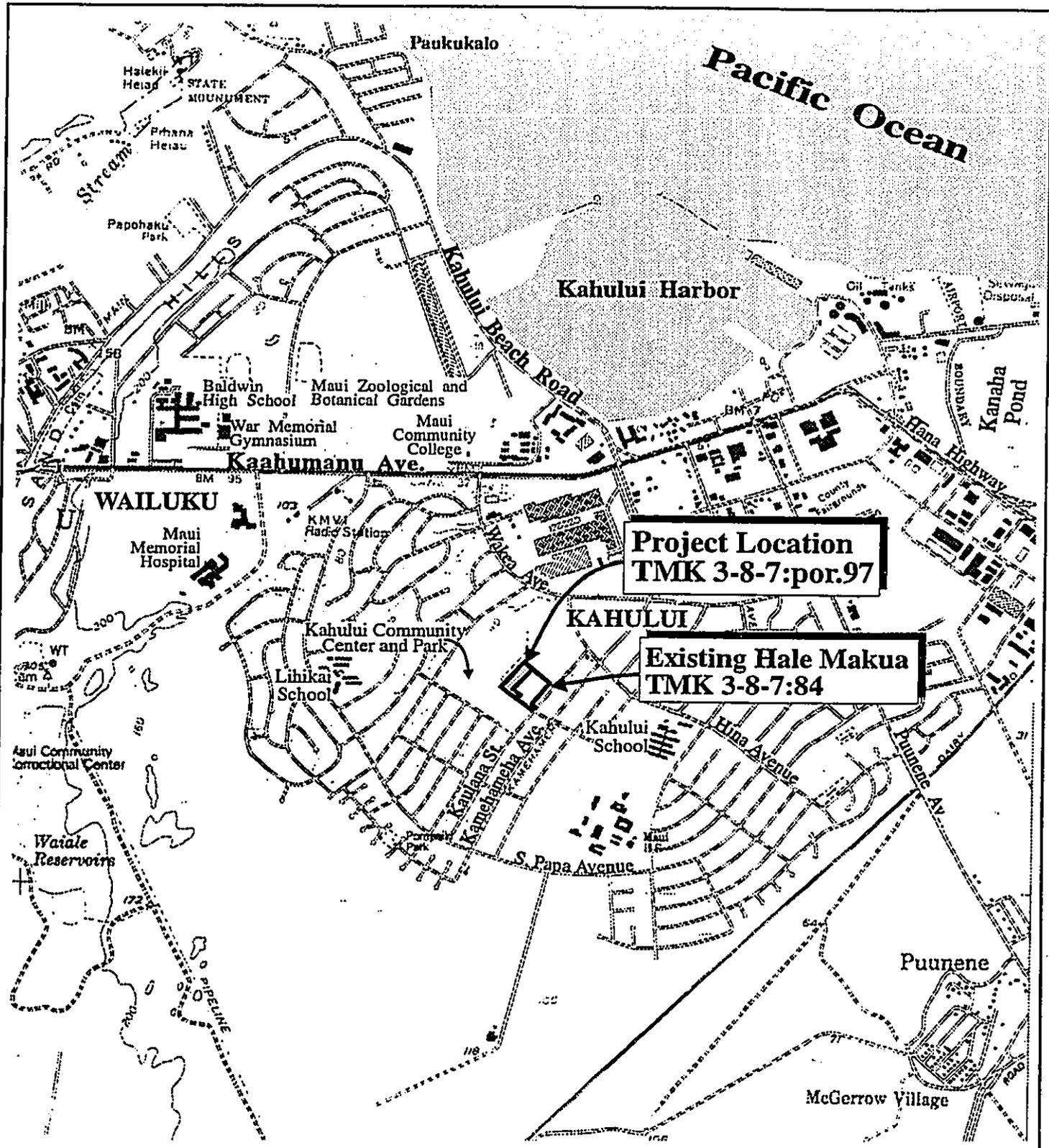
The existing Hale Makua facility is located in the heart of Kahului on a 5.6-acre parcel identified as TMK 3-8-07:84. The proposed expansion will be located on the adjoining 2.4-acre parcel, identified as TMK 3-8-07: portion of 97. See Figure 1 and Figure 2.

The property underlying the existing Kahului facility is owned by the County of Maui and is leased to Hale Makua. The 2.4-acre expansion area is now part of the Kahului Community Center which is also owned by the County of Maui. The portion of TMK 3-8-07:97 to be used for the proposed expansion is being subdivided and consolidated with TMK 3-8-07:84 to create a single 8.02-acre lot which will be leased to Hale Makua.

Currently, the proposed project site is undeveloped and vegetated with kiawe, haole koa, and various grasses and weeds.

B. PROPOSED IMPROVEMENTS

Construction of the new patient care facilities will involve clearing, grubbing and grading of the expansion area. The undeveloped expansion



**Figure 1 Hale Makua Kahului Expansion
Regional Location Map**



Prepared for: Hale Makua



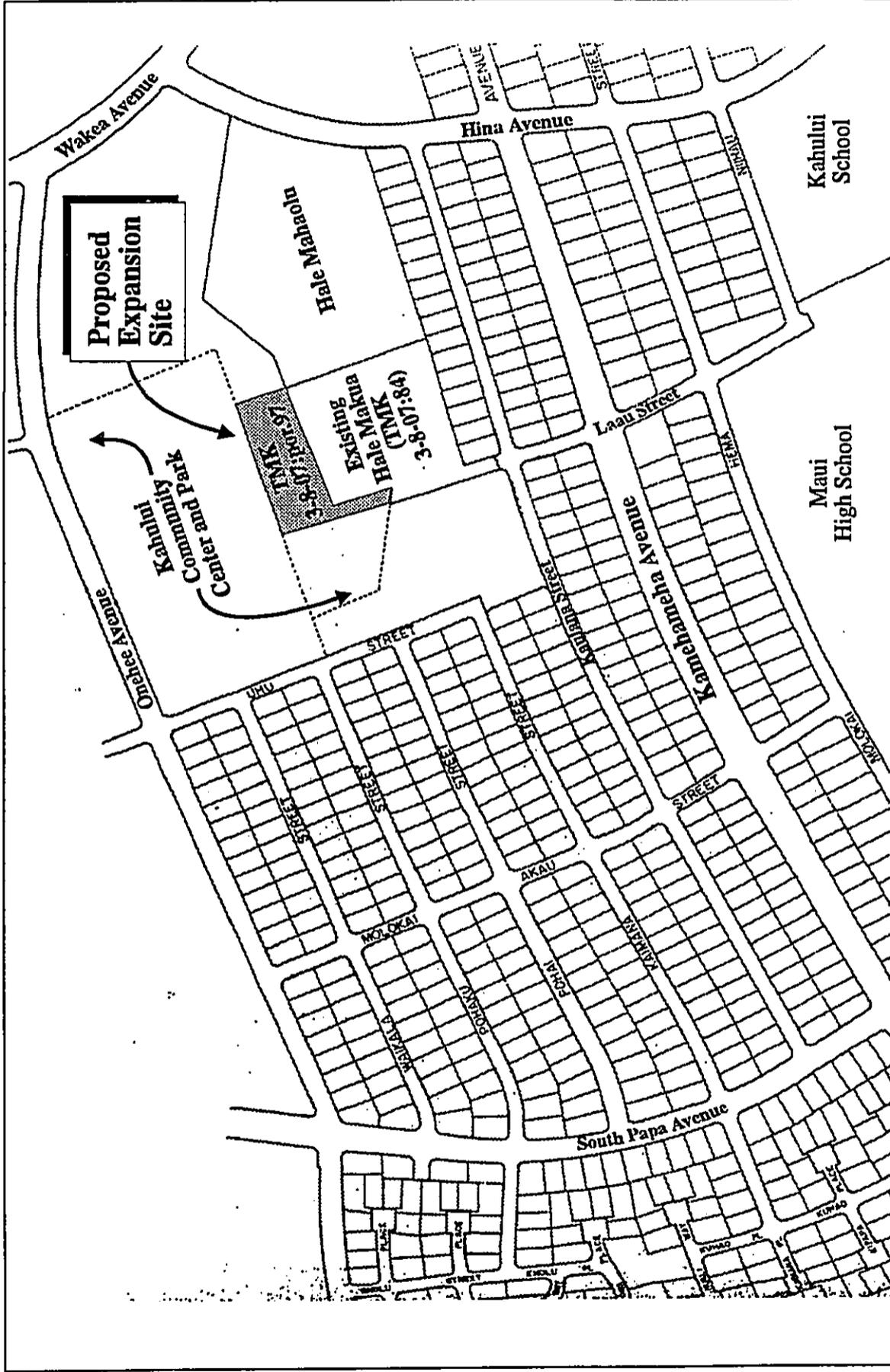


Figure 2 Hale Makua Kahului Expansion
Site Location Map



Prepared for: Hale Makua



NOT TO SCALE

area is sparsely vegetated with various grasses and weeds, kiawe, and haole koa. Mass grading of the site will be required to accommodate finished floor elevations which would establish an accessible transition to the existing Hale Makua facilities.

The proposed two-wing building addition will consist of a nursing facility encompassing approximately 41,000 sq. ft. within a single-story structure. See Figure 3 and Figure 4. The nursing facility will consist of 118 beds in semi-private rooms, and one (1) bed in two (2) isolation rooms.

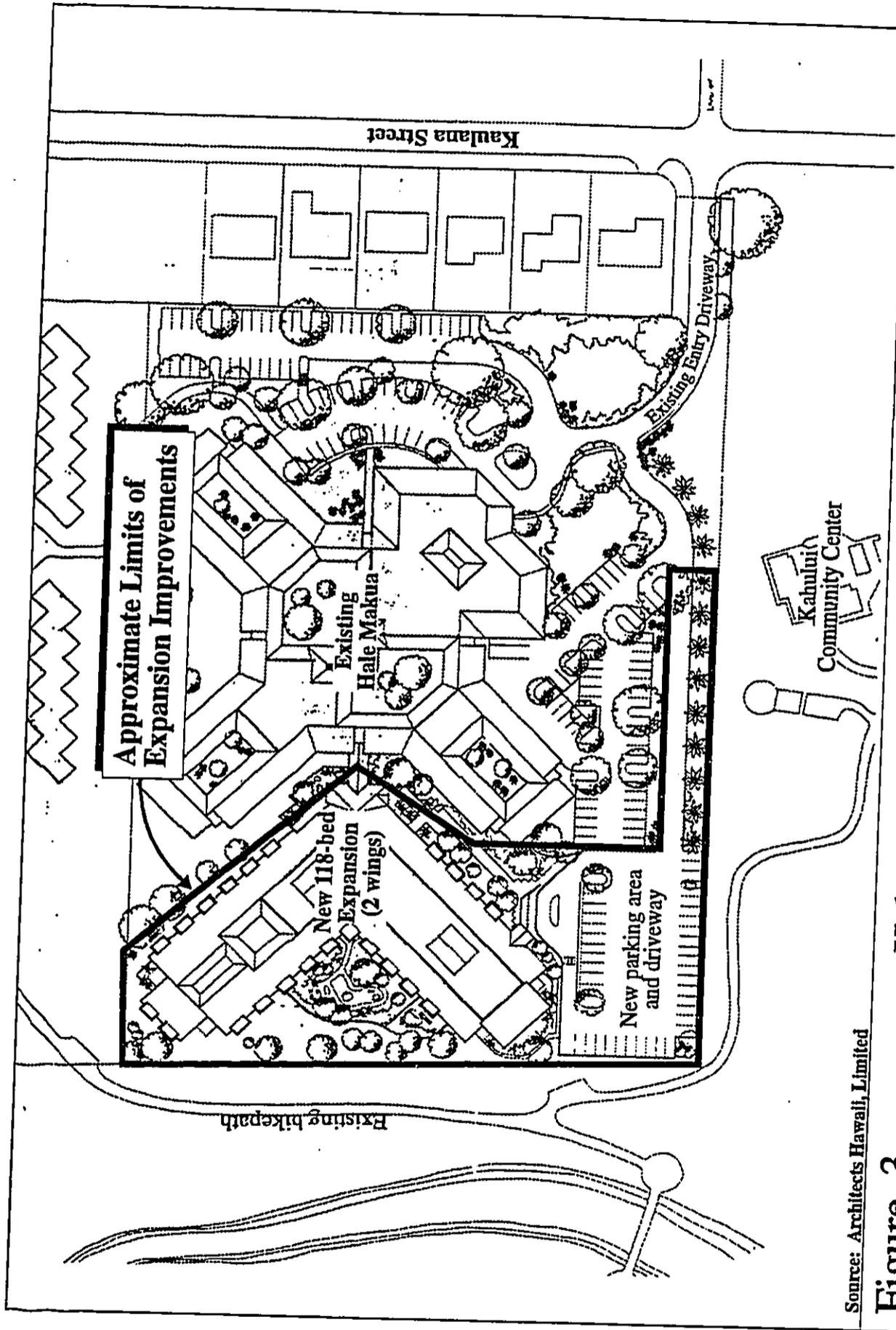
Air conditioning within the proposed building expansion will be located in the activities, dining, and quiet rooms, offices and interior corridors. All patient rooms and courtyards will be naturally ventilated.

Vehicular access to the new building will be provided along the westernmost property line via an extension of Hale Makua's existing paved driveway. A paved parking area for approximately 60 additional vehicles would be provided as part of the proposed improvements.

The proposed improvements are estimated to cost \$7.0 million. Construction is expected to begin in the second quarter of 1995 with a construction duration of approximately eight (8) to ten (10) months.

C. OPERATIONS AND MANAGEMENT

Hale Makua is a diversified health care system providing skilled nursing, intermediate care, home health care and related services and programs.



Approximate Limits of Expansion Improvements

New 118-bed Expansion (2 wings)

Existing Hale Makua

New parking area and driveway

Existing bikepath

Existing Entry Driveway

Kaulana Street

Kahului Community Center



Prepared for: Hale Makua

Source: Architects Hawaii, Limited

Figure 3

Hale Makua Kahului Expansion
Conceptual Site Plan



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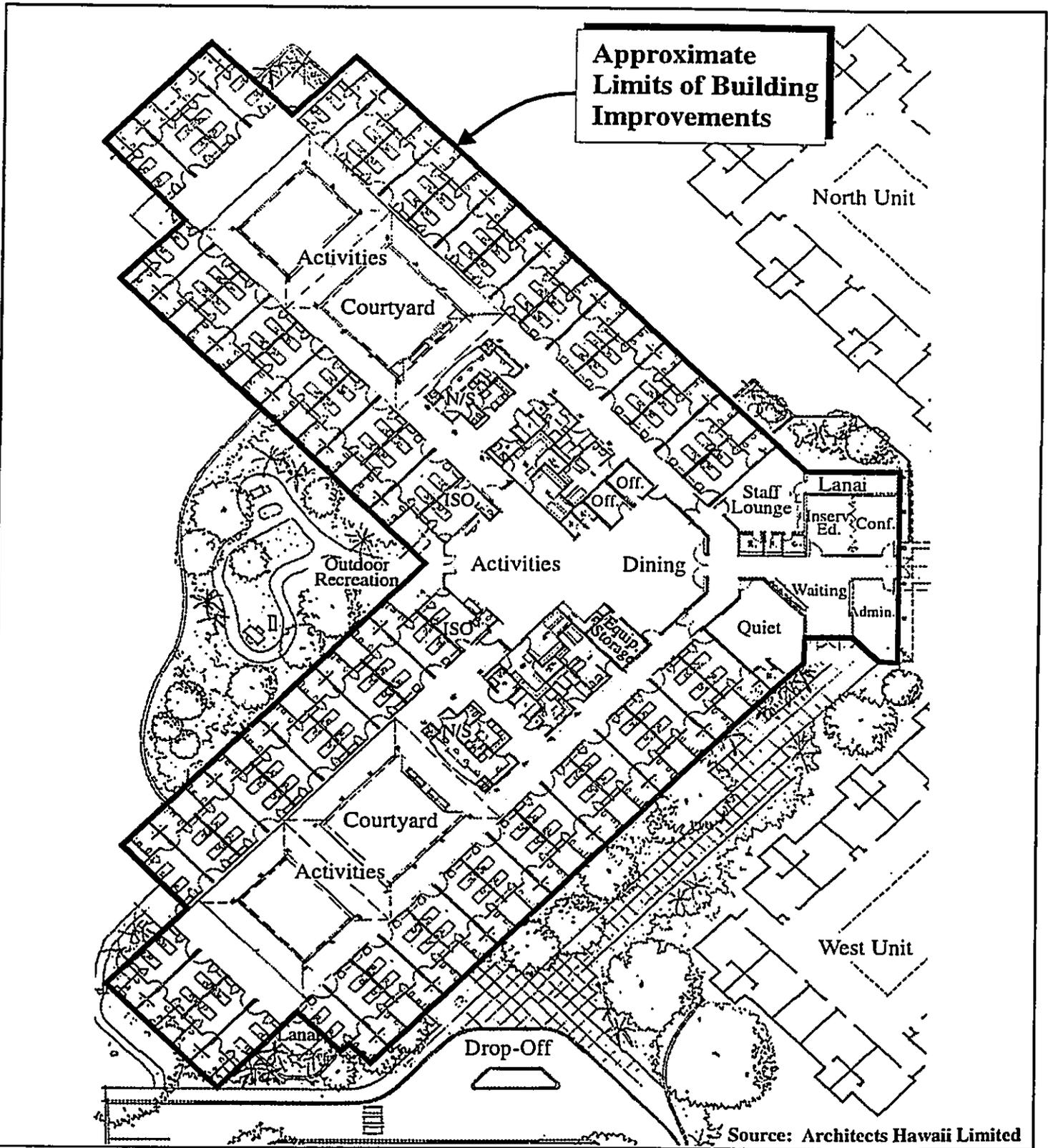


Figure 4 Hale Makua Kahului Expansion
Schematic Floor Plan



Prepared for: Hale Makua



NOT TO SCALE

Hale Makua facilities are located in Kahului and Wailuku. Key programs and services provided at the Kahului facility include long-term health care services and day hospital services. The 120 existing beds at Kahului are used for around-the-clock nursing care, while other onsite facilities support the Day Hospital program which offer day services to patients needing skilled nursing care. The Day Hospital currently serves approximately 20 patients, Monday through Friday, between 7:30 a.m. and 5:00 p.m. It is noted that an average of 15 to 18 of the total number of enrolled patients attend the Day Hospital each day. The Day Hospital program will not be expanded as a result of the proposed project.

The existing Kahului facility includes physical and occupational therapy facilities, kitchen and dining facilities, and storage and maintenance areas. In addition, the Kahului facility houses administrative offices (e.g., executive offices, human resources, accounting) for the Hale Makua system.

The Kahului facility employs a staff of approximately 118 employees. The proposed expansion would increase staffing by approximately 52 employees.

Key programs and services provided at the Wailuku facility also include long-term health care services and day hospital services. Accommodating a total of 124 beds, the Wailuku facility specializes in intermediate care, while also supporting the Day Hospital program.

The existing Wailuku facility, which employs a staff of approximately 90 employees, includes physical and occupational therapy facilities, administration offices, and laundry, storage, and maintenance areas.

Chapter II

***Description of the
Existing Environment***

II. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. Surrounding Land Uses

The proposed project site is located in Kahului Town. Kahului is home to Kahului Harbor, the island's only deep water port, and the Kahului Airport, the second busiest airport in the State. With its proximity to the Harbor and the Airport, the Kahului region has emerged as the focal point for heavy industrial, light industrial and commercial activities and services such as warehousing, baseyard operations, automotive sales and maintenance, and retailing for equipment and materials suppliers. The region is considered Central Maui's commercial retailing center with the Kaahumanu Center, the Maui Mall and the Kahului Shopping Center.

Surrounding this commercial core is an expansive residential area comprised principally of single-family residential units. Residential uses encompass the area extending from Maui Memorial Hospital to Puunene Avenue.

The proposed project site is located adjacent to the existing Hale Makua facility. Land uses in proximity to the project site include the Kahului Community Center and Park located to the immediate west and north of the property. To the east of the project site is the Hale Mahaolu Elua and Ekahi elderly housing complex. Further to the northeast, across Wakea Avenue, are The Maui Land and Pineapple Cannery and Kaahumanu Center. Single-family residences are generally located in adjacent areas to the south, east and west.

2. **Climate**

Like most areas of Hawaii, Maui's climate is relatively uniform year-round. Characteristic of Hawaii's climate, the project site experiences mild and uniform temperatures year round, moderate humidity and a relatively consistent northeasterly tradewind. Variation in climate on the island is largely left to local terrain.

Average temperatures at the project site (based on temperatures recorded at Kahului Airport) range from lows in the 60's to highs in the 80's. August is historically the warmest month, while January and February are the coolest. Rainfall at the project site averages less than twenty (20) inches per year (Atlas of Hawaii, 1983). Winds in the Kahului region are predominantly out of the north-northeast and northeast.

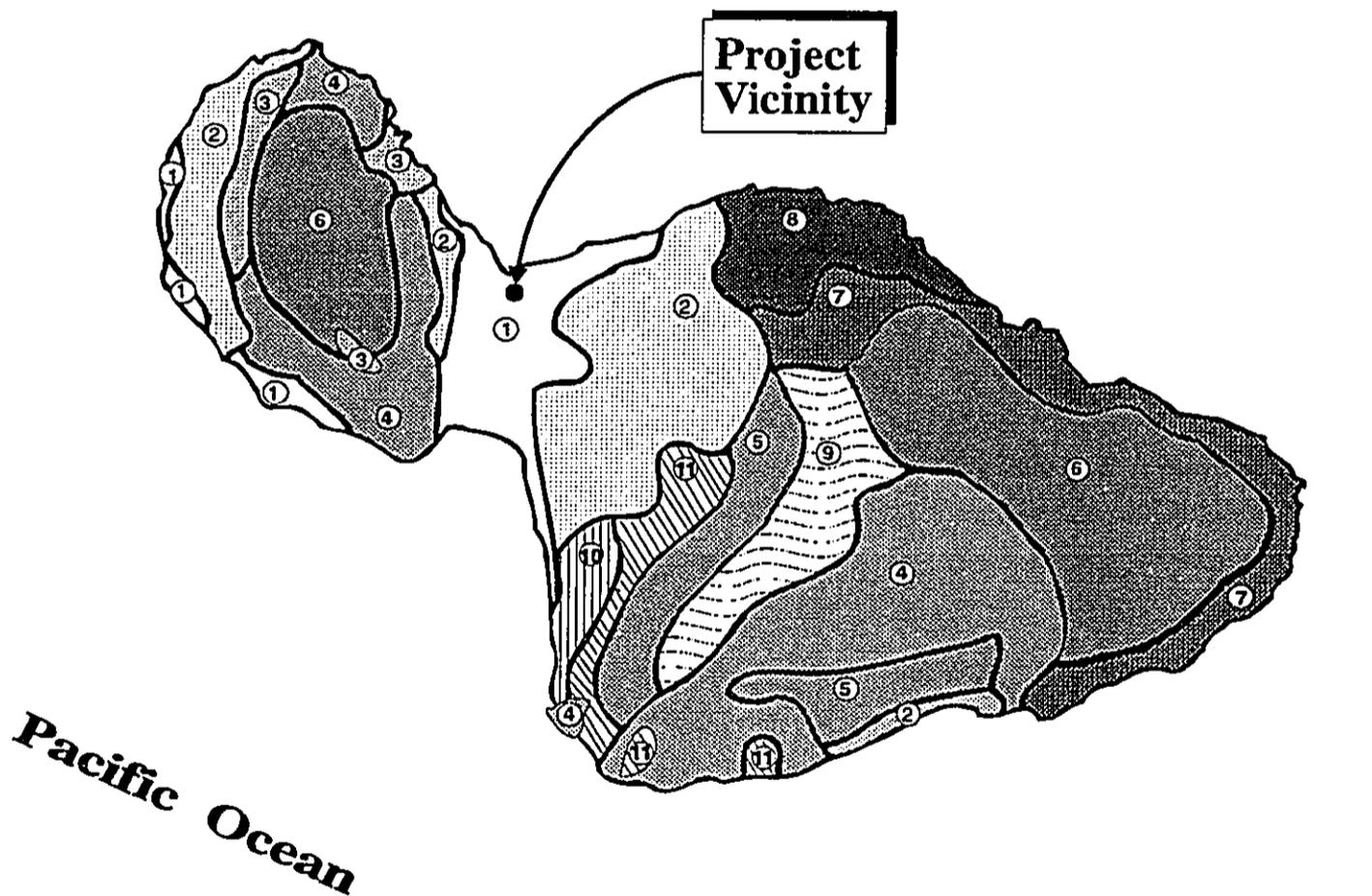
3. **Topography and Soil Characteristics**

The project site is located on Maui's flat central isthmus. The approximate elevation of the project site ranges from 40 to 80 feet above sea level.

Underlying the proposed site and surrounding lands are soils belonging to the Pulehu-Ewa-Jaucas association. See Figure 5. The soil type specific to the project site is Puuone Sand, 7 to 30 percent slopes (PZUE). See Figure 6. PZUE soils are predominate in the Kahului region and are typified by a sandy surface layer underlain by cemented sand. Characteristics of this soil type are rapid permeability, slow runoff, and a moderate to severe erosion hazard. Naturally occurring vegetation in this series include bermuda grass, kiawe, and lantana.

LEGEND

- | | |
|--|---|
|  Pulchu-Ewa-Jaucas association |  Hana-Makaalae-Kailua association |
|  Wainkoa-Keahua-Molokai association |  Pauwela-Haiku association |
|  Honolua-Olelo association |  Laumaiu-Kaipoi-Olinda association |
|  Rock land-Rough mountainous land association |  Keawakapu-Makena association |
|  Puu Pa-Kula-Pane association |  Kamaole-Oanapuka association |
|  Hydrandepts-Tropaquods association | |



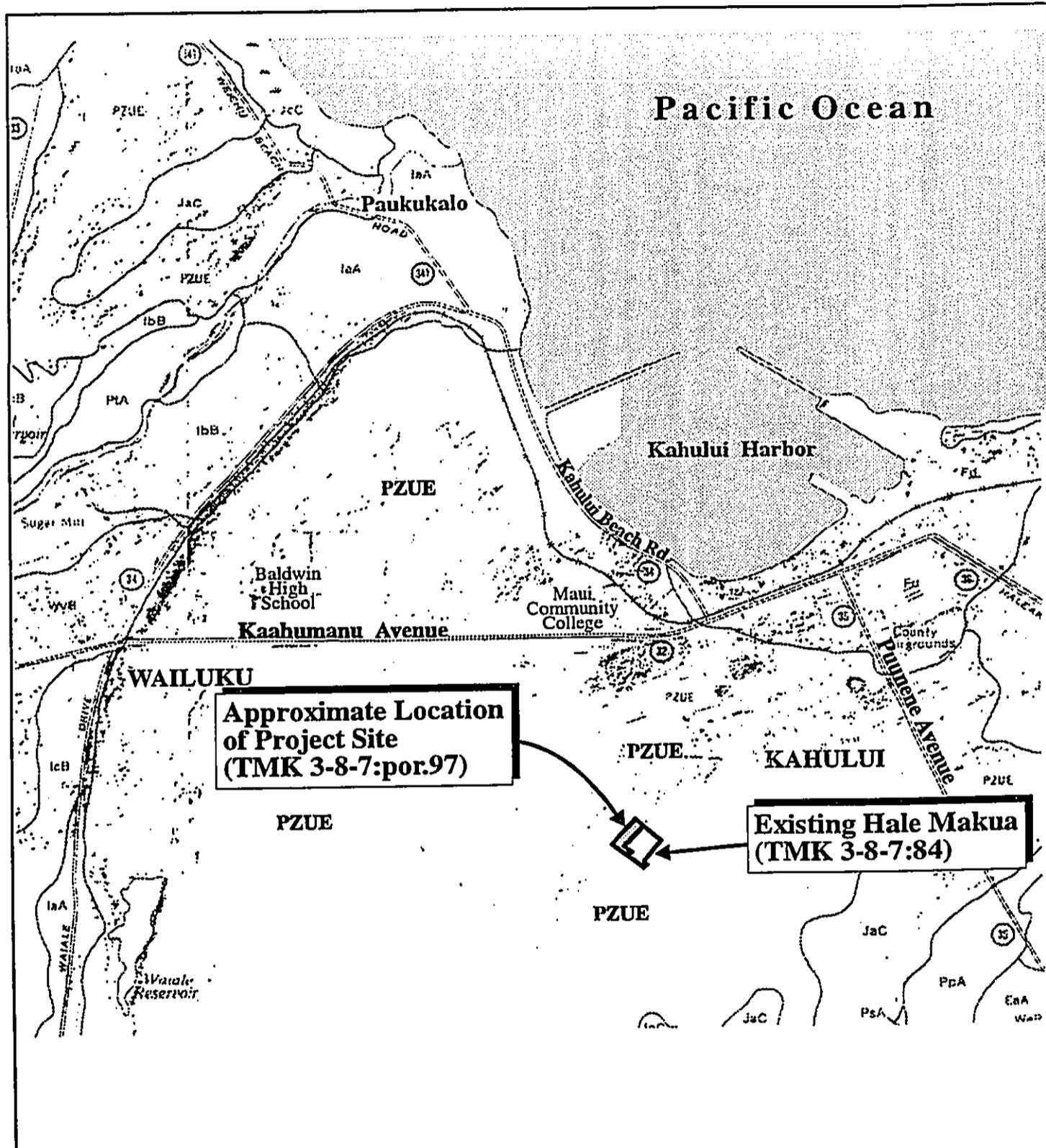
Map Source: USDA Soil Conservation Service

Figure 5. Hale Makua Kahului Expansion
Soil Association Map



Prepared for: Hale Makua

NOT TO SCALE



Source: U.S. Soil Conservation Service

Figure 6 Hale Makua Kahului Expansion
Soil Classifications Map



Prepared for: Hale Makua



4. **Flood and Tsunami Hazard**

The project site is identified as Zone "C", an area of minimal flooding as determined by the Flood Insurance Rate Map for this region. See Figure 7. The site is located well beyond coastal inundation areas.

5. **Flora and Fauna**

The subject property is adjacent to the Kahului Community Center and Park and the existing Hale Makua facility. Existing vegetation on the expansion site includes kiawe, haole koa, common grasses and weeds.

Fauna and avifauna are also characteristic of urban areas. Fauna typically found in the vicinity include mongoose, rats, dogs and cats. Avifauna typically include mynas, several types of doves, and house sparrows. There are no endangered species of fauna or avifauna at the project site.

6. **Archaeological Resources**

An archaeological inventory survey was conducted by Archaeological Consultants of Hawaii Inc. (see Appendix A) between August 12 and 14, 1992. The inventory survey, which included a 100% surface survey and nine (9) test trenches at the project site, encountered no features or deposits of historic significance. Additionally, while human burials are occasionally encountered in sand deposits (a soil condition found at the project site), test excavations onsite did not encounter human remains.

7. **Air Quality**

Air quality in the Wailuku-Kahului region is considered good as point sources (e.g., Maui Electric Power Plant, HC&S Mill) and non-point sources (e.g. automobile emissions) of emission are not significant to generate high concentration of pollutants. The relatively high quality of air can also be attributed to the region's constant exposure to winds which quickly disperse concentrations of emissions. This rapid dispersion is evident during burning of sugar cane in fields located to the southeast of the Kahului residential core.

8. **Noise**

Traffic noise is the predominant source of background noise in the vicinity of the project. To the north and west of the property, use of Kahului Community Center and Park, and the Kokua Pool facilities could also add to background noise levels in the surrounding neighborhood on an occasional basis.

9. **Visual Resources**

The West Maui Mountain Range and Haleakala are visible from the expansion site. However, given its relatively low elevation in the flat central isthmus, the project site is not considered unique or special in terms of visual resource value.

B. **SOCIO-ECONOMIC ENVIRONMENT**

1. **Population**

The population of the County of Maui has exhibited relatively strong growth over the past decade with the 1990 population estimated to be 100,504, a 41.8% increase over the 1980 population of 70,847. Growth in the County is expected to continue, with resident

population projections to the years 2000 and 2010, estimated to be 124,562 and 145,872, respectively (Community Resources, Inc., 1994).

The estimated 1990 population of the Wailuku-Kahului Community Plan region is 32,816. A projection of the region's population shows an increase to 40,452 by the year 2000 and to 48,132 by the year 2010 (Community Resources, Inc., 1994).

2. **Economy**

The Kahului region is the Island's center of commerce. Combined with neighboring Wailuku, the region's economic character encompasses a broad range of commercial, service, and governmental activities. In addition, the region is surrounded by significant agricultural acreages which include sugar cane fields, pineapple fields, and macadamia nut orchards. The vast expanse of agricultural land, managed by Hawaiian Commercial & Sugar (HC&S) and Wailuku Agribusiness Company, is considered a key component of the local economy.

C. **PUBLIC SERVICES**

1. **Recreational and Social Services**

The Wailuku-Kahului region encompasses a full range of recreational opportunities, including numerous County facilities such as Pomaikai Park, Kahului Park and Community Center, Kanaha Beach Park and the War Memorial Complex. Also located in close proximity to the project are the facilities and grounds of Maui High School and Kahului and Lihikai Elementary Schools.

2. **Police and Fire Protection**

Police protection for the Wailuku-Kahului region is provided by the County Police Department headquartered at the Wailuku Station, approximately one (1) mile from the project site. The region is served by the Department's Central Maui patrol.

Fire prevention, suppression, and protection services for the Wailuku-Kahului region are provided by the County Department of Fire Control's Kahului and Wailuku Stations. The Kahului Station, located on Dairy Road, is approximately 1.9 miles from the project site. The Wailuku Station, located in Wailuku town near Wells Park, is approximately 1.9 miles from the site.

3. **Solid Waste**

Single-family residential solid waste collection service is provided by the County of Maui on a once-a-week basis. Residential solid waste collected by County crews are disposed at the County's 55-acre Central Maui Landfill, located four miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill accepts commercial waste from private collection companies. Refuse collection for the project would be provided by a private collection company.

4. **Health Care**

Health care services provided by Hale Makua have been previously described in Chapter I.

Health care services are also provided by Maui Memorial Hospital, the only major medical facility on the Island. Acute, general and emergency care services are provided by the 145-bed facility. The

hospital is located approximately 1.2 miles from the project site. In addition, numerous privately operated medical/dental clinics and offices are located in the Wailuku-Kahului area to serve residents of the project as well as the region.

5. Schools

The Wailuku-Kahului region is served by the State Department of Education's public school system as well as several privately operated schools accommodating elementary, intermediate and high school students. Department of Education facilities in the Kahului area include Lihikai and Kahului Schools (Grades K-5), Maui Waena Intermediate School (Grades 6-8), and Maui High School (Grades 9-12). Existing facilities in the Wailuku area include Wailuku Elementary School (Grades K-5), Iao Intermediate School (Grades 6-8), and Baldwin High School (Grades 9-12).

Maui Community College, a branch of the University of Hawaii, serves as the Island's only Community College.

D. INFRASTRUCTURE

1. Roadways

The Wailuku-Kahului region is served by a roadway network which includes arterial, collector and local roads. Major roadways include Kaahumanu Avenue, the principal linkage between Wailuku and Kahului, Hana Highway and Puunene Avenue.

Access to the subject property is off of Laau Street, via Kamehameha Avenue. Both Laau Street and Kamehameha Avenue are two-lane, two-way paved County roadways.

Secondary access to the subject property is also offered from Kaulana Street, via Hina Avenue or South Papa Avenue.

2. Water

The Wailuku-Kahului region is served by the Department of Water Supply's (DWS) domestic water system. Water drawn from the Iao Aquifer System is conveyed to this region for distribution and consumption.

Existing waterlines in the vicinity of the proposed project site include a 12-inch distribution line located along the southeastern boundary of the existing Hale Makua parking area. In addition, connecting to this existing 12-inch line near the southern corner of the existing Hale Makua parking area is an 8-inch distribution line, which runs approximately 100 feet west along the existing Hale Makua driveway.

Other distribution lines in the vicinity include an 8-inch distribution line along Kaulana Street and Laau Street.

3. Wastewater

Domestic wastewater generated in the Wailuku-Kahului region is conveyed to the County's Wailuku-Kahului Wastewater Reclamation Facility located one-half mile south of Kahului Harbor. The design capacity of the facility is 7.9 million gallons per day (MGD). Average daily flow currently processed through the plant is approximately 5.3 MGD.

Existing sewerlines located within the vicinity of the project site include an 8-inch gravity line located along the northeastern

boundary of the existing Hale Makua property, between the existing Hale Makua and Hale Mahaolu facilities. This 8-inch line connects to an existing 8-inch sewerline located along Hina Avenue, near the intersection of Wakea Avenue and Hina Avenue.

4. **Drainage**

Storm runoff generated onsite sheetflows into a natural drainage channel located about 100 feet north of the project site. The natural drainageway traverses through the Kahului Community Park in a generally east to west direction to a sump area located near the intersection of Wakea Avenue and Hina Avenue. No offsite runoff drains through the subject property. Existing storm runoff generated from the proposed project site is estimated at 2.4 cubic feet per second (cfs). See Appendix B.

5. **Electric Power and Telephone Service**

Electrical and telephone services are provided by Maui Electric Company and GTE Hawaiian Telephone, respectively.

Chapter III

Potential Impacts and Mitigation Measures

III. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. PHYSICAL ENVIRONMENT

1. Surrounding Use

The proposed expansion is compatible in use and scale with the existing Hale Makua facility. Located within the residential areas of Kahului Town, the project is adjacent to the Kahului Community Center and Park, Hale Mahaolu elderly complex, the Kokua Pool, and single-family residences. The proposed expansion is not anticipated to alter land use relationships between Hale Makua and surrounding properties.

2. Flora and Fauna

There are no known significant habitats or rare, endangered or threatened species of flora and fauna located within the project site. The proposed project is therefore not considered an adverse impact upon these environmental features.

3. Archaeological Resources

An archaeological inventory surface survey with subsurface testing was conducted at the project site on August 12, 13, and 14, 1992 by Archaeological Consultants of Hawaii, Inc. Refer to Appendix A. No significant historic sites or burials were encountered during the survey.

In a letter dated September 14, 1992, DLNR - State Historic Preservation Division (SHPD) acknowledged the review of the inventory survey report prepared by Archaeological Consultants of Hawaii, Inc., and determined that the expansion site has been adequately surveyed and tested. Consequently, SHPD concludes

that the expansion of Hale Makua will have "no effect" on significant historic sites. See Appendix C.

The inventory survey report prepared by Archaeological Consultants of Hawaii, Inc. was also reviewed by the Maui/Lanai'i Islands Burial Council (see Appendix D) and the Maui County Cultural Resources Commission (CRC) (see Appendix E). Both the Burial Council and the CRC concur that the proposed Hale Makua expansion will have "no effect" on significant historic sites.

Although there is no evidence of human burials on the expansion site, due to its sandy soil characteristic, potential for encountering burials during construction may exist. Should any unanticipated human remains be encountered during construction, work in the immediate area will be halted and, in accordance with HRS Chapter 6E, the DLNR - State Historic Preservation Division will be notified.

4. Air Quality

Air quality impacts attributed to the project will include dust generated by short-term, construction-related activities. Site work such as grading and utilities and parking lot construction, for example, will generate airborne particulates. Dust control measures such as regular watering and sprinkling will be implemented as needed to minimize wind-blown emissions.

5. Noise

As with air quality, ambient noise conditions will be impacted by construction activities. Heavy construction equipment, such as bulldozers, front end loaders, and materials-carrying trucks and

trailers, would be the dominant source of noise during the site construction period. To aid in the mitigation of construction noise impacts upon surrounding uses, construction activities will be conducted during the daylight hours only.

The use of the property for a nursing facility and skilled unit is compatible with surrounding uses. On a long-term basis, the project will not generate adverse noise conditions.

6. Visual Resources

The project will be fully landscaped to create a site visually and aesthetically integrated with the surrounding developed properties. The proposed project will include two (2) wings in one (1) building which will not exceed 30 feet above grade in height. The Hale Makua expansion complements the existing Hale Makua facility as well as the single-family residential character of the surrounding community.

B. IMPACTS TO COMMUNITY SETTING

1. Local Economy

On a short-term basis, the project will support construction and construction-related employment. Over the long-term, the project will provide limited support to the service sector for project operations and maintenance. Direct onsite employment generated by the project will include new positions in nursing, housekeeping, maintenance and dietary departments.

2. Public Services

The proposed expansion project is not anticipated to affect the service capabilities of educational, recreational, police, fire and

emergency medical operations. The project will not extend existing service area limits for emergency services.

3. **Solid Waste**

A solid waste management plan will be prepared in coordination with the Solid Waste Division of the Department of Public Works and Waste Management for the disposal of clearing and grubbing materials from the project site during construction.

C. **IMPACTS TO INFRASTRUCTURE**

1. **Roadways**

Access to the subject property is off of Laau Street, via Kamehameha Avenue. Both Laau Street and Kamehameha Avenue are two-lane, two-way paved County roadways. Secondary access to the property is also offered from Kaulana Street, via Hina Avenue or Papa Avenue.

The 118 existing employees and volunteers at the existing Kahului facility work in three shifts as summarized in Table 1.

Local streets serving the surrounding single family residences do not carry high traffic volumes. Because of the work shift distribution for Hale Makua's employees, trip generation is spread throughout the 24-hour operating day. It is noted that employee arrival and departure times for the work shifts are earlier than the normal morning and afternoon peak hours. From a traffic impact standpoint, therefore, the proposed expansion is not anticipated to adversely affect existing intersection and roadway operating service levels.

Table 1

EMPLOYEE BREAKDOWN BY SHIFTS				
Shift	Time	No. of Current Employees	No. of Additional Employees	Total
Day	7:00 am to 3:00 pm	97 ^a	40	137
Evening	3:00 pm to 11:00 pm	13	4	17
Night	11:00 pm to 7:00 am	8	8	16
TOTAL		118	52	170
^a Includes approximately 7 volunteers.				

Visitor traffic is confined to the day and evening shifts, as indicated in Table 2. The estimated number of additional visitor families to

Table 2

VISITOR BREAKDOWN BY SHIFT				
Shift	Time	Average No. of Existing Visitors	No. of Additional Visitors	Total
Day	7:00 am to 3:00 pm	15	15	30
Evening	3:00 pm to 11:00 pm	24	24	48
Night	11:00 pm to 7:00 am	0	0	0
TOTAL		39	39	78

the facility due to the expansion is 15 and 24 for the day and evening shifts, respectively. The volume of visitor traffic is distributed throughout the day and early evening, and is not anticipated to result in any traffic delay problems at surrounding local street intersections.

Day Hospital traffic include families dropping off and picking up patients from the Day Hospital Program. An average of 15-18 patients participate in the program each day. Approximately 90% (14 to 16) of these patients are transported to the facility via a Maui Economic Opportunity van. Accordingly, the volume of traffic associated with the Day Hospital Program is not considered significant.

2. **Water**

Average daily domestic water demand at the existing facility is estimated at approximately 19,700 gallons per day (gpd) or 164 gallons per patient per day. An existing private brackish water irrigation well is located onsite and serves as the water source for exterior landscaping. Landscaped areas within the building facilities are irrigated from the domestic (County) system.

Based on the historical 164 gallons per patient per day ratio, it is estimated that the proposed 118 additional beds will generate an additional domestic water demand of 19,350 gpd (average daily demand). Therefore, the total average water demand of the Hale Makua facility upon the completion of the proposed expansion is estimated to be approximately 39,050 gpd.

3. Wastewater

Wastewater from the Kahului Facility is collected by the County's collection and transmission system and treated and disposed at the Wailuku-Kahului Wastewater Reclamation Facility.

As previously noted, the total water demand for the expanded Hale Makua facility is estimated at approximately 39,050 gpd. This volume excludes irrigation demand which is met through an existing onsite brackish water well. However, a portion of the landscaped area found within the facility is served by the domestic system. With these factors, a wastewater generation rate of 85% of total domestic water demand is assumed. This basis is considered a best estimate only and is intended to provide an order of magnitude estimate of wastewater contribution from the facility.

On this basis, it is estimated that the additional wastewater contribution from the 118 additional beds would be approximately 16,450 gpd (19,350 gpd domestic water use X 0.85). The estimated total wastewater to be generated by the expanded Hale Makua facility (238 beds) is approximately 33,200 gpd.

4. Drainage

The majority of runoff generated onsite sheet flows to a natural drainage channel located north of the project site. Only a small portion of the runoff generated onsite will drain into the existing Hale Makua facility. It is anticipated that the existing drainage patterns will be maintained.

The new, expanded facility will develop and maintain its own drainage system. Flows from the proposed parking and facility will

be intercepted by catch basins and conveyed across the existing bike path located along the north and northwestern boundaries of the subject property via 30-inch culverts. Runoff will be directed to the existing natural drainage channel located north of the subject property. Runoff conveyed through this drainageway discharges into a sump located near the Wakea Avenue/Hina Avenue intersection.

All unpaved areas of the project site will be grassed and landscaped. Based on a 1-hour, 10-year storm, developed runoff from the new site is estimated to be 6.4 cfs. While storm runoff will increase slightly (2.4 cfs existing to 6.4 cfs developed), flows will not significantly alter existing drainage conditions. Refer to Appendix B.

Development of the proposed project is not expected to cause any adverse effects to adjacent or downstream properties.

Chapter IV

***Relationship to Governmental
Plans, Policies, and Controls***

IV. RELATIONSHIPS TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes the four major land use districts in which all lands in the State are placed. These districts are designated "Urban", "Rural", "Agricultural" and "Conservation". The subject parcel is within the "Urban" District. The proposed action involves the use of the property for the expansion of the existing Hale Makua facility which is compatible with the "Urban" designation.

B. MAUI COUNTY GENERAL PLAN

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help guide the long range development of the County. As stated in the Maui County Charter, "The purpose of the General Plan is to recognize and state the major problems and opportunities concerning the needs and the development of the County and the social, economic and environmental effects of such development and set forth the desired sequence, patterns and characteristics of future development."

The proposed action is in keeping with the following General Plan objective and policy:

Objective:

1. To meet the health needs of all residents and visitors.
2. To create a community in which the needs of all segments of the population will be recognized and met.

Policies:

1. Encourage the expansion and improvement of our hospitals and our public and private medical facilities.

-
2. Provide a variety of services and programs that meet the special needs of recent immigrants and of the young, the elderly and the handicapped.

C. WAILUKU-KAHULUI COMMUNITY PLAN

The subject parcel is located in the Wailuku-Kahului Community Plan region which is one of nine Community Plan regions established in the County of Maui. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns and characteristics of future development in the region.

On January 22, 1993, Ordinance 2206 was passed by the Maui County Council amending the Wailuku-Kahului Community Plan map from Park use to Public/Quasi-Public use for the subject property (TMK 3-8-7:por. 97). The amended Community Plan designation of the subject property allows for the expansion of the existing Hale Makua facility.

The proposed project conforms with the Wailuku-Kahului Community Plan's recommendation to improve health and public safety services and facilities.

D. ZONING

On January 22, 1993, Ordinance 2207 was passed by the Maui County Council changing the zoning designation of the existing Hale Makua facility (TMK 3-8-7:84) and the proposed project site (TMK 3-8-7:por.97) from R-3 Residential to Public/Quasi-Public. Total acreage encompassed approximately 8.02 acres. With this change in zoning, the proposed Hale Makua expansion, as well as the existing Hale Makua facility, are consistent with County of Maui zoning provisions.

Chapter V

Agencies Consulted

V. AGENCIES CONSULTED

The following agencies were provided the opportunity to review and comment on the proposed expansion. This review was afforded during the Community Plan Amendment and Change in Zoning process.

1. Stephanie Aveiro, Director
of Human Concerns
Department of Housing and
Human Concerns
200 South High Street
Wailuku, Hawaii 96793
2. Kisuk Cheung, P. E.
Director of Engineering
Department of Army
U.S. Army Engineer District,
Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440
3. Robert Siarot, Maui District
Engineer
Department of Transportation
Highways Division
650 Palapala Drive
Kahului, Hawaii 96732
4. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural
Resources
33 South King Street, 6th Floor
Honolulu, Hawaii 96813
5. David H. Nakagawa
Environmental Health Program
Supervisor
Maui District Health Office
Department of Health
54 High Street
Wailuku, Hawaii 96793
6. George Kaya, Director
Department of Public Works and
Waste Management
200 South High Street
Wailuku, Hawaii 96793
7. David Craddick, Director
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Hawaii 96793
8. Charmaine Tavares, Director
Department of Parks and
Recreation
1580 Kaahumanu Avenue
Kahului, Hawaii 96732
9. Michael R. Cummings, Lieutenant
Department of Fire Control
Fire Prevention Bureau
County of Maui
200 Dairy Road
Kahului, Hawaii 96732

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Appendices

Appendix A

Archaeological Report

**INVENTORY SURVEY WITH SUBSURFACE TESTING
REPORT FOR A PROPERTY LOCATED AT
TMK: 3-8-07:97 (POR.), IN THE AHUPUA'A OF WAILUKU,
DISTRICT OF WAILUKU, ON THE ISLAND OF MAUI.
SEPTEMBER 1992.**

**Prepared for: Mr. Tony Krieg
Hale Makua
472 Kaulana St.
Kahului, Hawaii 96732**

**Prepared by: Archaeological Consultants of Hawaii, Inc.
Joseph Kennedy, M.A.
Peter Brennan, M.A.
David Soldo, B.A.
59-624 Pupukea Rd.
Haleiwa, Hawaii 96712**

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Inventory Survey with Subsurface Testing Report for a
Property Located at TMK: 3-8-7:97 (por.), in the Ahupua'a of
Wailuku, in the District of Wailuku, on the Island of Maui.

ABSTRACT

On August 12, 13, and 14, 1992 an archaeological inventory survey with subsurface testing was conducted on a 2.4 acre property which is proposed as an extension to Hale Makua. A 100% surface survey was undertaken. No significant historic sites were encountered. Given the absence of surface sites, the subsurface trenches were excavated across the testable portion of the subject property. Nine test trenches, totalling 226 meters in length, were mechanically excavated. Portions of the project area had been impacted by previous construction activities at Kahului Park; a bike path, the development of adjacent commercial buildings, and bulldozing on portions of the property. These areas were not subject to archaeological testing. The topography of the project area, including steep slopes and drainage channels, precluded other portions of the property from being tested. No archaeological sites of any significance were encountered. No cultural materials, historic or prehistoric, were collected. Archaeological Consultants of Hawaii, Inc., concludes that future construction activities on the subject property will have "no effect" on significant historic resources.

Section 1: INTRODUCTION

On August 4th, 1992, Archaeological Consultants of Hawaii, Inc., (ACH) was contacted by Mr. Tony Krieg, the director of Hale Makua, to conduct an archaeological inventory survey with subsurface testing within the proposed project area. The subject property is owned by Hale Makua. The project area is located at TMK: 3-8-07: portion 97, in Wailuku Ahupua'a, Wailuku District, on the Island of Maui (see Map 1). An archaeological survey with subsurface testing was necessary on this property in order to identify significant prehistoric and historic sites on the property.

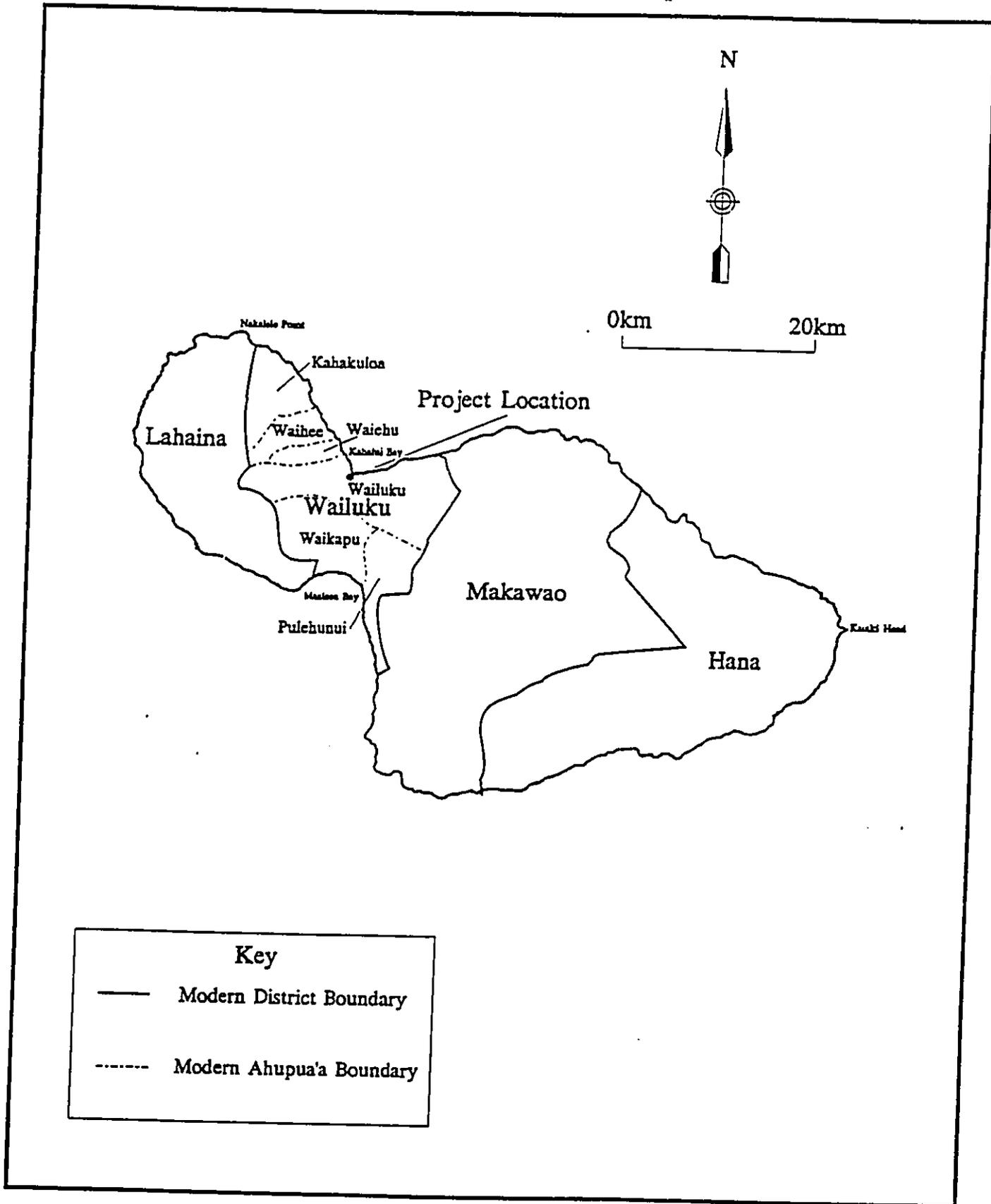
This study became necessary after Ms. Theresa Donham, the State Historic Preservation Division staff archaeologist on Maui, had conducted an inspection of the property (letter dated August 4th, 1992, Ms. A. Griffin, SHPD, to Mr. B. Miskae). She recommended that subsurface testing should be conducted in the relatively undisturbed sand dune on the property in order to determine whether human burials were present. Human burials have been encountered in sand deposits along this coast; those discovered so far have been isolated and dispersed. It was thus reasonable to expect that human remains could be encountered during subsurface testing on the sand dune on this property.

Section 2: PHYSICAL SETTING

The proposed project is located at geographic grid coordinates 20 52'50"N, 156 28'45"W, and at UTM (Universal Transverse Mercator) co-ordinates 2311500mN, 762214mE. The project area is located approximately 1200m (meters), or 4000ft (feet) inland from Kahului Harbor, and is between 40ft and 80ft above mean sea level (AMSL) (see Map 2).

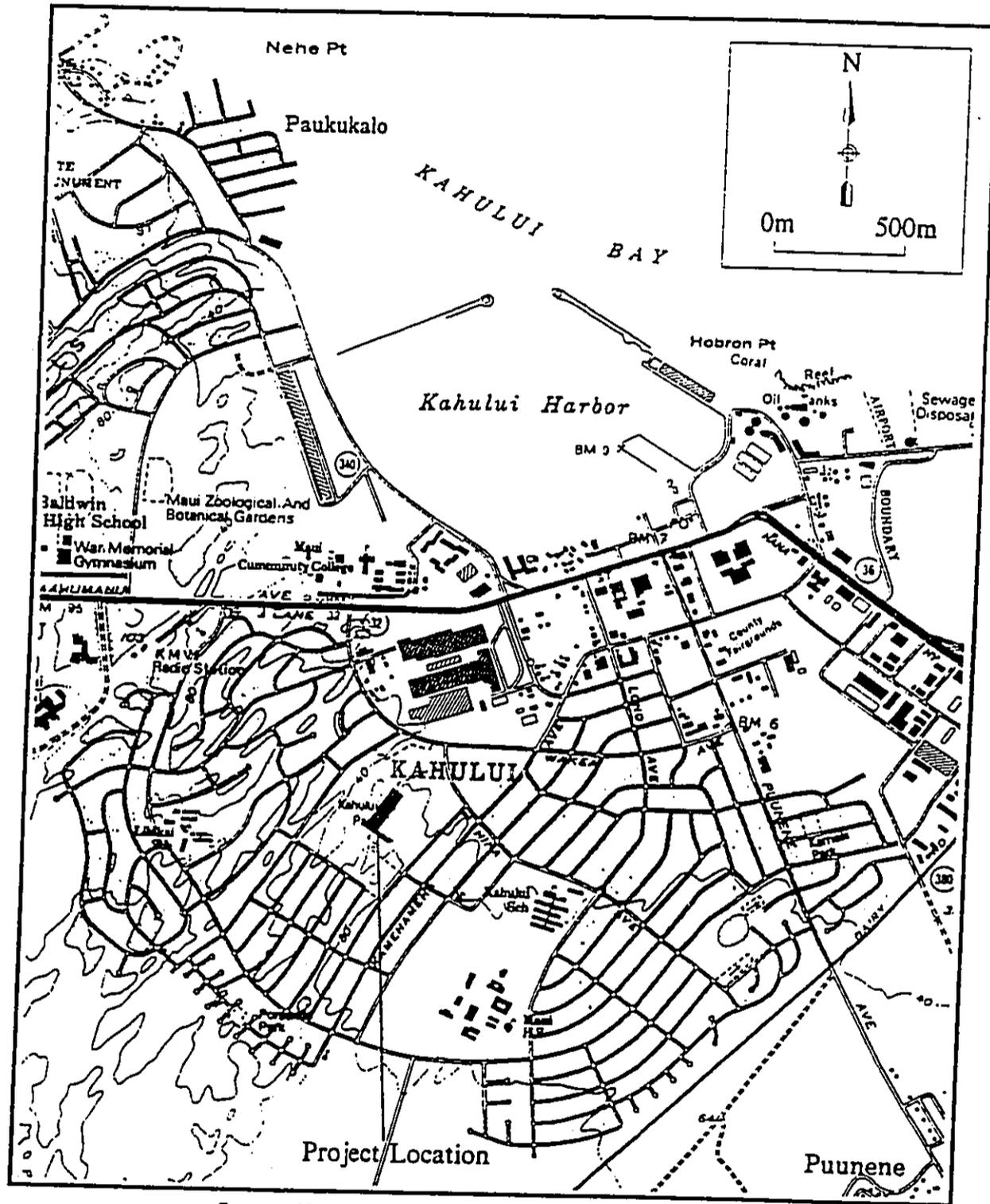
The irregularly shaped project area encompasses 2.41 acres. The property is to be an expansion to the existing Hale Makua. On its western border are the existing Hale Makua facilities; the other boundaries adjoin Kahului community park. It is an area of rolling sand dunes dissected by small natural drainages which only flow intermittently. Portions of the proposed project area have already been developed with the building of the park, a bike path, and the surrounding commercial buildings. A pile of burnt trees in the northern section of the project area indicates previous clearing of a small portion of the project area. A rough track running through the project area is probably the result of previous construction at Kahului Park. No other indications of disturbance were noted in the project area and much of the property consisted of a relatively undisturbed sand dune.

Map 1: Project Location on a Map of Maui



Archaeological Consultants of Hawaii, Inc. 1992

Map 2: Project Location on a U.S.G.S. Topographic Map



Source: U.S.G.S. 7.5 Minute Series (Topographic), Wailuku Quadrangle 1983

Average annual rainfall on the property is less than 20 inches (Armstrong 1973:56). Discontinuous clumps of pili grass (Heteropogon contortus) accounted for ninety percent of the floral cover; 'ilima (Sida fallax), kiawe or mesquite (Prosopis pallida), and haole-koa (Leucaena glauca) accounted for the remaining ten percent of vegetative cover.

Soils consisted of fine, well rounded, mixed calcareous and basaltic sands. According to Foote et al. the soils should be characteristic of the Puuone sand series (1972:117 and Sheet 99). Small amounts of slightly loamy sand were present in the upper few centimeters of the stratigraphy in some places. The loaminess of these deposits was almost certainly a product of A-horizon development within the sands. The soils are discussed in more depth below (refer to Section 7).

Section 3: HISTORICAL BACKGROUND

Wailuku District includes the entire eastern flank of the West Maui Mountains, and all of the flat land on the isthmus between West and East Maui, including the coastal portions of Kahului and Maalaea bays (see Map 1). Wailuku Ahupua'a is a relatively large political and economic land unit of Wailuku District, comprising nearly half of its land area; it includes the coastal area of Kahului Bay from Kapukaulua to Paukukalo, all of 'Iao Valley, and the northern half of the isthmus between Haleakala and the West Maui Mountains.

Early references to Wailuku note it as a gathering place and residence of important chiefs and their retinues (I'i 1959:135). This section details the land use history of the eastern portion of the ahupua'a of Wailuku. For a detailed account of the land use history of the western portion of the ahupua'a see Kennedy et al. (1992).

Section 3.1: Pre-European Contact History

In chants recorded by Fornander in the mid-1800's occasional references to Wailuku can be found. Maui place names are listed within the tradition of Lonoikamakahiki, where Wailuku Ahupua'a is numbered tenth, as one of the divisions of Wailuku District. Other placenames listed as divisions of Wailuku include Nuailua, Makaiwa, the uplands of Halehaku, and Waipio; all of which are located on the windward coast of Haleakala, at a considerable distance from the Wailuku District of the late prehistoric period. In several chants, Wailuku is referred to as a locality of flying and sometimes dark clouds, a sheltered and shady valley locale, the place of an iaiki rain, and a "broad plain where councils are held." (Fornander in Silva n.d.:3-7). In legends, Wailuku is remembered as a burial place of

In legends, Wailuku is remembered as a burial place of chiefs, and an area of much warfare. In one tradition, Wailuku takes its name from a legendary battle fought between owls and men. A cruel act was committed by a man and the owls punished him by flocking to Wailuku and descending upon him. The battle place is called Wailuku, (literally, "water of destruction") (Pukui-Curtis 1974:179 in Silva n.d.:9).

In another tradition, Wailuku is the name of a chiefess of the ancient past. In the legend of Lepeamoa, Mauinui (the high chief of Maui) challenged his brother-in-law, an Oahu chief, to a cockfight:

"As Mauinui possesses a rooster of extraordinary powers, he fully expects to win. At his urging the stakes were set exceedingly high; to the winner belongs the privilege of claiming all property and the life of the opponent. Kakuhihewa, however, is able to enlist the help of two demi-gods, Lepeamoa and Kauilani, and they assure his victory. Kakuhihewa then refuses his right to take Mauinui's life and his island and peace between the dominions of Maui and Oahu are established." (Westervelt 1973:204-245, in Silva n.d.:7)

In another story about ancient times, Wakalama, principal chief of the windward side, lived in Wailuku. He rescued five foreigners from a shipwreck, and took them into his court. One foreigner had an extraordinary sword, and became a captain of Wakalama's warriors. In a battle between Hawaii and Maui, this sword was taken by warriors from Hawaii Island. This sword became known as "the lost knife of Wailuku", and was eventually bartered for the return of the High Chief of Hawaii, captured and held captive in Maui (Kalakaua 1975:177-205).

An early Chief of Wailuku, Hua, was known for his wickedness and detested by his people. During a period of severe drought, he died of starvation. When he fell, his people allowed his bones to be bleached in the sun and rattle in the wind. This is the origin of a saying, "The bones of Hua rattle in the sun." (Fornander 1918-19:V:516, in Silva n.d.:8)

In the 16th century two major fresh water fish ponds were reportedly constructed near Kahului; Kanaha and Mau'oni. The date for the construction of the ponds is based on a story related by Kamakau (1961:42):

"Keawe-nui-a'Umi sailed from Hilo to Kapu'ekahi in Hana and from Hana to Kahului of Wailuku. There the chief of Hawaii met Kiha-a-Pi'i-lani, ruler of Maui. Kiha-a-Pi'i-lani was building walls of the pond of Mau'oni. A wide expanse of water lay between Kaipu'ula and Kanaha, and the sea swept into Mau'oni."

Fornander (in Walker 1931) suggests that Kiha-a-Pi'ilani lived around 1550, thus giving the sixteenth century date. The ponds may have been expanded or modified in the early eighteenth century by Ka-pi'i-oho-o-ka-lani, an Oahu high chief, who named the ponds after his children (Summers as quoted in Kikuchi 1973).

The Kanaha pond is still in existence today and is an important wildlife sanctuary, being a critical habitat for the endangered Hawaiian stilt. Mau'oni pond was not noted on a 1903 Hawaiian Government Survey map (Dodge 1885), nor on any subsequent maps examined.

During the seventeenth and eighteenth centuries, a period of frequent warfare within and between Maui, Oahu, and Hawai'i islands, Wailuku was the center of political and military power on Maui. High Chief Pi'ilani, who had unified the districts of Maui by war, had two sons, Lono-a-Pi'ilani and Kiha-a-Pi'ilani, who fought for political control of the island after the death of their father (Speakman 1978:9).

Two battles fought at Wailuku involved Kiha-a-Pi'ilani. The first was fought in 'Iao Valley, and Kiha-a-Pi'ilani barely escaped alive. The second battle was fought with the assistance of Hawai'i Island warriors, and Kiha-a-Pi'ilani was victorious, eventually becoming ruler of Maui (Thrum 1923:77-86, in Silva n.d.:9).

Around 1700 one chief, Kekaulike, a descendant of the Pi'ilani chiefs, established through war a powerful and united 'kingdom' on Maui. In 1736 Kekaulike, residing at Kaupō and fatally ill, heard that Hawai'i Island Chief Alapa'i was preparing to attack Maui. Kekaulike and his retinue fled in his double war canoe to West Maui where they landed below Kula. The dying king was carried overland to Haleki'i Heiau near Wailuku. His body was burned, and his ashes tossed into 'Iao Stream, and his bones were hidden in a cave near Haleki'i Heiau. He was the last ali'i to be interred there (Speakman 1978:13).

Before he died, Kekaulike had designated one of his sons, Kamehameha-nui, as his successor. However, another son, Ka-uki, challenged his half brother and a battle for succession ensued. The major and final battle in this war took place at Pu'unene on the plains of Wailuku just south of Kahului. Ka-uki fought in alliance with the ruling chief of Oahu and although there was a great slaughter on both sides, peace was made and Kamehameha-nui's rule was confirmed. There then ensued a period of peace on Maui for over 30 years (Speakman 1978: 13 & 14).

During the reign of Kamehameha-nui's successor and brother, the powerful King Kahekili (from 1765 to 1790), warfare between Maui and Hawai'i became intense once again. Wailuku was the site of Kalanihale, the royal residence of Kahekili. In the mid 1770's, Kalani'opu'u of Hawai'i marched with his well trained (Alapa) forces towards Wailuku. Kahekili hid his defending troops in the sand dunes above Haleki'i Heiau, where they surprised Kalani'opu'u's warriors. A battle took place seaward of the sand dunes, and the Alapa were slaughtered (Speakman 1978:16-17). An account of this battle was published in "Paradise of the Pacific" in September of 1900. It included a description of Wailuku at that time, received from a native Hawaiian of "considerable age":

"The district was called Nawaieha (the four streams) and was famous throughout the group, not only for the magnificence of Kahekili's court but for the vastness of its products. The shores of Kahului harbor, from Waihee Point to Haiku, were surrounded with the grass huts of the fishermen and of those connected with the innumerable war canoes of the king. Myriads of coconut trees lined the beach from Kahakuloa to Wailuku, the trunks of many of which are found in the marshes at Wailuku at this day, the trees having been destroyed by a conquering army from Hawaii." (Paradise of the Pacific, Sept. 1900, in Silva n.d.:10)

Neither Handy (1940), nor Handy and Handy (1972) mention the Kahului area, or any area in the eastern portion of the ahupua'a, as being major areas for habitation or agriculture.

The Alaloa or 'Long Road' was a paved way that ran around the whole island and was built by Kiha-a-Pi'ilani in 1516 after his conquest and unification of the whole island. However, between Hamakua and Waiehu the road was located on the beach (Handy & Handy 1972). Thus there would be no traces of it within this section of the ahupua'a.

The pre-contact history of the ahupua'a indicates that the western portion of the ahupua'a supported the majority of the population and agriculture. The only mention of habitation sites in the eastern portion that could be found is that referring to the fishermen's huts fronting Kahului bay. Mention of place names in the eastern portion of the ahupua'a is also relatively rare. This pattern could reflect the environmental differences within the ahupua'a. The western portion is relatively moist and has permanent streams, while the eastern portion is drier with no permanent streams.

Section 3.2: Post European Contact History

The post-contact history begins with the arrival of Captain Cook off the north shore of Maui on November 26th, 1778. Cook was returning from his search for the north-west passage after visiting Kaua'i earlier in the year. He first sighted Maui off the Hamakua coast and headed north-west along the coast towards Kahului at a distance of approximately three miles offshore. Cook gave the following description of his encounters near Kahului:

"At Noon the coast extended from S 81 degrees E to N 56 degrees West, a low flat like isthmus bore S 42 degrees W the nearest shore being 3 or 4 Miles distant. ...Seeing some Canoes coming off to us I brought to: as soon as they got a long side many of the people who conducted them came into the Ships without the least hesitation. ...We got from these people in exchange for nails and pieces of iron a quantity of Cuttle fish: fruit and roots they brought very little, but told us they had plenty ashore, as also hogs and fowls. ...Having no doubt that these people would come off with produce the next day, I kept plying off all night and in the Morning stood close in shore. At first but a few people visited us, but towards noon we had the company of a good many who brought with them bread fruit, Potatoes, Tarra or eddy roots, a few plantains and small pigs, all of which they exchanged for Nails and iron tools; indeed we had nothing else to give them." (Beaglehole 1969: 474-5)

Captain Clerke, the captain of the Discovery, the ship accompanying the Resolution, made the following observations of the encounter:

"One of the Aree's or principal People came on board, and made me a present of 2 small hogs: one of his Attendants had 2 large, long Iron Skewers; I was not master enough of the language to learn the proper history of them, as where he got them ...but its pretty clear from them having them at all, either that their connections do extend to where European exchanges have taken place, or that Europeans have some time or other been in the neighbourhood." (Beaglehole 1969:475)

This first day off Maui, "five or six hundred" persons came out to the ships in canoes and began trading. On the second day, Cook brought his ships closer to shore and continued trading. Kahekili had heard from his brother Ka'eo, the ruling Chief of Kaua'i, of Cook's visit ten months earlier to that island; so, when he saw the tall ships approaching, he decided to pay Cook an official visit in his royal canoe. Kahekili, accompanied by ten lesser chiefs in red feather cloaks, approached the Discovery, and were

received by Captain Charles Clerke. Reciprocal presents were exchanged in the Captain's cabin, including Kahekili's red and yellow feather (i'iwi and mamo) cloak (Speakman 1978:22-25). The journals of Cook's expedition unfortunately do not give any description of the land in this area.

By 1786 Kahekili controlled Maui, Moloka'i, Lana'i and Oahu. He also had an agreement with Ka'eokulani, the ruler of Kaua'i. In 1790 Kamehameha launched his bid for control of all the Hawaiian Islands from Hawaii Island. He landed at Kahului and joined battle with the ali'i prince, the son of Kahekili who was waiting there. The defenders retreated into 'Iao Valley (Speakman 1978:52-54). It has been reported that the name Kahului means 'the gathering place' and became attached to this area as a result of Kamehameha gathering his forces there (Burns 1991:47).

The battle of Kepaniwai (literally, "damming of the waters"), was a massacre of Maui forces by Kamehameha I and his warriors from Hawai'i. The Maui forces were led by Kalanikapule, son of Kahekili, and the Hawaii forces were accompanied by John Young, Isaac Davis, and a cannon. This was the first battle in Hawai'i in which gun powder was used. During the battle, women, children, and the elderly were sent up the side of 'Iao Valley where they looked down upon the slaughter. After the battle of Kepaniwai, Maui was added to the domain of Kamehameha the Great (Kamakau 1961:148).

The post-contact history of land use in this section of the ahupua'a is the history of the development of the sugar industry. The following account of that history is based on Speakman (1978) except where otherwise referenced.

The first commercial sugar production on Maui had begun at Wailuku in 1828 when two Chinese merchants established the Hungtai sugar works. Over the next half century, sugar production continued to develop in the western half of the ahupua'a, mainly centered on Wailuku and Waihe'e. Sugar production did not begin in the eastern portion of the ahupua'a until after the reciprocity treaty between Hawai'i and the United States became effective on September 9th, 1876, and after the arrival of Claus Spreckels. The treaty gave a great boost to sugar prices and production in Hawai'i and within five years exports of sugar had quadrupled. The higher prices allowed expansion of the industry into more marginal drier areas such as the eastern portion of the ahupua'a.

Exclusive ownership of land by the King had ended in 1847. A search of the native and foreign registers and testimonies showed that numerous Land Commission Awards (L.C.A.'s) were awarded in the western portion of the ahupua'a but none in the east. Portions of two L.C.A.'s were

located in this eastern section of the ahupua'a. L.C.A. #7713:23 was awarded to Princess Victoria Kamamalu. This L.C.A. represented the former ili of Kalua and consisted of 391 acres stretching from the town of Wailuku to include a small portion of the western part of Kahului bordering the bay. L.C.A. #420 took up the major part of the ili of Owa which was the land north of Kalua and stretched from Wailuku Stream in the west, to Kahului Bay in the east. This L.C.A. was awarded to Kuihelani whose claim derived from Auwae who had been konohiki. The testimony described a stone house and walls at the western end of the L.C.A. near Wailuku, but did not give any information about the eastern end near Kahului Bay. A large portion of land (24,000 acres) stretched from Wailuku in the west to Paia in the east and known as the Ka'a lands, or Wailuku Commons, was designated as crown lands. A description of these lands in the 1860's is contained in Burns (1991:72):

"The land around Puunene was a complete desert, a great, barren stretch of sand and dust spread from Wailuku to Paia, except for a little cattle grazing land around the present location of Spreckelsville."

Another description is given in Baldwin (1915:47):

"Central Maui was once a bare waste where little existed besides the prickly pear, the razor back hog and the wild indigo."

An 1882 map of Kahului Harbor (Monsarratt 1882) designated the area south of Kahului, including the subject property, as 'Wailuku Commons' and showed it to be vacant. Apparently this portion of the ahupua'a was designated as crown lands following the Mahele. The same map showed numerous L.C.A.'s further to the west in the vicinity of Wailuku and 'Iao Valley. The town of Kahului, itself, was depicted as consisting of about 20 buildings with E. Bailey and T. Hobron being the only names shown. Bailey was a missionary who had arrived in Maui in 1837, eventually settling in Wailuku, where he was involved in a wide range of activities including the manufacture of sugar in Wailuku. Hobron had set up a cane plantation at Waihe'e in the 1860's and was involved in running a schooner between Kahului and Honolulu. A wharf was shown on Monsarratt's map.

Spreckels developed a friendship with King Kalakaua, and through him secured purchase and lease in 1878 of 40,000 acres of the dry plains that make up the eastern portion of Wailuku Ahupua'a. Among the leased lands were the Wailuku Commons on which the subject property is located. Spreckels later used a contested claim to one half of the crown lands of all Hawai'i, which he had purchased from Princess Ruth Ke'elikolani for \$10,000, in 1880, as a bargaining tool to get control in fee simple of the Wailuku Commons in 1882 as

Grant 3343. He also secured water rights for the northern slope of Haleakela and the right to transport the water to his lands on the isthmus to irrigate the sugar cane. For this purpose he constructed a huge ditch which delivered 60 million gallons of water a day. King Kalakaua dismissed a cabinet which had held up the granting of these rights and in return Spreckels loaned the King \$40,000.

In 1882 Spreckels founded the Hawaiian Commercial and Sugar Company (HC&S). Meanwhile his cane fields on the isthmus were expanding so rapidly that they had outstripped the supply of water from the existing ditch. In the same year he leased water rights from the Waihee Sugar Company and constructed another ditch to bring water from the west Maui mountains to the isthmus. In the course of a few years Spreckels had totally transformed the landscape of Wailuku Commons. A state-of-the-art sugar mill was developed at a site near Spreckelsville and railways developed to bring the cane to the mill.

Concomitant with the development of the sugar industry in the ahupua'a was the rise of Kahului as a major port. As early as 1840 there may have been a small jetty about where the Maui Palms hotel is now located (Burns 1991:47). By the mid-1870's T. H. Hobron was running a schooner, the Ka Moi, between Honolulu and Kahului (Thomas 1983). Spreckels built a HC&S store, office, and shipping facilities at Kahului around 1877 (Burns 1991:47). In 1879 a small commercial landing was opened in Kahului for the sugar trade (Goodfellow 1991). Soon afterwards, Spreckels' Oceanic Steamship Lines began operating between Kahului and North America. Kahului was by far the major shipping point for the sugar from the Maui plantations. In 1904 Samuel Wilder built the first harbor breakwater wall at Kahului and had part of the bay dredged (Goodfellow 1991). Fill from the dredging was used to form the land on which the main business section now sits (Burns 1991:48). Even in 1914 Kahului was still the only port in Maui where a ship could tie up at a wharf and was therefore the cheapest port on Maui (Thomas 1983:133).

In 1881 the first commercial and passenger railroad in Hawai'i was founded by Thomas Hobron. It ran from Wailuku to Kahului and had its headquarters on the shore of Kahului Bay (Goodfellow 1991). The railroad expanded with the sugar industry over the years and continued its passenger service until 1936 (Schmitt 1977:425).

An 1885 Hawaiian Government Survey Map which was updated in 1903 (Dodge 1885) depicted the eastern portion of Wailuku Ahupua'a as being Grant 3343 to C. Spreckels. All of this area was designated as HC&S sugar plantation except the area immediately south and west of Kahului (which included the subject property) which was shown as vacant, sand dunes. Also shown on this map were schools at Kahului, Pu'unene and

south of Spreckelsville; and post offices at Kahului and Pu'unene. A mill was shown at Pu'unene and a reservoir near Pu'unene. The Pu'unene mill was built in 1900 to replace the Spreckelsville mill (Burns 1991:59).

An 1896 map (Howell 1896) of Kahului showed that the town had expanded substantially since Monsarratt's 1882 map but still not as far south-west as the project area. Buildings represented on the 1896 map included a wharf, a school, Kahului Railroad, the Kahului store of H.C.&S.Co., Maui Telephone office, Chinese and Japanese stores, shops, warehouses, a Customs House, a saloon, a fishery, a lumberyard, an office, and the Maui Soda Works. The fishery, Chinese and Japanese stores, school, church, and soda works were all added after the 1882 map (Jackson 1882).

In 1897 friction developed between Spreckels, whose HC&S owned all the land around Kahului Harbor, and Wilder, who owned the Kahului Railroad Company. Spreckels denied the railroad access to the port and Wilder in turn instigated legal proceedings. The situation was not resolved until 1899 when HC&S, then out of Spreckels control, bought the railroad. In the legal vacuum of these two years a squalid squatter's town sprang up and bubonic plague broke out in 1900. Kahului was burnt to the ground in order to control the plague outbreak. Modern Kahului dates from this time (Burns 1991:48).

The 1922 HTS & USGS Survey Map (Paia and Kihei Quadrangles) shows the area south and south-west of Kahului, including the subject property, as being vacant. Kahului, Pu'unene, and Spreckelsville are the only towns shown. Kahului has expanded since the 1896 map and two breakwaters are shown in the harbor. Throughout the eastern portion of the ahupua'a are scattered 13 sugar camps, many reservoirs and numerous railway lines used for hauling cane. The greatest concentration of camps is around present day Pu'unene with some being designated as Spanish, Portuguese, and Chinese. An alfalfa mill and a dairy are shown about half a mile south-east of Kahului.

In 1898 Spreckels lost control of HC&S, but even today the sugar plantation which he founded is still the principal land use in the area and the largest sugar producer on Maui. In 1942 the Government annexed 3,800 acres at Pu'unene and Kahului for the construction of naval air stations. The Kahului N.A.S. later became the site of the present airport.

In 1948 plans were unveiled by HC&S for the development of 'Greater Kahului' which was to occupy the "barren sand hills covered with kiawe" south of the existing town (Burns 1991:49). The goal was to provide the opportunity for company employees to own their own houses and to also sell fee simple lots to the general public to create a balanced

and unsegregated community. Kahului has continued to expand since the war as a commercial and residential center, and in the process has encompassed the project area.

During the historic period, Kahului has been subjected to a number of tsunamis. A 1923 tsunami destroyed the wharf at Kahului Harbor and inflicted \$1.5 million damage. An even worse tsunami was experienced in 1946. Other less serious tsunamis hit in 1952 and 1957. It would be safe to assume that the area was affected by tsunamis in pre-contact times, even though no references to these could be found in the oral history.

Section 4: PREVIOUS ARCHAEOLOGY

The earliest archaeology conducted in Wailuku was part of an island wide inventory of religious structures performed by Thrum (1906, 1909, 1917), Stokes (1916), and Walker (1931). Walker listed 16 heiau sites in the vicinity of the towns of Wailuku and Kahului, however, only two of these, both located in 'Iao Valley were extant at the time of his survey in 1929. Walker did note that there had been a heiau at Pu'unene which had been destroyed before his survey (Papanene Heiau).

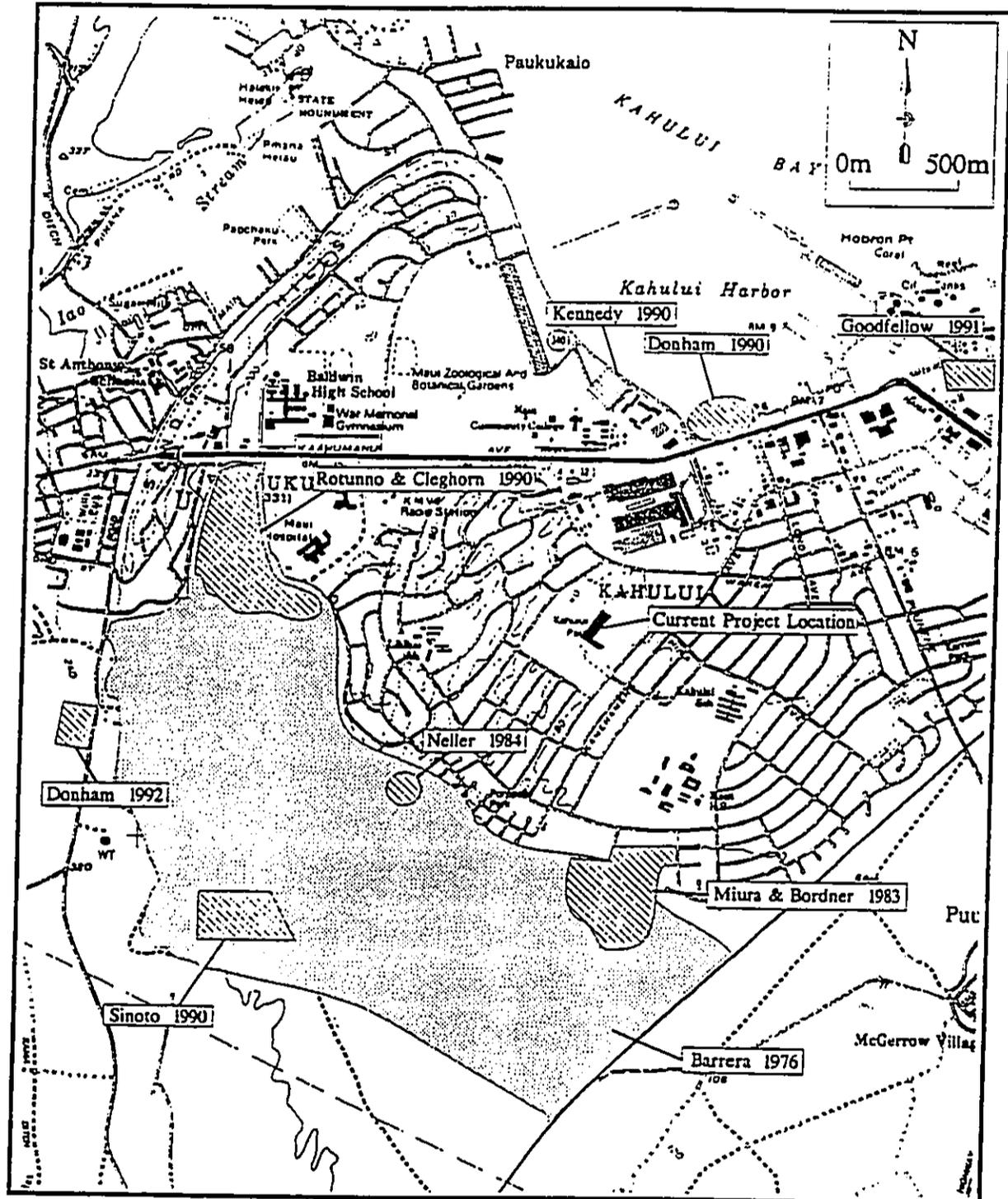
One site in the area, Kanaha and Mau'oni fishponds (State Site #50-50-05-1783) is known from traditional history (refer to Section 3.1). This site is located slightly inland from the coast and approximately 1.5 miles north-east of the project area. No archaeological investigations have been undertaken on the ponds.

A number of subsequent archaeological surveys and testing projects have been undertaken in the eastern portion of Wailuku Ahupua'a (see Map 3). None of these have covered the current project area.

The first such survey was conducted by Barrera (1976) and was a walk through surface survey of 1,020 acres at Waiale, about half a mile to the west of the current project area. Both areas consist of a similar sand dune environment. Barrera concentrated on disturbed areas in the hope of finding exposed sub-surface materials. No prehistoric cultural remains were found. Two artifacts, a piece of flaked basalt and a possible hammerstone were found in disturbed areas. It was noted that human skeletal remains had been previously found in cane fields to the south.

In 1981 Charles Keau surface surveyed Kanaha Beach Park and the Waste Water Treatment Plant fronting Kahului Bay approximately two miles north-east of the current project area. No evidence of sites was found.

Map 3: Previous Archaeological Studies in the Vicinity of the Project Location



Source: U.S.G.S. 7.5 Minute Series (Topographic), Wailuku Quadrangle 1983

Connolly (1981) conducted a reconnaissance survey at, and around, Kahului Airport. He spent only sixteen hours in the field. The area was divided into five zones, the first two zones were surveyed from a moving automobile, while the other three were surveyed on foot. Two sites were identified just north of the runway at the airport. One was an area where an undetermined number of burials had been unearthed during construction several years previously and then recovered. The other site consisted of two basalt stone alignments interpreted as a possible prehistoric house foundation.

A one day surface reconnaissance survey of a proposed housing development site in Kahului was undertaken by Environment Impact Study Corp. in 1983 (Miura & Bordner 1983). The site was located about half a mile south of the current project area. The site had previously been cleared and leveled for agriculture, and no prehistoric or historic cultural materials were observed.

In 1984 a human bone was recovered in sand shipped from a location within the area previously surveyed by Barrera in 1976. Earl Neller (1984) from the State Historic Preservation Office visited the sand mining site to try to locate the source of the bone. The remains of up to three individuals were located and one was identified as an Hawaiian juvenile male. This individual had been buried in a semi-flexed position.

A subsurface survey was conducted by International Archaeological Research Institute Inc. (I.A.R.I.I.) in 1988 at the mouth of Kaliialinui Gulch where it enters Kahului Bay and the beach fronting the gulch (Welch 1988a). This site is approximately two miles north-east of the current project area. Two test pits and 25 auger cores were dug. No archaeological deposits were encountered in any of the excavation units.

I.A.R.I.I. also conducted a surface survey at Kahului Airport over two days in 1988 in connection with planned development of the airport (Welch 1988b). The survey was conducted north of the runway with the primary purpose of re-identified the sites recorded by Connolly in 1981. The sites were re-identified and assigned the State Site #50-50-05-1798 and #50-50-05-1799. No other sites were identified.

Surveys were conducted in 1988 by Xamanek Researches on 232 acres of sugar cane land just south of Kahului Airport, but there was no evidence of archaeological features (Xamanek Researches 1988). The surface survey located material which was originally thought to be volcanic glass, but mechanical subsurface testing failed to reveal additional cultural materials. Subsequent analysis of the material indicated it was probably sugar cane slag (Stevenson 1989).

Xamanek Researches surveyed 34 acres in Spreckelsville in 1988 (Fredericksen et al. 1988). A surface reconnaissance and excavation of nine backhoe trenches failed to locate any archaeological sites.

In 1990 Rotunno and Cleghorn (1990) conducted a surface survey of a 1,000 acre parcel just half a mile to the west of the current project area in a similar sand dune environment. Two possible archaeological sites, a rock mound and a possible walkway, were found but these were thought to be of possibly recent origin.

Archaeological Consultants of Hawaii, Inc., conducted a subsurface testing program at a site 300m mauka of Kahului Harbor just half a mile to the north of the current project area (Kennedy 1990). Fifty-one backhoe trenches 12m long and 2m deep were excavated. No cultural remains were discovered. The absence of cultural materials was attributed to previous leveling of the coastal dunes.

Sinoto (1990) conducted a walk-through surface survey of 70 acres at the Mauni Lani sand borrow site which is approximately half a mile south-west of the current project area. No archaeological sites were discovered.

An inventory survey of 4.6 acres at the Maui Palms Hotel was undertaken by PHRI in June 1990 (Donham 1990). The survey consisted of a surface inspection and 40 auger cores which terminated at the water table, or impenetrable rocks, at depths up to 4.6m. One surface site and one subsurface midden site were found but both were interpreted as historic, secondary deposits which had been brought to the area as fill.

Another two subsurface testing programs were conducted at Kahului Airport in 1990 by I.A.R.I.I. (Welch 1991) and Cultural Surveys Hawaii (Folk and Hammatt 1991). I.A.R.I.I. excavated a total of 82 backhoe trenches, 20m apart and varying in length from 20m to 50m. No evidence of traditional Hawaiian occupation or burials was found in any of these trenches. The only historic artifact found was a 2m long section of railroad track which was presumed to have been part of a sugar plantation railroad that formerly ran through the area. Folk and Hammatt found no cultural remains in 16 test trenches they excavated.

Cultural Surveys Hawaii conducted intensive subsurface testing in the northern coastal section of Kahului Airport and Kanaha Beach park (Hammatt and Toenjes 1991). While they did not detect structural cultural remains they identified soil strata which they interpreted as cultural on the basis of their containing charcoal, artifacts, and marine midden; and their different soil color and compaction. The

excavations demonstrated a history of rapid beach accretion and dune development. The exposed cultural deposits all originated on an old beach surface now 300m to 400m inland from the present shoreline.

An inventory surface and subsurface survey was undertaken at a warehouse site immediately west of the airport and about a mile north-east of the current project site by PHRI in 1991 (Goodfellow 1991). Sixty per cent of the surface area was visible during the survey; the rest being concealed by vegetation. Twenty-five backhoe trenches 2m long, up to 1.85m deep, and spaced at 10m to 15m intervals were dug. No significant cultural remains were encountered.

Donham (1992) reported on the discovery of two burial areas at the Maui Homeless Shelter construction site located in the Wailuku sand hills about a mile west of the subject property. One area consisted of a flexed adult burial. The second area contained skeletal scatter representing two individuals, an adult female and a smaller adult. These areas were given State Site #50-50-04-2916. Neither subsurface features suggestive of burial pits nor portable remains were observed in conjunction with the burials. Donham mentioned the recent discovery of human skeletal remains in sand hills at the Kahului Intermediate School just half a mile west of the subject property and at the Mauni Lani Development area, three quarters of a mile south-west of the project area (State Site #50-50-04-2797).

Section 5: Land Use Patterns

The following summary of pre-historic and historic land use patterns in the eastern portion of Wailuku Ahupua'a is based on the mythological, ethnographic, historical, and archaeological data presented above.

While there is an abundance of evidence indicating that the western portion of Wailuku Ahupua'a was an important political, religious, population, and agricultural center in pre-contact times (see Kennedy et al. 1992), there is very little such evidence for the eastern portion of the ahupua'a. The only mythological and ethnographic accounts of the area are the description of Kahului Bay as being ringed by fishermen's huts in the mid-eighteenth century and a battle occurring at Pu'unene around the same time.

The large number of archaeological studies conducted in this section of the ahupua'a has given us little further evidence. The studies undertaken have centered in three areas; Kahului Airport and surrounding areas, the commercial district of Kahului, and the Wailuku sand dunes area which includes the suburbs of Kahului where the project area is located. In none of the three areas have any pre-historic

structural remains been found. In the airport area close to the coast, there is evidence of a prehistoric cultural layer on a former beach. This beach, or strand line, is now located several hundred meters inland from the sea, probably due to coastal progradation as a result of rapid beach accretion and dune development. In the Wailuku sand dunes area, human skeletal remains have been found at a number of sites, although no other cultural materials have been found associated with them.

Several recent studies have attempted to address the question of the paucity of archaeological sites in this area. In the light of the above review, a number of possible reasons can be advanced:

i) pre-contact settlement may have been restricted to the immediate coastal areas by the dryness and sandy soils of much of the interior portion of this section of the ahupua'a.

ii) the lack of structural remains in the sand dune areas could be attributable to the natural absence of basalt building materials. If people were living in these areas, their residences may have been made of less permanent materials.

iii) natural and human disturbances may have hidden or destroyed evidence of occupation, especially in the coastal areas. Much of the current land near the harbor consists of fill dredged from the harbor in historic times. Tsunami may have destroyed or covered evidence of occupation, and the progradation of beaches and the development of dunes may also have covered sites.

In post-contact times, the evidence points to limited use of this section of the ahupua'a until the development of the sugar industry. Sugar cane became the dominant crop in this area following the introduction of irrigation in the 1880's. The development of the sugar industry contributed to the development of Kahului as a port and residential area, and the founding of sugar towns such as Pu'unene and Spreckelsville. Sugar was grown everywhere except in the Wailuku sand dunes which extended for approximately eight miles inland from Kahului Bay. The subject property is located within these uncultivable dunes.

For the project area itself, there is no evidence of use until its incorporation into Kahului after World War Two. Previous archaeological work in the vicinity indicates that subsurface skeletal remains may be present in the sand dunes on the property but that there is a low probability of finding other cultural material.

Section 6: METHODOLOGY

An archaeological inventory survey with subsurface testing was conducted between August 12, 1992 and August 14, 1992. Joseph Kennedy, M.A., was the Principal Investigator. Ms. MA. Maigret, B.A., was the field supervisor, and she was assisted by Mr. David Soldo, B.A., and Ms. E. Heather Caldwell.

Upon arriving on site, the property boundaries were determined and the three corner markers which were present, were located. These were located in the S.E., S.W., and the N.W. corners of the property. The permanent markers were fixed with flagging tape. The three existent boundary markers served as reference points for locating the missing boundary markers.

An arbitrary datum was established on the property and designated as 1000N, 1000E. From this datum tape was pulled and a baseline was established along magnetic north. The baseline was flagged at ten meter intervals, forming the basis of a grid with units ten meters square. The northing and easting of the southwestern corner of each grid unit served as a reference point. The baseline extended from 882N, 1000E to 1028N, 1000E.

Portions of the proposed project area were determined to be ineligible for testing. They were areas that had been previously developed or impacted by the movement of heavy equipment. These areas included: the jogging path, a bike path which cut through the western one third of the project area, a previously developed area immediately to the south of the Hale Makua grounds, and areas previously disturbed by heavy equipment during the construction and development of the adjacent park and commercial buildings.

After establishing the project area boundaries, the baseline, and the areas ineligible for testing, an intensive surface survey was conducted. Members of the field crew were spaced at five meter intervals parallel to each other and they made pedestrian sweeps across the property until 100% of the surface had been examined. Areas of dense vegetation were investigated more thoroughly.

Mechanical trenching was conducted using a John Deere model JD 410 rubber wheeled backhoe. The trenches were excavated arbitrarily into the portion of the property eligible for testing, in order to ensure the greatest coverage of the intact dune deposit. Each trench was approximately 70cm (centimeters) wide, and varied from 2m (meters) to 3m in depth. All mechanical trenching was monitored. Due to the lack of surface cultural indicators, random screening of the back fill at arbitrary distances, not exceeding five meters, was performed. This material was

passed through a 1/8 inch screen. In the event that any subsurface features or deposits were encountered, all back fill from the area would have been screened regardless of the distance from previous screenings. Soil samples were taken from every stratigraphic layer observed in each trench. Stratigraphic profiles were drawn for each of the trenches except Trenches 2, 7, 8, and 9. The stratigraphy in the trenches for which profiles were not drawn, was similar to that in trenches for which profiles were drawn.

Section 7: ARCHAEOLOGICAL FINDINGS

The soils encountered during subsurface testing were characteristic of the Puuone soil series as described by Foote et al. (1972:117), although many of the layers were slightly darker than would be expected. Three layers were recorded during test trenching. Each of the layers was a mixture of pale brown calcareous sand and black basaltic sand. The overall color of the mixed deposit was used for descriptive purposes and to differentiate between deposits. These deposits were:

- Layer I: consisted of a loose, very finely grained sand, which was nonsticky, nonplastic, friable and soft. The colors varied from grayish brown (Munsell color: 10YR 5/2) to brown (10YR 5/3) to yellowish brown (10YR 5/4). In places along the surface, this deposit was slightly loamy, no doubt due to the partial development of an A-horizon.
- Layer II: consisted of slight to medium compacted, fine grained sand. The sand was nonsticky, nonplastic, friable and soft. The color of this deposit was dark yellowish brown (10YR 4/4).
- Layer III: was a heavily compacted, fine to medium grained sand. The sand was nonsticky, nonplastic, friable and soft. The color of the deposit was dark yellowish brown (10YR 3/4).

Some deposits of each of these layers contained cemented laminae which formed bedding planes within the sand dune. In other deposits there were concretions of cemented sand occurring as clasts within the sand matrix.

The soil descriptions should be used as a key to understanding the profiles and the trench descriptions. If more than one outcrop of a soil layer was present in a given trench, the layers would be distinguished by hyphenated letter suffixes which increased in value with depth of occurrence.

Test Trench 1 was excavated on a small flat sandy area on the western edge of the proposed project area (see Map 4). The total trench length was 15m. The depth of the trench varied from 1.5m to 2.5m. The surface was sandy with no vegetation growing in the area. A single soil deposit was observed in this trench, Layer I, a brown sand (10YR 5/3) which extended from the surface to the limit of excavation at 2.5mbs (meters below surface) (see Figure 1). Portions of this deposit had been cemented into distinct laminae.

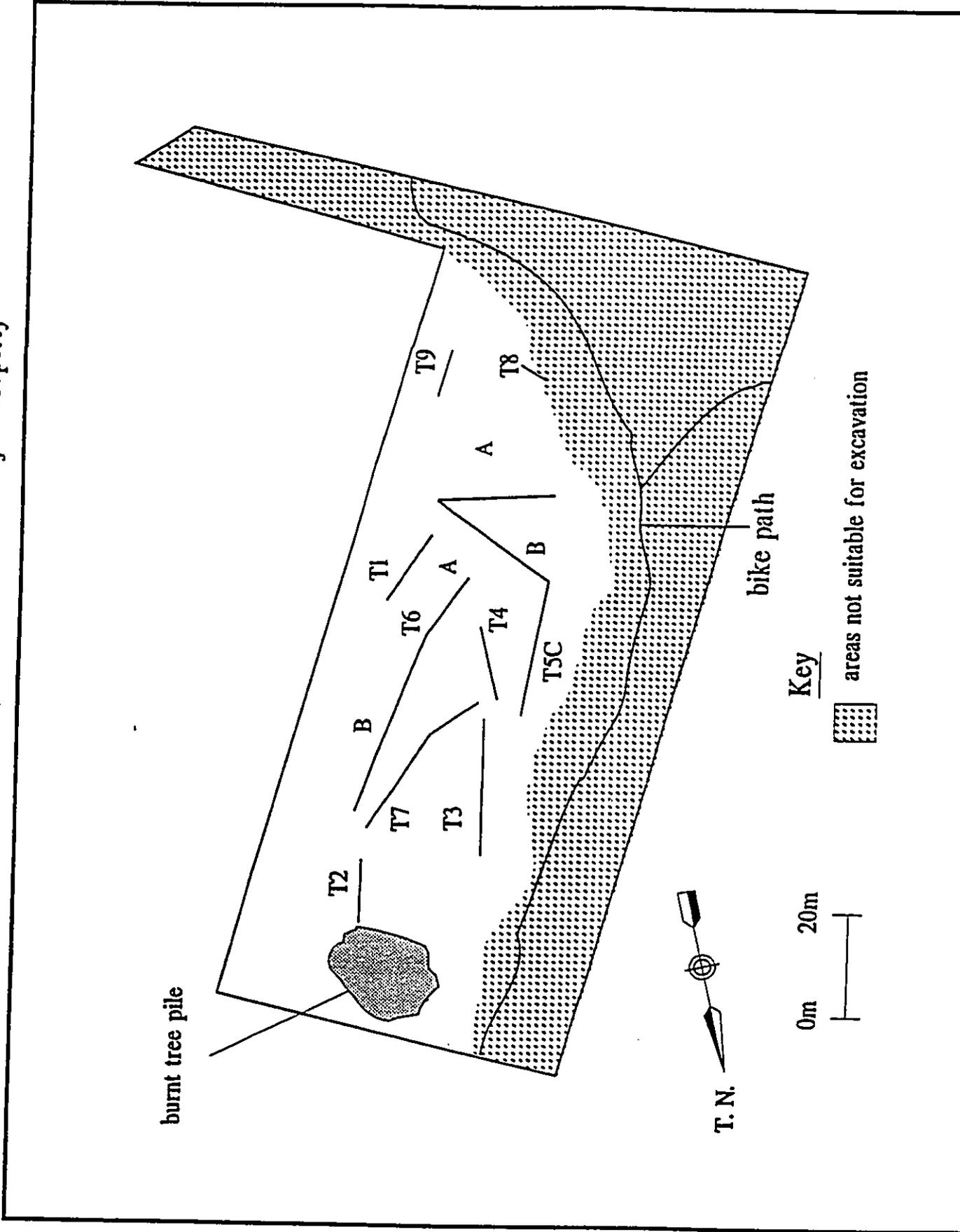
Test Trench 2 was located in the northern portion of the proposed project area immediately to the south of a large pile of burned kiawe trees (see Map 4). Trench 2 was 12m long. The depth of Trench 2 ranged from 2m to 2.5m. The ground surface was covered with 'ilima grass. No charcoal flecking was noted on the surface or in the trench walls, which was surprising due to the close proximity of the burned kiawe trees to the north. The stratigraphy in Trench 2 was homogeneously Layer I, a grayish brown sand (10YR 5/2), which extended from the surface to the base.

Test Trench 3 was located on a fairly flat sandy plain on the western edge of the area of the property which was determined as eligible for testing (see Map 4). Immediately to the east was a cut bank that appeared to have been the result of the construction of the bike path. The total length of this trench was 26m. Sparse grasses covered the ground surface. Three soil deposits were observed in this trench (see Figure 2). The upper deposit, Layer I, was a brown sand which extended from the surface to approximately 1-1.5mbs. Portions of this deposit contained cemented laminae. Layer I was underlain by Layer II, a dark yellowish brown sand. Within Layer II there were lenses of a slightly darker sand deposit, labeled as lens (i).

Test Trench 4 was located on a small hillock just to the west of a track created by previous construction on the neighboring property (see Map 4). The total length of the trench was approximately 14m. The ground surface was a loose sand with no vegetation. Two layers were observed in the profile of Trench 4 (see Figure 3): Layer I, a yellowish brown sand, extended from the surface to 80cmbs; and Layer II, extended from 80cmbs to the limit of excavation at 2.25mbs.

Test Trench 5 was located on a fairly flat area immediately to the east of the previously mentioned track, and to the west of a cut bank created by the construction of the bike path (see Map 4). Ground cover included assorted grasses and small kiawe trees. The trench was excavated in a zig-zag pattern to allow maximum coverage between the track and the cut bank. The zig-zag pattern created three sections which were labeled A, B and C, from south to north: Section A was 20m long; Section B was 23m long; and Section C was 26m long.

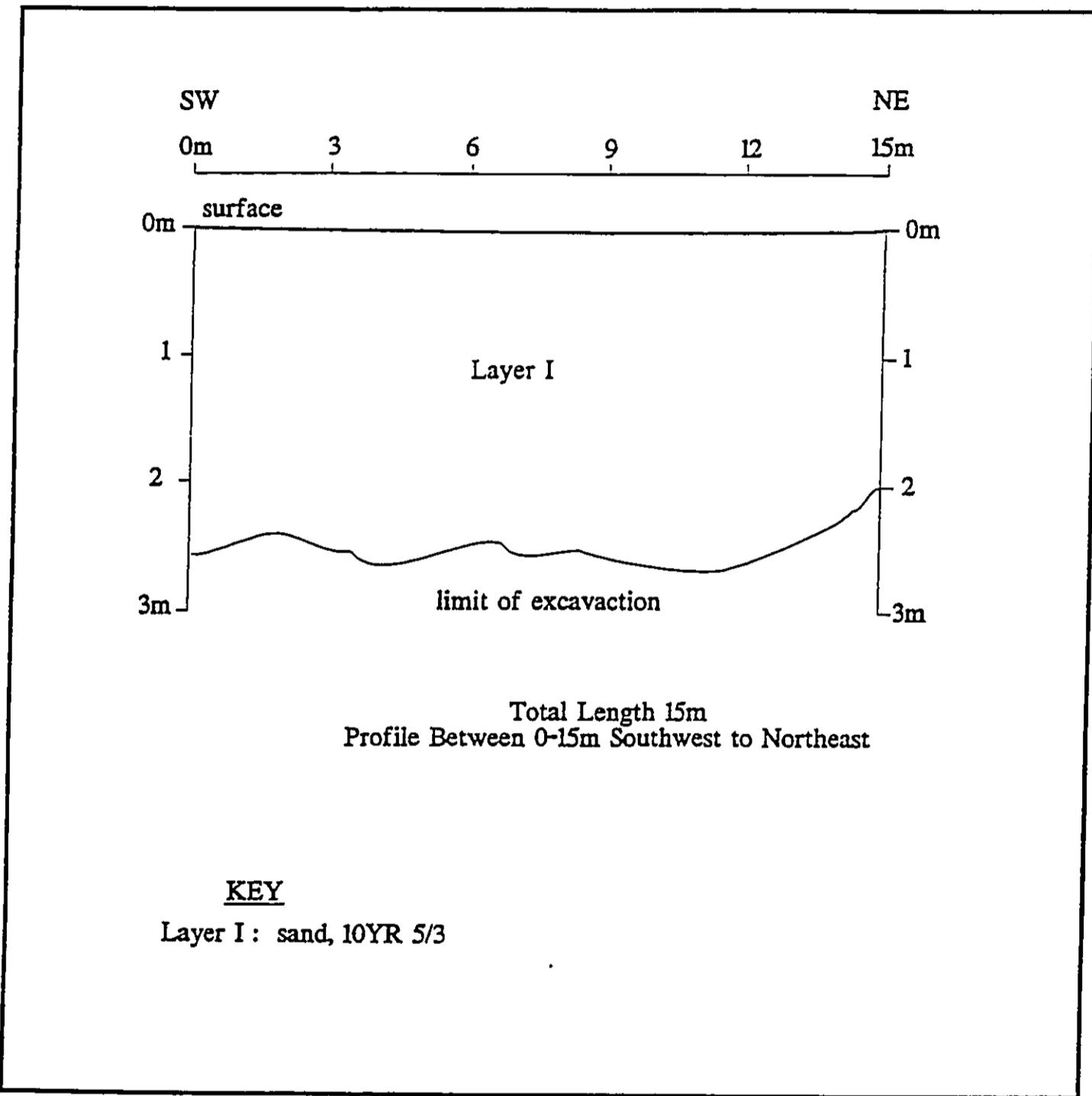
Map 4: Trench Locations on the Subject Property



TMK: 3-8-07; portion 97; Wailuku, Maui

Archaeological Consultants of Hawaii, Inc. 1992

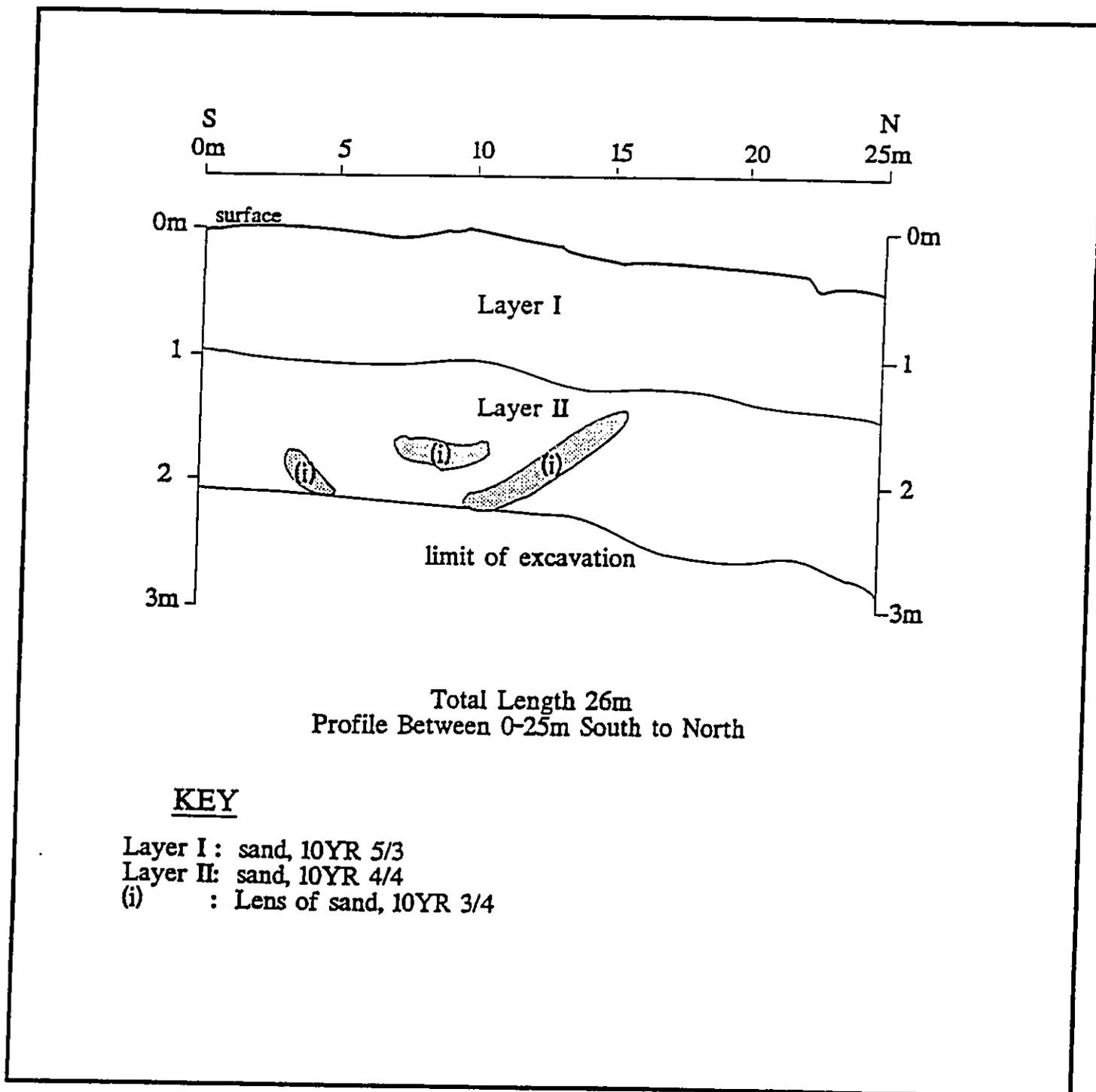
Figure 1: Trench 1 Profile, Northwest Face



TMK: 3-8-07; portion 97; Wailuku, Maui

Archaeological Consultants of Hawaii, Inc. 1992

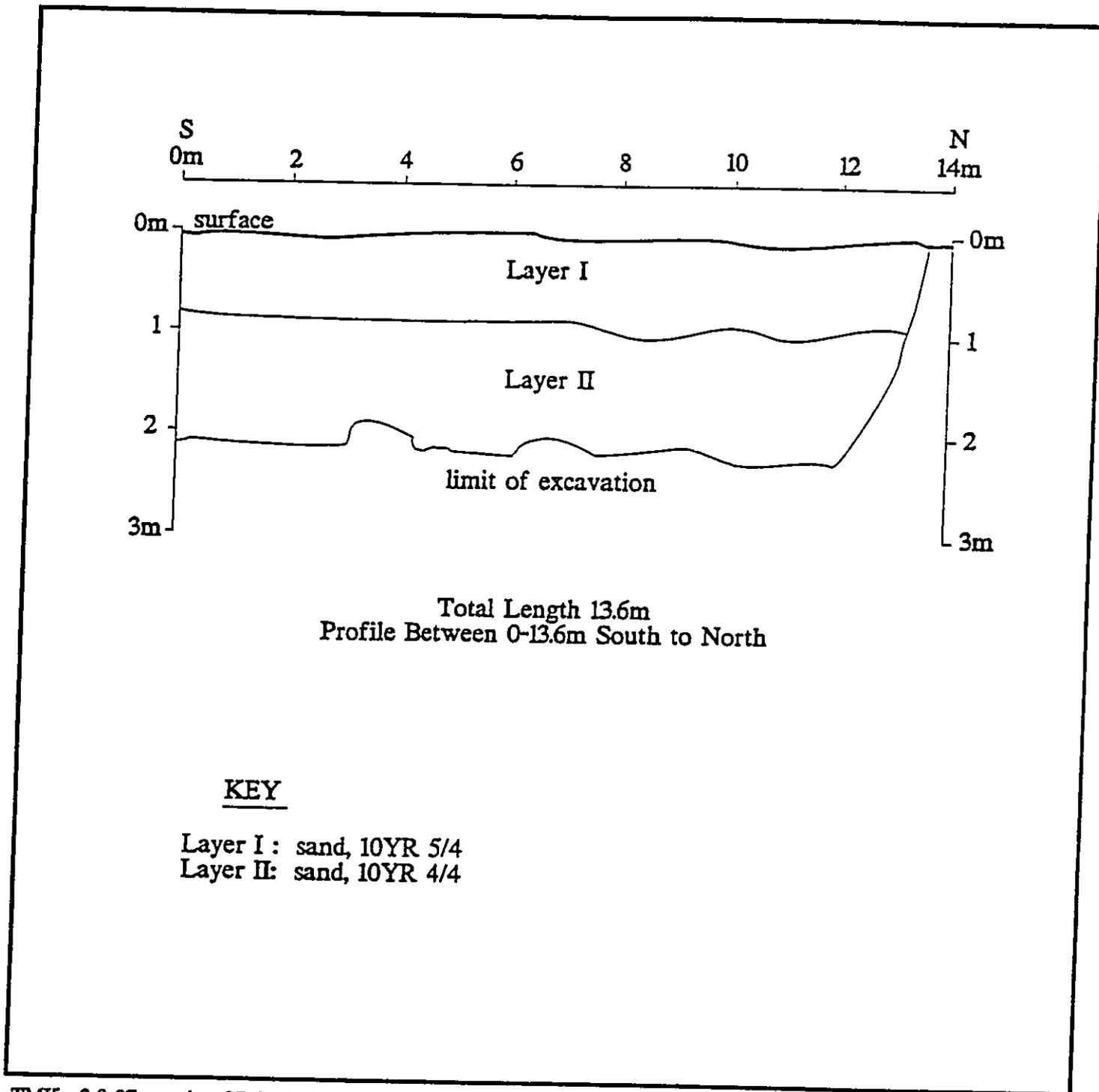
Figure 2: Trench 3 Profile, West Face



TMK: 3-8-07; portion 97; Wailuku, Maui

Archaeological Consultants of Hawaii, Inc. 1992

Figure 3: Trench 4 Profile, West Face



TMK: 3-8-07; portion 97; Wailuku, Maui

Archaeological Consultants of Hawaii, Inc. 1992

In total, Trench 5 measured 69m long. Two soil deposits were present in this trench: Layer I-1 was a brown sand; and Layer I-2 was a yellowish brown sand (see Figure 4). Much of Layer I-1 was cemented into laminae which formed bedding planes.

Test Trench 6 began downslope of a small hillock, and continued upslope to the top of the hillock onto a slightly sloping sandy plain (see Map 4). The total length of Trench 6 was 48m. Trench 6 had a slight bend forming two sections labeled A and B. The average depth of the trench varied from 2mbs to 2.1mbs. The ground cover was composed of assorted grasses. Two layers were observed in the trench profile (see Figure 5): Layer I was a brown sand; and Layer II was a dark yellowish brown sand.

Test Trench 7 was situated between Trench 2 and Trench 3 on a slightly sloping sandy plain directly to the south of the burnt tree pile (see Map 4). The total trench length was 30m. Dense grasses and small trees made up the ground cover. Two layers were present in the trench: Layer I was a brown sand (10YR 5/3) extending from the surface to 80cmbs; and Layer II was a dark yellowish brown sand (10YR 4/4) which extended from 80cmbs to the base of excavation at 1.8mbs.

Test Trench 8 was excavated at the edge of a cut bank created by the bike path (see Map 4). This location allowed a deep cross-section of the deepest undisturbed dunes in the project area. The total length of the trench was 4.5m. A single soil deposit was observed: Layer I which extended from the surface to a depth of 2.8mbs. Layer I was a yellowish brown (10YR 5/4) sand.

Test Trench 9 was situated in a small grove of trees in the southwestern corner of the project area (see Map 4). The total length of this trench was 9m. A single layer was present which extended from the ground surface to 1.8mbs, the base of excavation. Layer II was a dark yellowish brown (10YR 4/4) sand.

Section 8: DISCUSSION

From a review of the previous archaeological studies in the area, it was thought probable that the most likely finds on the subject property would be human burials. It is common for human burials to be found in coastal sand deposits, not only along this section of the Maui coast, but throughout the Hawaiian Islands. The likelihood of finding burials was a consideration because of the relatively intact dune deposit on the property.

Figure 4: Trench 5 Profile, Sections A and B

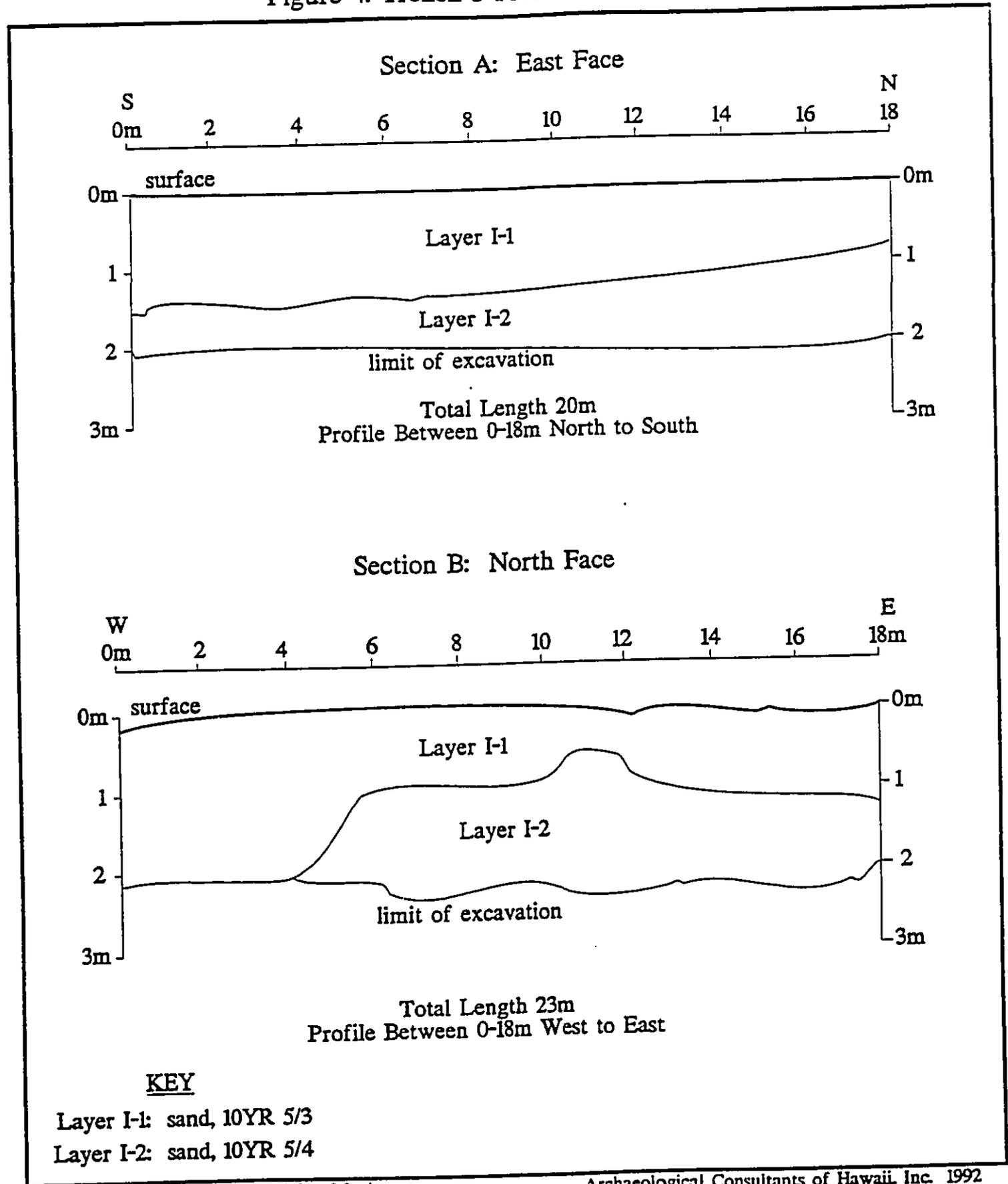
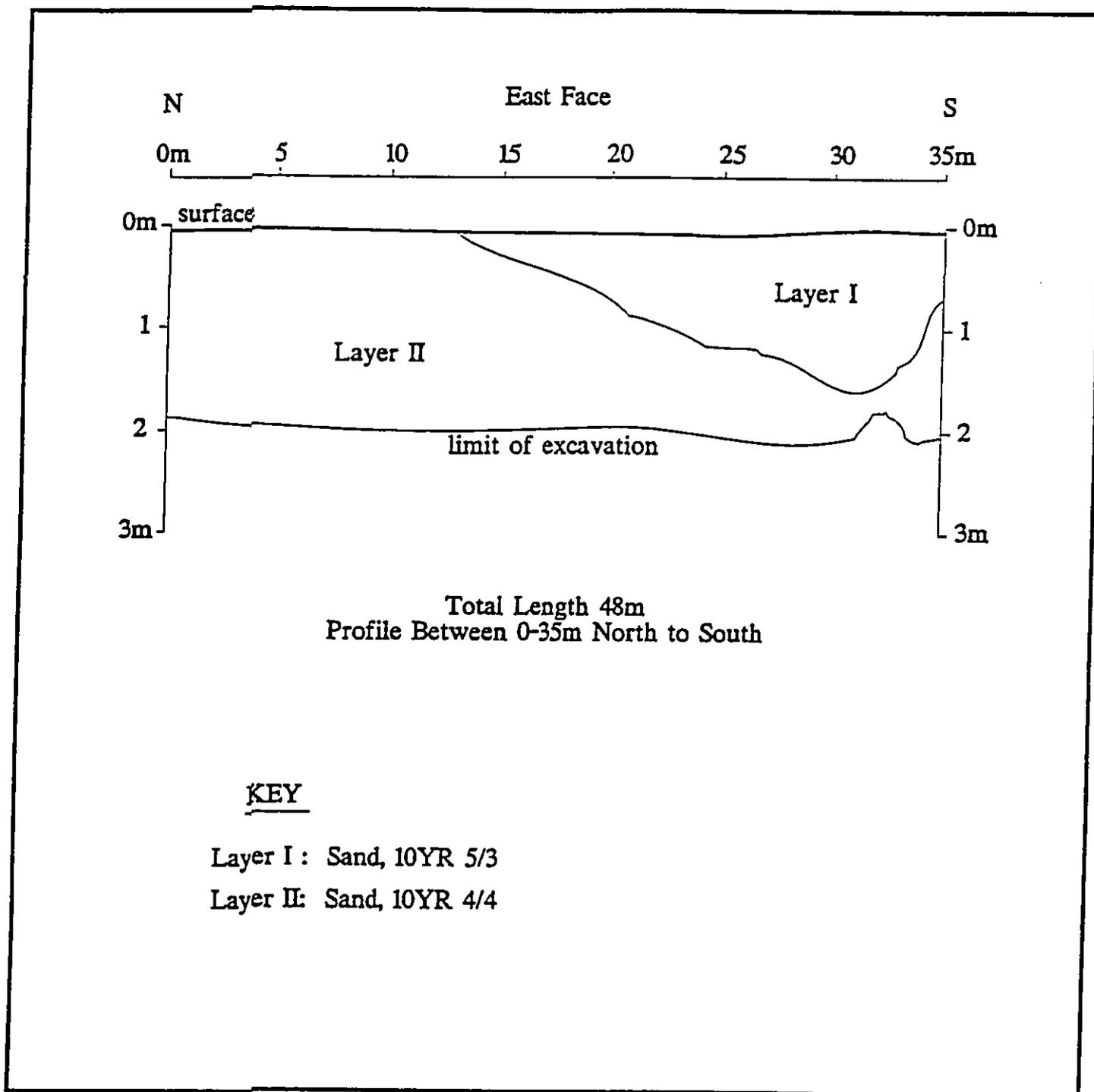


Figure 5: Trench 6 Profile, Section A



TMK: 3-8-07, portion 97; Wailuku, Maui

Archaeological Consultants of Hawaii, Inc. 1992

The excavations on the subject property did not encounter human remains in the sand dune. Indeed, no features or deposits of historic significance were encountered on the subject property.

Section 9: CONCLUSION

An inventory survey with subsurface testing was conducted on the subject property. Neither the 100% surface survey, nor the nine test trenches, encountered any historically significant structures or deposits. A large portion of the project area had previously been impacted by the construction of Kahului Park, bulldozing on the subject property, and the construction of a bike path. Testing occurred in areas which had not been obviously disturbed. Any future construction activities on the subject property will have "no effect" upon significant historic resources.

The owner and developer should be aware that human burials have been encountered in sand dunes in the Kahului area. It is possible that the testing undertaken during the present investigations did not locate human burials which are present within the sand dune. In the event that human remains are encountered during construction activities, the State Historic Preservation Division should be contacted immediately, in accordance with HRS Chapter 6E.

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Appendix B

Preliminary Drainage Report

PRELIMINARY
DRAINAGE REPORT
FOR
HALE MAKUA-KAHULUI
KAHULUI, MAUI, HAWAII
TMK: 3-8-07-97

PREPARED FOR
HALE MAKUA
472 KAULANA STREET
KAHULUI, MAUI, HAWAII 96732

PREPARED BY
RICHARD M. SATO & ASSOCIATES, INC.
2115 WELLS STREET
WAILUKU, MAUI, HAWAII 96793
AUGUST 1992

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I. PROJECT LOCATION

The project site is located in Kahului, Maui, and lies in the heart of Kahului's residential district. The site over which the project will be built is part of the Kahului Community Center & Park grounds. The Kahului Community Center & Park is a huge parcel bordered by Wakea Avenue, Onehee Avenue, Hina Avenue, Uhu and Kaulana Streets. The site also abuts the existing Hale Makua Facility at Kahului and is a stone's throw from the Kaahumanu Shopping Center and the Pineapple Cannery to the north, and the Maui High School and the Kahului Elementary School to the south.

The site is a portion of a property identified as TMK: 3-8-07:97.

II. PROJECT DESCRIPTION

The Hale Makua at Kahului is a non-profit organization that provides health and nursing care to the aged and the elderly.

This project is an expansion of the existing Hale Makua facility at Kahului. The project includes construction of an additional eighty (80) bed care center, with an access driveway, paved parking, landscaping and utilities.

III. DRAINAGE

A. Existing Conditions

The project site is currently undeveloped. The site is overgrown with brush and kiawe trees. Slopes vary from 5 to 20% and soils are loose and sandy.

The site is a huge mound of dirt whose peak stands above the surrounding terrain. A paved bike path that winds through the park almost borders the limits of the site. A natural drainage channel exists 100 feet beyond the site. The channel runs through the Kahului Community Park to a sump located in the lower reaches of the park close to Wakea Avenue.

Drainage plans for Kahului indicate that much of the area bounded by Hina Avenue, Onehee Avenue and Papa Avenue drain into the sump.

Existing runoff from the project site sheet flows over the property and across the bike path to the existing drainage channel below. No offsite runoff drains through the property. Existing storm runoff is estimated at 2.4 cfs. (See Appendix A).

B. Developed Conditions

Existing drainage patterns will be maintained.

The new facility will develop and maintain its own drainage system. Only a small portion of the site, including the access driveway, will drain into the existing Hale Makua facility.

Flows from the proposed parking area as well as from the facility itself will be intercepted by catch basins and conveyed across the existing bike path via RCP culverts. Runoff will be directed to the existing drainage channel below the site.

All unpaved areas of the project site will be grassed and landscaped. Developed runoff from the new site is estimated to be 6.4 cfs.

C. Hydrologic and Hydraulic Calculations

Storm runoff calculations were prepared for a 1 hour storm with a recurrence interval of 10 years using the Rational Method for determining storm runoff. (See Appendix A). Tables and charts from the Drainage Master Plan for the County of Maui were referenced.

D. Conclusion

Much of the runoff from the new project will drain into the existing channel below the site. Culverts will be installed where flows cross the existing bike path.

Drainage patterns similar to those before construction of this project will be maintained. Storm runoff will increase slightly, however, flows will not significantly alter existing drainage conditions.

No adverse drainage impact will result to downstream or adjacent property from construction of this project.

IV. EROSION CONTROL

Estimated soil loss has been calculated using the Universal Soil Loss Equation in accordance with the County of Maui Grading Ordinance concerning control (see Appendix B).

Calculations show that a maximum of 4.4 tons/acre/year of soil may be lost during grading operations while 2070 tons/acre/year is the maximum allowable annual soil loss rate.

Normal soil erosion control measures during construction (see Appendix B). Should be sufficient for this project, with no excessive soil loss occurring.

V. APPENDICES

- A - HYDROLOGIC AND HYDRAULIC CALCULATIONS
- B - SOIL EROSION CALCULATIONS

APPENDIX A
HYDROLOGIC AND HYDRAULIC CALCULATIONS

APPENDIX A
 HYDROLOGIC AND HYDRAULIC CALCULATIONS
 FOR
 HALE MAKUA-KAHULUI

I. DRAINAGE RUNOFF CALCULATIONS

A. Existing Condition (10 Year, 1-Hour Storm):

1. Runoff Coefficient (c):

Infiltration (High)	=	0.00
Relief (Rolling)	=	0.03
Vegetal Cover (Poor)	=	0.05
Development Type (Open)	=	<u>0.15</u>
C	=	0.23

2. Runoff from New Facility

Area (A)	=	2.41 Acres
L	=	200 Feet
S	=	13%
T _c	=	9 Minutes
i ₁₀	=	2.0 inches/hour
I ₁₀	=	4.3 inches/hour
Q ₁₀	=	CIA = 0.23 x 4.3 x 2.41 = 2.4 cfs

B. Developed Conditions (10 Years, 1-Hour Storm):

Runoff from Developed Unpaved Area to RCP Culvert at Bike Path

1. Runoff Coefficient (c):

Infiltration (Med.)	=	0.07
Relief (Flat)	=	0.00
Vegetal Cover (Good)	=	0.03
Development Type (Residential)	=	<u>0.40</u>
C	=	0.50

2. Runoff from New Facility:

Area (A)	=	1.35 Acres
L	=	140 Feet
S	=	2.8%
T _c	=	13.5 Minutes
i ₁₀	=	2.0 inches/hour
I ₁₀	=	3.8 inches/hour
Q ₁₀	=	CIA = 0.50 x 3.8 x 1.35 = 2.6 cfs

C. Runoff from Developed Paved Parking Area:

1. Runoff Coefficient (c):

Infiltration (Negligible)	=	0.20
Relief (Flat)	=	0.00
Vegetal Cover (None)	=	0.07
Development Type (Industrial)	=	<u>0.55</u>
C	=	0.82

2. Runoff from Parking Area:

Area (A)	=	0.73 Acres
L	=	250 Feet
S	=	3%
T _c	=	5 Minutes
i ₁₀	=	2.0 inches/hour
I ₁₀	=	5.0 inches/hour
Q ₁₀	=	CIA = 0.82 x 5.0 x 0.73 = 3.0 cfs

D. Runoff from New Site into Existing Hale Makua Facility:

1. Runoff Coefficient (c):

Infiltration (Med)	=	0.07
Relief (Flat)	=	0.00
Vegetal Cover (Good)	=	0.03
Development Type (Residential)	=	<u>0.40</u>
C	=	0.50

2. Runoff into Existing Hale Makua Facility

Area (A)	=	0.33 Acres
L	=	150 Feet
S	=	5%
T _c	=	5 Minutes
i ₁₀	=	2.0 inches/hour
I ₁₀	=	5.0 inches/hour
Q ₁₀	=	CIA = 0.50 x 5.0 x .33 = 0.8 cfs

E. Total Developed Runoff from the Site:

$$Q = 2.6 + 3.0 + 0.8 = 6.4 \text{ cfs}$$

APPENDIX B
SOIL EROSION CALCULATIONS

APPENDIX B

SOIL EROSION CALCULATIONS

1. SITE CONDITIONS DURING CONSTRUCTION

An area of approximately 2.41 acre will be graded at once.

Soil within the project site is classified as Puuone Sand (PZUE). Characteristics of these soils are rapid permeability, slow runoff and the erosion hazard is moderate to severe.

2. HESL SOIL LOSS FOR THE PROJECT DURING CONSTRUCTION

Erosion Rate, as set forth by the County of Maui Ordinance:

$$E = R K L S C P$$

Where:

- E = Soil loss in tons/acre/year
- R = Rainfall factor = 150 tons/acre/year
- K = Soil erodibility factor = 0.10
- L = Slope Length = 140 Feet
- S = Slope Gradient = 2.8%
- Ls = Slope-Length Factor 0.29
- C = Cover factor = 1.0 Bare Soil
- P = Control Factor = 1.0 (Construction Site)

$$E = (150 \text{ tons/acre/year}) (0.10) (0.29) (1.0) (1.0) \\ = 4.4 \text{ tons/acre/year}$$

3. ALLOWABLE SOIL LOSS

Coastal Water Hazard (D) = 2 (Class "A" Water)
Downstream Hazard (F) = 4
Duration of Site Work = 1/2 Year
Maximum Allowable Construction Area x Erosion Rate =
5,000 tons/acre
Project Construction Area = 2.41 Acre
Maximum Allowable Rate = 5,000/2.41 = 2070 tons/acre/year

4. CONCLUSION

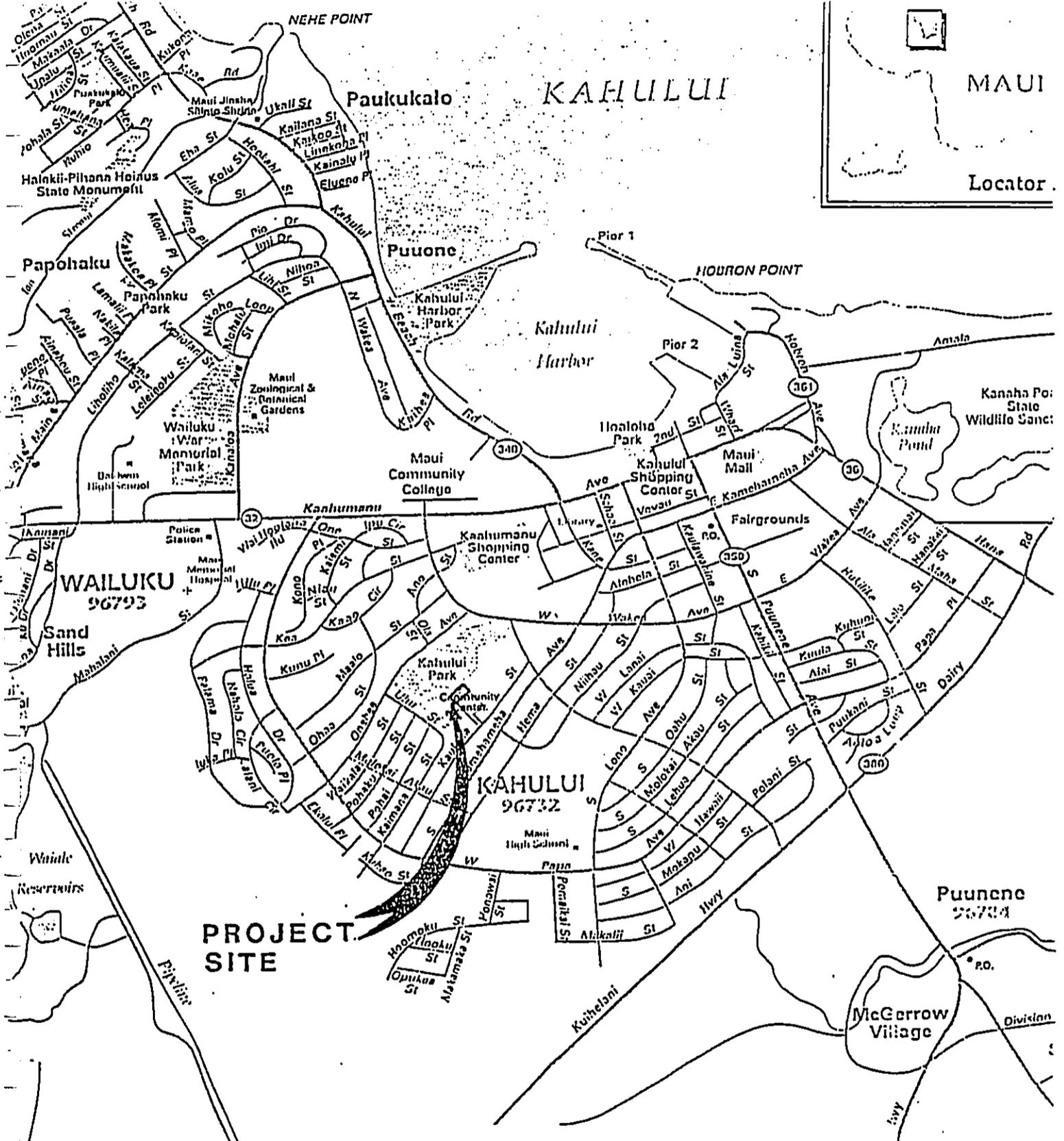
Maximum Allowable Erosion Rate of 2070 tons/acre/year is greater than the Estimated Construction Erosion Rate of 4.4 tons/acre/year. Normal soil erosion control measures during construction should be sufficient to prevent excessive soil loss from occurring.

5. EROSION CONTROL PRACTICE DURING CONSTRUCTION:

1. Minimize time of construction.
2. Dust control by temporary water sprinkler system or water wagons or both if necessary.
3. All exposed areas shall be protected immediately after grading is completed by grassing or mulching.
4. All exposed slopes (cut and fill) shall be protected by grassing and by constructing temporary swales at the top of slopes.

VI. EXHIBITS

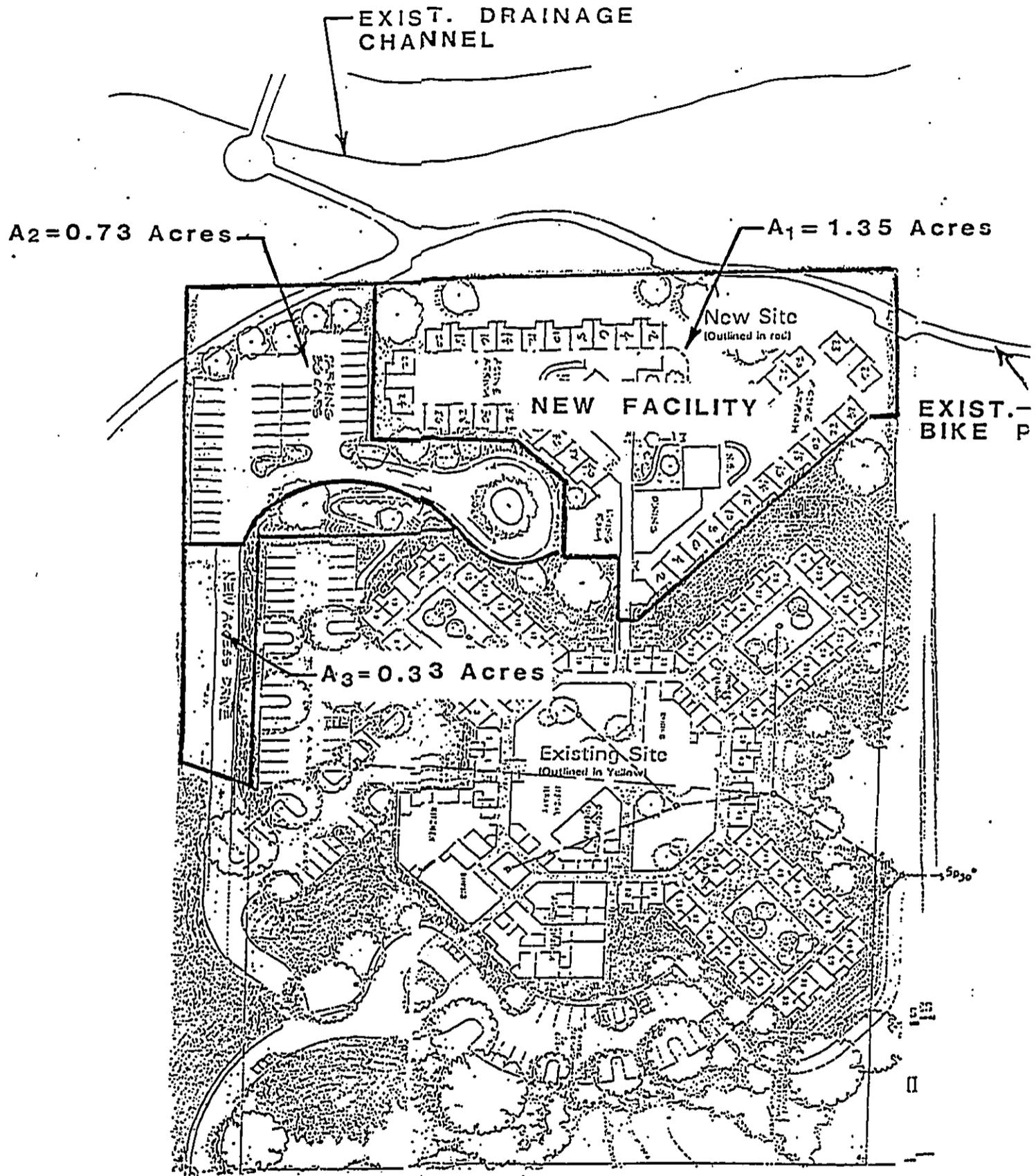
- A - LOCATION MAP
- B - SITE PLAN



LOCATION MAP
 SCALE: 1" = 2000'

EXHIBIT A

DOCUMENT CAPTURED AS RECEIVED



SITE PLAN

SCALE: 1" = 100'

EXHIBIT E

Appendix C

***Letters from DLNR State
Historic Preservation Division***

JOHN WAIHILE
GOVERNOR OF HAWAII



WILLIAM W. PATY, CHAIRPERSON
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HISTORIC PRESERVATION
DIVISION

LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

'92 SEP 16 10:47

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

September 14, 1992

Mr. Brian Miskae, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

LOG NO.: 6318
DOC NO.: 2502a

Dear Mr. Miskae:

SUBJECT: Historic Preservation Review of a Community Plan
Amendment and Change in Zoning Application for the Hale
Makua Expansion (I. D. No. 92/CPA-005, 92/CIZ-012)
Wailuku, Maui
TMK: 3-8-07: 97

This is a follow-up to our letter of August 4, 1992, concerning these applications. We have previously recommended that a decision on these applications be deferred until the applicant has conducted an archaeological inventory survey to determine whether significant historic sites are present.

On September 7, 1992, we received a draft copy of the final report presenting the results of an inventory survey that was conducted by Archaeological Consultants of Hawaii (Kennedy, Brennan and Soldo 1992. Inventory Survey with Subsurface Testing Report for a Property Located at TMK: 3-8-07:97 (por.), in the Ahupua'a of Wailuku, District of Wailuku, on the Island of Maui). We reviewed this report and it appears that the project area has been adequately surveyed and tested. It also appears that sufficient data from the background research and testing results were presented in the report.

Human burials were predicted to be present on the project area based on previous findings from the sand dunes in the surrounding area. However, no evidence of burials or other historic sites was found. We concur with this negative finding and we have determined that the proposed expansion of Hale Makua will have "no effect" on significant historic sites.

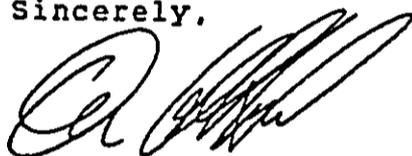
Brian Miskae
September 14, 1992
Page 2

However, there is still a possibility for an isolated burial to be encountered during massive grading of the dune. Therefore, we recommend that the following condition be attached to the permit, if approved:

- 1) An archaeologist shall monitor the grading of the dune. If a human burial is encountered, the remains shall be protected from further damage and the finding shall be reported to the State Historic Preservation Division (SHPD) immediately. The monitoring archaeologist shall undertake the mitigation measure as determined by SHPD. A monitoring report, whether or not historic sites were found, shall be submitted to SHPD.

Should you have any questions about these comments, please contact Annie Griffin at 587-0013.

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

AG:aal

JOHN WAIHII,
GOVERNOR OF HAWAII



'92 AUG -6 P1:23

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

August 4, 1992

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION

DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

LOG NO.: 5880
DOC No.: 2417a

Mr. Brian Miskae, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Dear Mr. Miskae:

**SUBJECT: Historic Preservation Review of the Community Plan
Amendment and Change in Zoning Application for the Hale
Makua Expansion (I.D. No. 92/CPA-005, 92/CIZ-012)
Wailuku, Maui
TMK: 3-8-07: 97**

Thank you for the opportunity to comment on Hale Makua's request for 2 acres of County land to expand its facility.

Our Staff Archaeologist on Maui, Ms. Theresa Donham, conducted a field inspection of this 2-acre property on July 30, 1992. Based on an oral report from Ms. Donham, this property consists of a relatively undisturbed sand dune, which at its highest point is higher than the roof of the existing Hale Makua facility. Areas with no ground cover were inspected, and no historic remains (bones, artifacts, charcoal or shells) were observed. Although there are no known burials on this parcel, scattered human burials have been found in the sand dunes in the general vicinity of the project area. These were found in very low density, and in some cases were isolated individuals. It is likely that isolated burials are also present in the sand dune on this property. Thus, it is possible historic sites are present, although perhaps in low density.

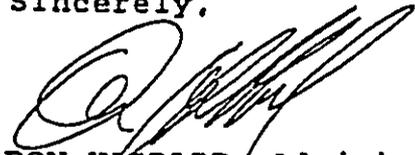
Given this information, we recommend that a decision on this application be deferred until systematic archaeological subsurface testing, preferably by backhoe, is conducted to determine if significant historic sites (particularly burials) are present, or

Brian Miskae
August 4, 1992
Page 2

not, on the property. A final report on the results should be submitted to our office for review and comments. If burials are present, the developer must also approach our Maui/Lana'i Islands Burial Council for review and approval of proposed treatment of these burials (e.g., preservation in place or disinterment and reinterment elsewhere). If other significant historic sites are present, then mitigation measures will need to be proposed also.

Should you have any questions about these comments, please contact Ms. Annie Griffin at 587-0013.

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

AG:aal

Appendix D

***Letter from DLNR State
Historic Preservation Division
Regarding The Maui/Lanai
Islands Burial Council***

JOHN WADSWORTH
GOVERNOR OF HAWAII



Dec 31 1992
STATE OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
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DIVISION

LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Ped-27

December 23, 1992

Mr. Vince G. Bagoyo, Chairman
Planning & Economic Development Committee
Maui County Council
200 S. High Street
Wailuku, Hawai'i 96793

Re: Maui/Lāna`i Islands Burial Council Review of Proposed Hale
Mākua Project (PED-27), Kahului Community Park, Tax Map Key
3-8-7: portion of 97, Kahului, Maui

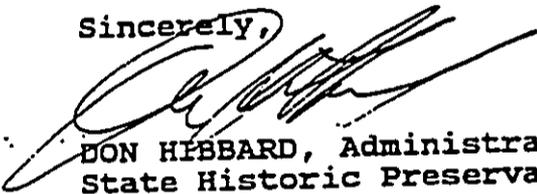
Dear Chairman Bagoyo:

With respect to the above matter, a presentation was made to the Maui/Lāna`i Islands Burial Council ("Council") on December 15, 1992 by Mr. Tony Krieg, President of Hale Mākua. Mr. Krieg presented a summary of the archeological work conducted at the site by Archaeological Consultants Hawai'i which did not identify any unmarked human burial sites.

The Council commented that it did not have adequate time to review the archaeological inventory, as it was presented to them for the first time. Nonetheless, the report had been reviewed and accepted by the State Historic Preservation Division (SHPD). The Council concurred with the SHPD's recommendations to have an archaeologist monitor the grading of the sand dune. Furthermore, following further review of the archeological inventory report, the Council indicated that should it have questions or comments, such comments will be forwarded to you at that time.

If there are any questions, please feel free to contact Edward Halealoha Ayau, Esq. at 587-0010.

Sincerely,


DON HYSBARD, Administrator
State Historic Preservation Division

c: Dana Naone Hall, Chair, Maui/Lāna`i Burial Council

Appendix E

***Letter from Maui County
Cultural Resources Commission***

LINDA CROCKETT LINGLE
Mayor

BRIAN MISKAE
Planning Director



GAYLORD KUBOTA
Chairperson

MOIRA KNOX
Vice Chairperson

Lori U. Sablas
Thomas Cannon
Roland Kaopuiki
J. Kalani English
S. Kiope Raymond
Theresa K. Donham
Rose May K. Enos-Ku

**MAUI COUNTY
CULTURAL RESOURCES COMMISSION**

250 S. High Street
Wailuku, Maui, Hawaii 96793

January 7, 1993

Honorable Linda Crockett Lingle
Mayor, County of Maui
Wailuku, Maui, Hawaii 96793

For Transmittal to:

Mr. Junior Moniz, Chairman
Planning and Economic
Development Committee
County of Maui
Wailuku, Maui, Hawaii 96793

**SUBJECT: COMMUNITY PLAN AMENDMENT AND CHANGE IN ZONING FOR
HALE MAKUA (PED-27).**

Please be advised that the Maui County Cultural Resources Commission at its regular meeting of January 7, 1993 reviewed the archaeological report prepared by Archaeological Consultants of Hawaii, Inc. for the Hale Makua site.

The Commission voted unanimously to approve said report in that no evidence of burials or other historic sites were found on the subject site. In addition, they acknowledged that there is still a possibility for an isolated burial to be encountered during massive grading of the dune and support having archaeological monitoring to be conducted during construction. Further, the Commission supported the continued processing of the Community Plan and Change in Zoning proposals.

If further clarification is needed, please notify the Planning Department and we will respond as soon as possible.

Very truly yours,


GAYLORD KUBOTA, Chairman
Cultural Resources Commission

cc: CRC Members
Tony Kreig
Mike Munekiyo
Elizabeth Anderson
Ann Cua

1995-07-23-MA-FEA-Hana Hwy. Hanawana Stream culvert
Replacement

**FINAL ENVIRONMENTAL ASSESSMENT
NEGATIVE DECLARATION FOR
HANA HIGHWAY
HANAWANA STREAM CULVERT REPLACEMENT
PROJECT NO. 360A-02-95M
MAKAWAO, MAUI
JUNE 30, 1995**

Proposing Agency: State of Hawaii, Department of
Transportation, Highways Division

Agencies Consulted:

Federal:

U.S. Army Corps of Engineers
U.S. Department of the Interior, Fish & Wildlife Services

State:

Department of Business, Economic Development and Tourism
Department of Health, Environmental Management Division
Department of Land and Natural Resources
Office of State Planning

County of Maui:

Planning Department
Department of Public Works
Department of Water Supply
Economic Development Agency

Others:

Nature Conservancy of Hawaii
Sierra Club of Hawaii, Maui Group

Project Characteristics:

General:

The State of Hawaii, Department of Transportation, Highways Division is proposing to replace culverts at Hanawana Stream. The existing culverts are located on Hana Highway, approximately two (2) miles southeast of Waipio Bay at mile post 5.44, see figures 1 and 2. There are three (3) culverts at this location, each one rusted through at the inverts. Also, the stream water overtops the highway during periods of heavy rainfall, temporarily obstructing vehicular traffic.

Hana Highway, in the vicinity of the proposed project area, is a 2-lane highway, 1-lane in each direction. The existing traveled way is 18' wide, and there are 4' wide unpaved

shoulders on both sides of the highway.

- Technical:** The proposed project consists primarily of replacing the three (3) existing 36" diameter cast iron pipes crossing Hana Highway, each pipe approximately 35' long with three (3) 48" diameter, 46' long reinforced concrete pipes; including headwalls, wingwalls, and appurtenant work such as minor channel excavation, pavement reconstruction and guardrail installation. Work will also include installing wire fence and relocating a one(1) inch polyvinyl chloride waterline. Figures 3 thru 8 shows the proposed work.
- Economic:** The estimated construction costs for the proposed project will be \$ 216,000.00 for the State of Hawaii.
- Social:** The project is located within the State Land Use Agricultural District. The existing culverts are located at the Hanawana Stream crossing of Hana Highway. Hana Highway is the only developed roadway serving the towns from Hana to Paia. This highway is used primarily by residents commuting to jobs in Makawao and Wailuku, and visitors travelling to and from Hana. The proposed project will not allow the closure of more than one lane during the construction period. The proposed culvert replacement will increase the capacity of water flow, thereby reducing the possibility of the stream overtopping the highway during heavy rainfall. And as a result, the project will provide a safer and more reliable highway for the travelling public.
- Environmental:** The proposed project is planned to be constructed within the existing State Highway right-of-way. No unusual flora or fauna inhabit the project site. Also, there are no known historical, cultural or archaeological sites within the project limits. Hana Highway will remain a 2-lane facility upon completion of project; therefore, air quality and noise levels will not be permanently affected. All construction work will be designed to resemble existing conditions so as not to adversely affect visual impacts. Best management practices will be applied so no significant long term adverse affects on water quality in the stream or the ocean is anticipated. Appropriate mitigation measures will be utilized to minimize adverse

environmental impacts during construction of the project.

Summary of the Affected Environment:

The proposed culvert replacements will produce a safer and more reliable roadway while causing no significant long term adverse impacts. There are no endangered flora, fauna, critical habitats, historical/archaeological or cultural sites at the location of the proposed project.

Summary of Major Impacts:

Short Term:

During construction, the following minor adverse impacts are anticipated:

1. Some dust and noise
2. Traffic slow down
3. Minor water quality problems from silt and construction debris

Long Term:

No significant long term adverse impact is anticipated in the following conditions due to construction of the proposed project.

1. Air Quality
2. Noise
3. Traffic
4. Historical/Archaeological
5. Flora
6. Fauna
7. Visual
8. Water Quality

Alternatives Considered:

The "No Action" alternative was considered but determined to be unacceptable because the benefits of providing the motoring public with a safer and more reliable highway far outweigh the minor adverse impacts anticipated while constructing this project.

Proposed Mitigation Measures During Construction:

1. The generation of dust and noise are anticipated by the construction activities. Dust levels will be controlled by sprinkling with non-potable water. General construction noises will be mitigated by limiting the hours of construction activities to 7:00 a.m. to 4:00 p.m., five days a week. In addition, noise attenuating devices on construction equipment will be functional and properly maintained.
2. Traffic will be disrupted due to the temporary closure of one traffic lane. Disruptions will be reduced by implementing construction traffic control plans, and by the use of public informational signs; news releases; and other traffic control devices, including cones, signs, and flaggers to alert motorists of construction activities.
3. Water quality in the stream may be affected by silt and debris during construction. Measures to minimize erosion and siltation will include; scheduling site work during periods of minimum rainfall, replanting or covering lands denuded of vegetation as quickly as possible, and preventing construction materials and petroleum products from falling, blowing or leaching into the stream. Other mitigative measures to contain silt and construction debris may involve the construction of temporary berms, dikes, dams, sediment basins. In addition, excavation shall be confined to the minimum area necessary to ease construction equipment and work force engaged in excavation work. Also, fill material shall be of suitable quality, free of deleterious substance, and able to withstand expected high flows.

Permits Required Prior To Start Of Construction:

1. Stream Channel Alteration Permit (SCAP) DLNR Commission on Water Resource Management
2. Department of the Army Permit (DA)
U.S. Army Corps of Engineers
3. Section 401 Water Quality Certification (WQC)
DOH Environmental Management Division

Determination:

The proposed project will not cause significant adverse environmental impact and a negative declaration is applicable.

Findings and Reasons Supporting Determination:

The proposed project will not:

1. involve an irrevocable commitment to loss or destruction of any natural or cultural resource;
2. curtail the range of beneficial uses of the environment;
3. conflict with the State's long-term environmental policies;
4. detrimentally affect the economic or social welfare of the community or state;
5. detrimentally affect the public health;
6. involve substantial secondary impacts, such as population changes or effects on public facilities;
7. involve a substantial degradation of environmental quality;
8. affect any rare, threatened, or endangered species of flora and fauna or habitat;
9. detrimentally affect environmentally sensitive areas such as flood plain, tsunami zone, erosion-prone flood area, geologically hazardous land, estuary, fresh or coastal water; and
10. detrimentally affect air or water quality or ambient noise levels.

For the reasons above, the proposed project will not have any significant effect in the context of Chapter 343, Hawaii Revised Statutes and Section 11-200-12 of the State Administrative Rules.

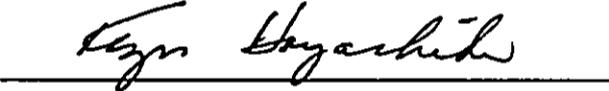
RECEIVED AND ACCEPTANCE RECOMMENDED:



HUGH Y. ONO
Administrator
Highways Division

7-10-95
Date

CONCURRENCE:



KAZU HAYASHIDA
Director of Transportation

7/12/95
Date

7/5 dw HWY-DD (A.
(Allan N)

HWY-DD
2.6259

June 26, 1995

MEMORANDUM:

TO: RAE M. LOUI, DEPUTY DIRECTOR
COMMISSION ON WATER RESOURCE MANAGEMENT
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: HUGH Y. ONO, ADMINISTRATOR
HIGHWAYS DIVISION

SUBJECT: COMMISSION ON WATER RESOURCE MANAGEMENT LETTER
DATED MARCH 2, 1995 FOR HANA HIGHWAY, HANAWANA STREAM
CULVERT REPLACEMENT, PROJECT NO. 360A-02-95M
MAKAWAO, MAUI

Thank you for your review of the Draft Environmental Assessment
and the stream channel alteration permit (SCAP) information.

We submitted an application for a SCAP on March 23, 1995.

KI:ra

bc: HWY-DD (A.N.) ✓

EXHIBIT A

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



RECEIVED
MAR 3 10 06 AM '95

STATE OF HAWAII DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

MICHAEL D. WILSON
CHAIRPERSON
ROBERT S. NAKATA
ROBERT G. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIKE
RAE M. LOUI, P.E.
DEPUTY

MAR - 2 1995

RECEIVED
MAR 3 5 16 PM '95
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

Mr. Hugh Y. Ono, Administrator
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Ono:

Hana Highway, Hanawana Stream Culvert Replacement
Project No. 360A-02-95M

In response to the Draft Environmental Assessment (DEA) for the subject project, the DEA acknowledges the need for a stream channel alteration permit pursuant to Section 13-169-50, Hawaii Administrative Rules.

For more information regarding permit processing, please do not hesitate to call David Higa at 587-0249.

Sincerely,

RAE M. LOUI
Deputy Director

DH:ss

c: OCEA

EXHIBIT A

BENJAMIN J. CAYETANO
GOVERNOR



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

KAZU HAYASHIDA
DIRECTOR
DEPUTY DIRECTORS
~~GLENN M. OKIMOTO~~
GLENN M. OKIMOTO

IN REPLY REFER TO:
HWY-DD
2.6301

June 29, 1995

Mr. Charles Jencks, Director
Department of Public Works
and Waste Management
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Dear Mr. Jencks:

Subject: Hana Highway, Hanawana Stream Culvert Replacement
Project No. 360A-02-95M, Makawao, Maui

Thank you for your review and comments on the Draft
Environmental Assessment for subject project. Provisions for
traffic control and for disposal of clearing and grubbing will
be included in the project contract documents. We believe no
further action is necessary.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Hugh Y. Ono".

for HUGH Y. ONO
Administrator
Highways Division

EXHIBIT B

LINDA CROCKETT LINGLE
Mayor

GEORGE N. KAYA
Director

CHARLES JENCKS
Deputy Director

AARON SHINMOTO, P.E.
Chief Staff Engineer

RECEIVED
MAR 17 3 42 PM '95
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT

LAND USE AND CODES ADMINISTRATION
250 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

March 9, 1995

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration

EASSIE MILLER, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

DAVID WISSMAR, P.E.
Solid Waste Division

BRIAN HASHIRO, P.E.
Highways Division

RECEIVED
MAR 23 9 15 AM '95
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION

Mr. Hugh Y. Ono, Administrator
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Assessment
HANA HIGHWAY, HANAWANA STREAM CULVERT REPLACEMENT
Project No. 360A-02-95M

Dear Mr. Ono:

We reviewed the subject assessment and have the following comments:

1. Comments from the Engineering Division:

- a. The construction plans should denote "Traffic Control Plans" to show construction phasing and possible road closures, if any.

The applicant is requested to contact the Engineering Division at 243-7745 for additional information.

2. Comments from the Wastewater Reclamation Division:

This division has reviewed this submittal and has no comments at this time.

3. Comments from the Solid Waste Division:

- a. Contact the Central Maui Sanitary Landfill Operations Supervisor at 877-7596 or 877-5319 for instructions on the disposal of clearing and grubbing.

EXHIBIT B

Printed on recycled paper



Mr. Hugh Y. Ono
Page 2 of 2
March 9, 1995

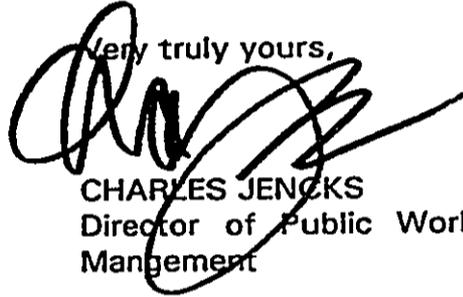
The applicant is requested to contact the Solid Waste Division at 243-7875 for additional information.

4. Comments from the Land Use and Codes Administration:

This division has reviewed this submittal and has no comments at this time.

If you have any question regarding this letter, please call me at 243-7845.

Very truly yours,



CHARLES JENCKS
Director of Public Works & Waste
Mangement

ey
xc: Engineering Division
Solid Waste Division
Wastewater Reclamation Division

g:\ucal\all\czm\hanawana.dea

EXHIBIT B

STATE OF HAWAII

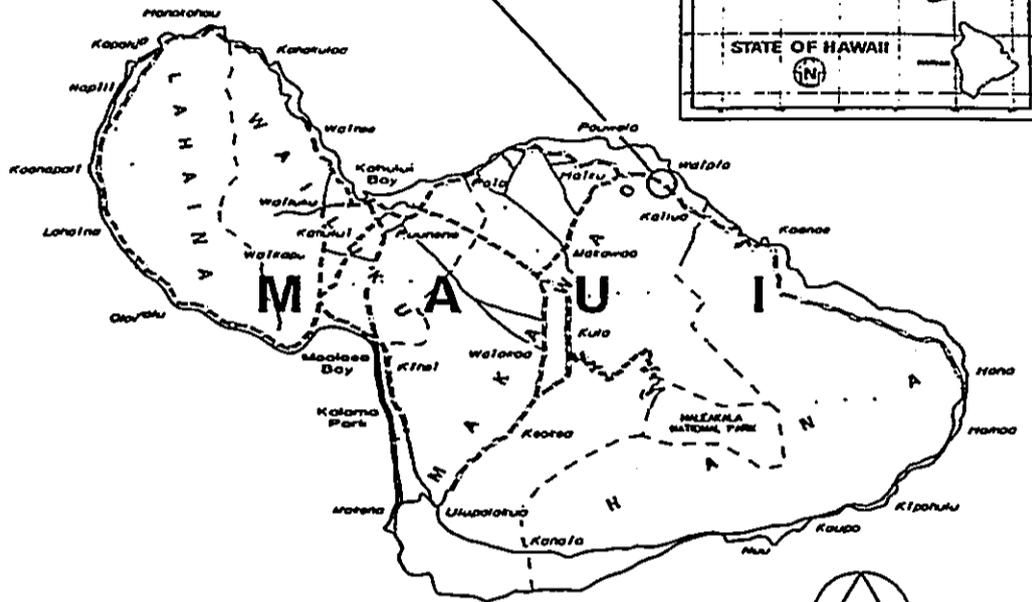
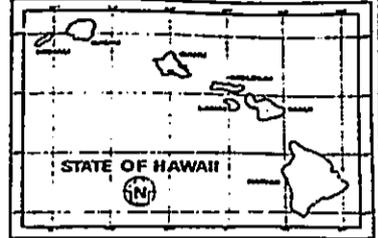
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HONOLULU, HAWAII

PLANS FOR
MAUI HIGHWAY
TEAM CULVERT REPLACEMENT
PROJECT NO. 360A-02-95M

DISTRICT OF MAKAWAO
ISLAND OF MAUI

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-02-95M	1995	1	9

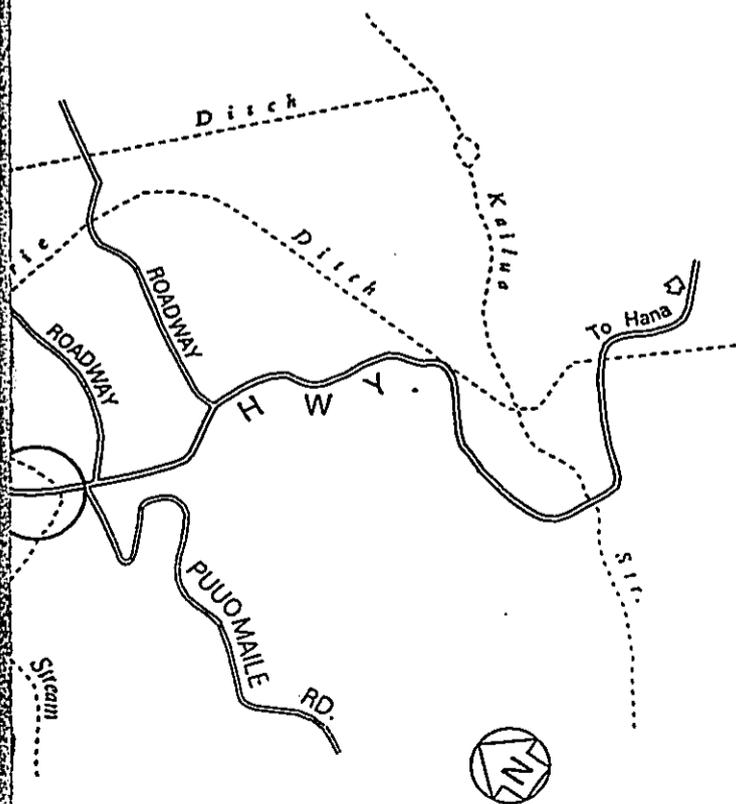
LOCATION OF PROJECT



SCALE IN MILES

— FEDERAL AID PROJECTS PREVIOUSLY CONSTRUCTED OR UNDER CONSTRUCTION

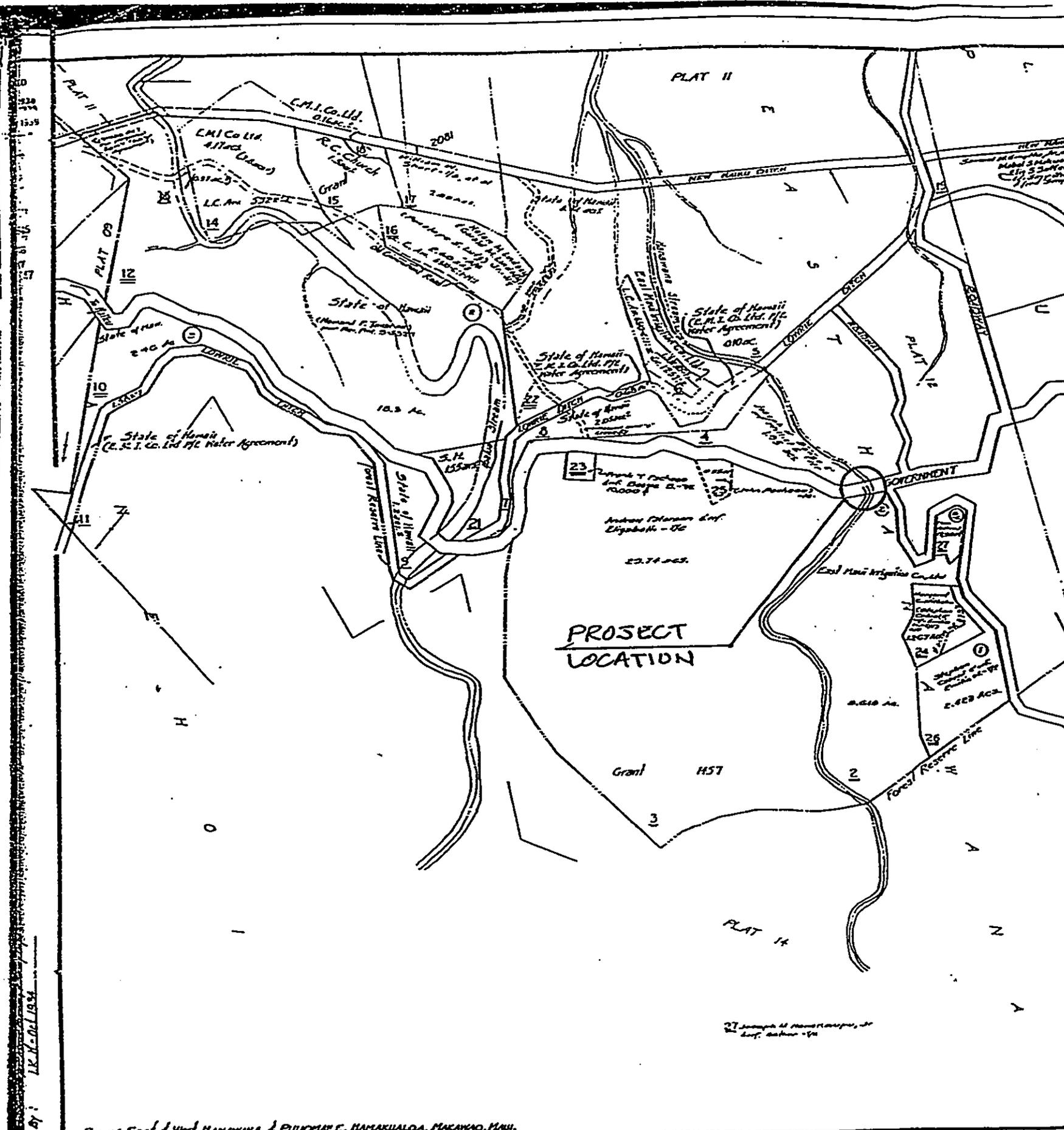
MILE POST 5.44 TO MILE POST



PLAN

DEPARTMENT OF TRANSPORTATION STATE OF HAWAII	
APPROVED:	
DIR. OF TRANSPORTATION	DATE

FIGURE 1



By: J.P.H. - Oct 1934

Part of East of West HANALEI, PILIOPALE, HANAKUALOA, MAKAWAO, HAWAII.

27 Joseph M. Hanalei, Jr.
Surf. Author - 34

@ Sta. 132+80± Rt. & Lt.,
 @ Sta. 143+20± Rt. & Lt.
 Install four (4) Construction Warning Signs with posts.
 Install sign CW20-1d, "Road Construction Ahead," at @ Sta. 132+80± Rt. and @ Sta. 143+20± Lt.
 Install sign CG20-2, "End Construction," at @ Sta. 132+80± Lt. and @ Sta. 143+20± Rt.

@ Sta. 137+56± Lt. o/s 15± To
 @ Sta. 137+70± Lt. o/s 25±
 Remove 32± of existi. barbed wire fence.
 Install 23± of New Wire Fence, see Details on this sheet.

@ Sta. 137+84± To @ Sta. 138+18±
 Reconstruct pavement with 2" A.C., Mix No. V and 4" Base Course, See Pavement Reconstruction Detail on this sheet.

@ Sta. 137+85± Rt. To @ Sta. 137+96± Rt.
 Install 12.5± Lin. Ft. of New Metal Guardrail, Type 3-Single w/Steel Post, Modified Type "G" Flare w/Rounded End.

@ Sta. 137+84± Rt. o/s 25± To
 @ Sta. 137+89± Rt. o/s 25±
 Install 5± of New Wire Fence, See Detail on this sheet.

@ Sta. 137+96± Rt. To @ Sta. 138+21± Rt.
 Install 25 Lin. Ft. of New Metal Guardrail, Base Plate and Steel Post on Structure. See Plan Sht. Nos. 6 & 9 for Details.

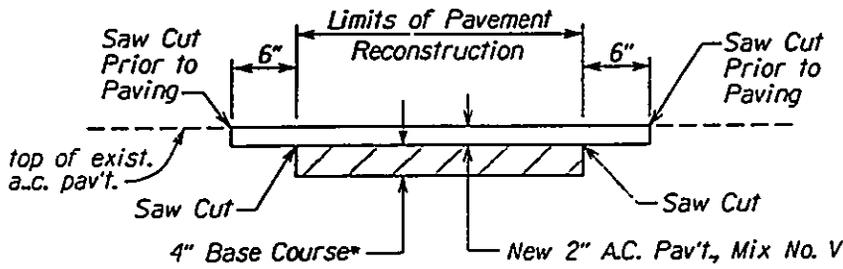
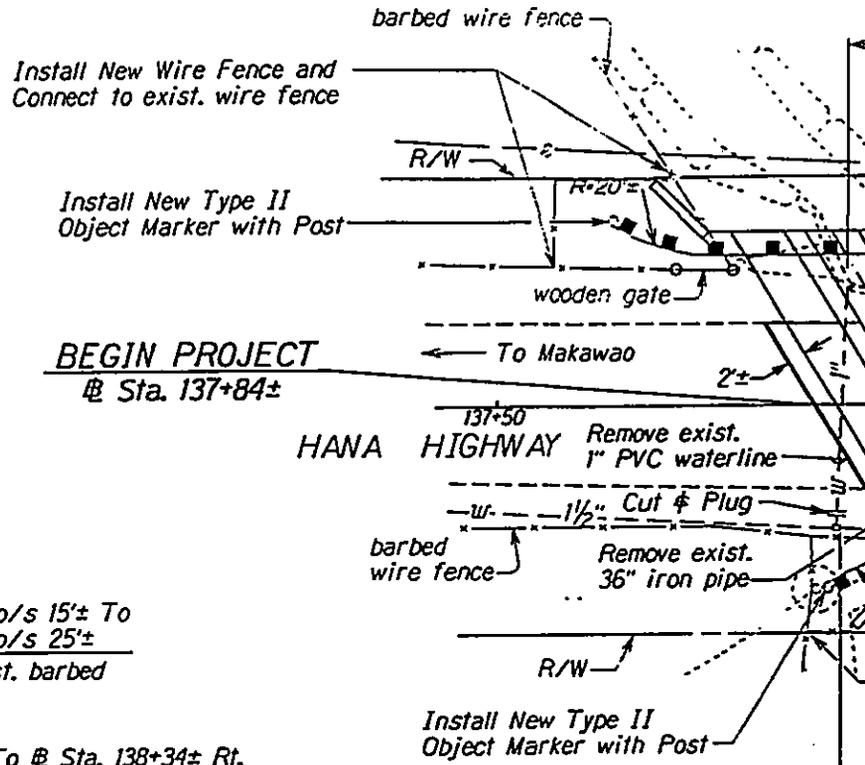
@ Sta. 137+62± Lt. To @ Sta. 137+74± Lt.
 Install 12.5± Lin. Ft. of New Metal Guardrail, Type 3-Single w/Steel Post, Modified Type "G" w/Rounded End.

@ Sta. 137+85± Rt. o/s 15± To
 @ Sta. 138+46± Rt. o/s 25±
 Remove 68± of existi. barbed wire fence.

@ Sta. 138+21± Rt. To @ Sta. 138+34± Rt.
 Install 12.5± Lin. Ft. of New Metal Guardrail, Type 3-Single w/Steel Post, Modified Type "G" Flare w/Rounded End.

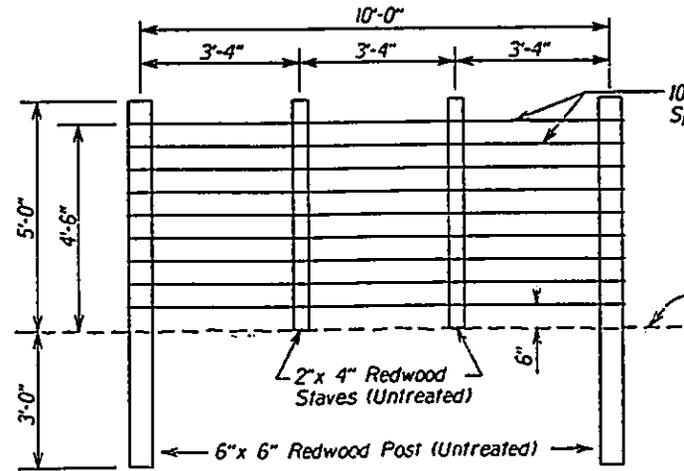
@ Sta. 138+29± Rt. o/s 25± To
 @ Sta. 138+46± Rt. o/s 25±
 Install 17± of New Wire Fence, See Detail on this sheet.

@ Sta. 137+74± Lt. To @ Sta. 137+99± Lt.
 Install 25 Lin. Ft. of New Metal Guardrail, Base Plate and Steel Post on Structure. See Plan Sht. Nos. 8 & 9 for Details.



PAVEMENT RECONSTRUCTION DETAIL
 Not To Scale

*Plant Mix or Recycled Plant Mix A.C. Base Course or Plant Mix Glassphalt Concrete Base Course.



DETAIL FOR WIRE FENCE
 Scale: 1/2" = 1'-0"

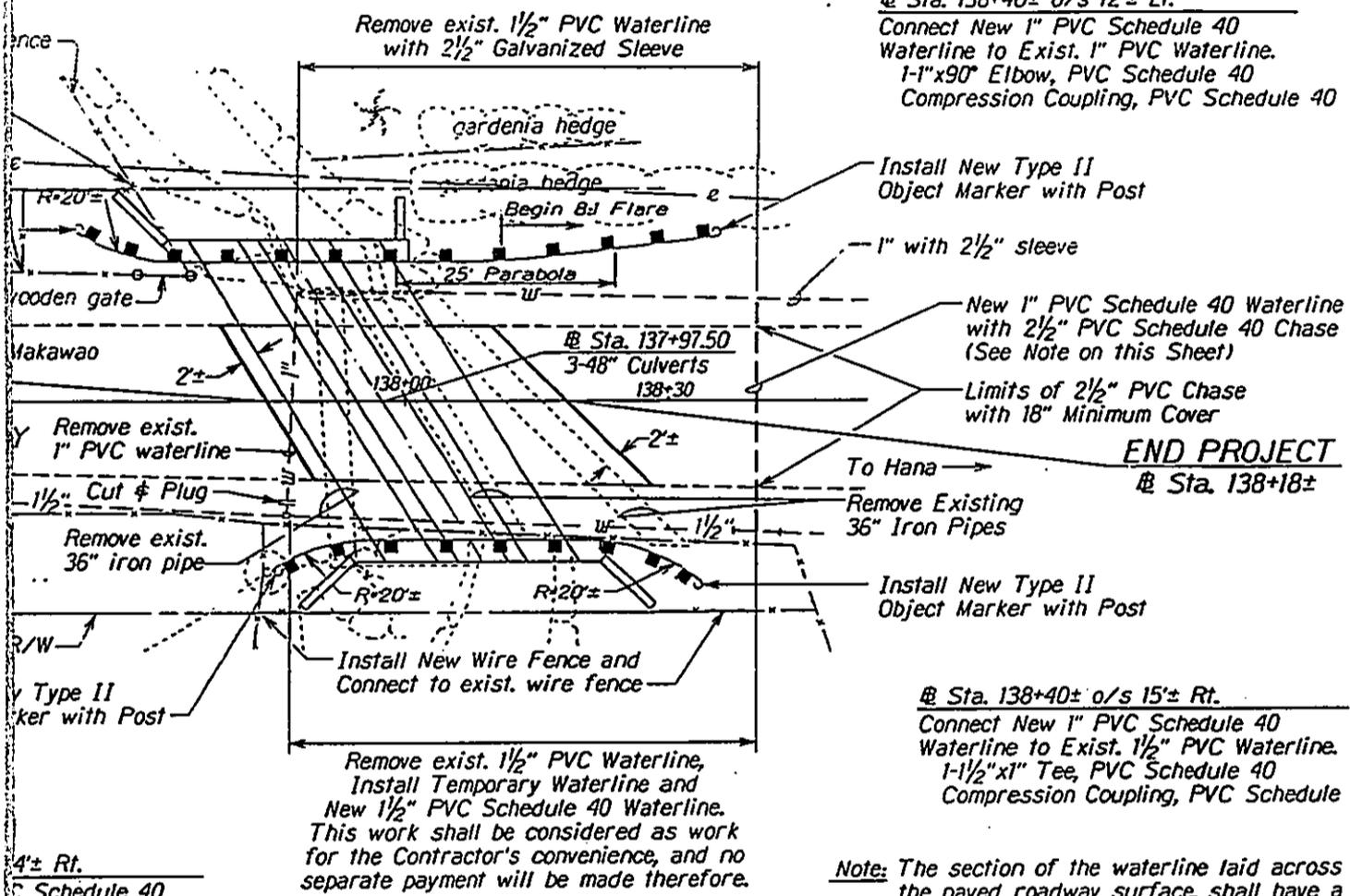
DATE	1/27/25
DESIGNED BY	J.J.
CHECKED BY	J.J.
IN CHARGE	J.J.
DATE	1/27/25
DESIGNED BY	J.J.
CHECKED BY	J.J.
IN CHARGE	J.J.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-02-95M	1995	4	9

Lt. To @ Sta. 137+99± Lt.
 Ft. of New Metal Guardrail,
 d Steel Post on Structure.
 Nos. 8 & 9 for Details.

@ Sta. 137+99± Lt. To @ Sta. 138+36± Lt.
 Install 37.5± Lin. Ft. of New Metal Guardrail,
 Type 3-Single w/Steel Post, Modified Type
 "G" Flare w/Rounded End.

@ Sta. 138+40± o/s 12± Lt.
 Connect New 1" PVC Schedule 40
 Waterline to Exist. 1" PVC Waterline.
 1-1"x90° Elbow, PVC Schedule 40
 Compression Coupling, PVC Schedule 40



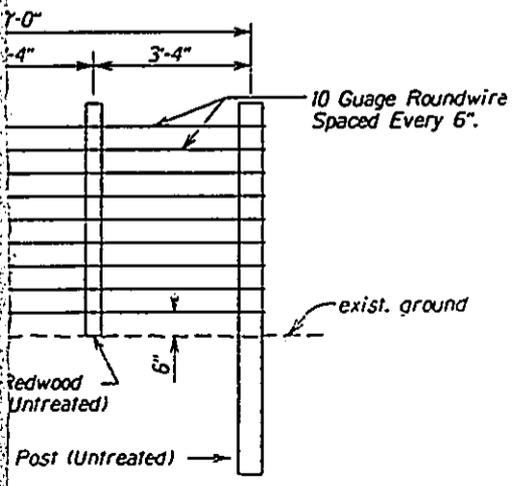
@ Sta. 138+40± o/s 15± Rt.
 Connect New 1" PVC Schedule 40
 Waterline to Exist. 1 1/2" PVC Waterline.
 1-1/2"x1" Tee, PVC Schedule 40
 Compression Coupling, PVC Schedule 40

Note: The section of the waterline laid across
 the paved roadway surface, shall have a
 minimum cover of 18" from top of chase
 to the finished grade.

4± Rt.
 Schedule 40
 1/2" PVC Waterline

Remove exist. 1 1/2" PVC Waterline,
 Install Temporary Waterline and
 New 1 1/2" PVC Schedule 40 Waterline.
 This work shall be considered as work
 for the Contractor's convenience, and no
 separate payment will be made therefore.

PLAN
 1" = 10'



WIRE FENCE
 1" = 0'

DATE	REVISION
6/1/95	Added Relocation of Water System

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ROADWAY PLAN

HANA HIGHWAY

Hanawana Stream Culvert Replacement

Proj. No. 360A-02-95M

Scale: As Noted Date: Jan., 1995

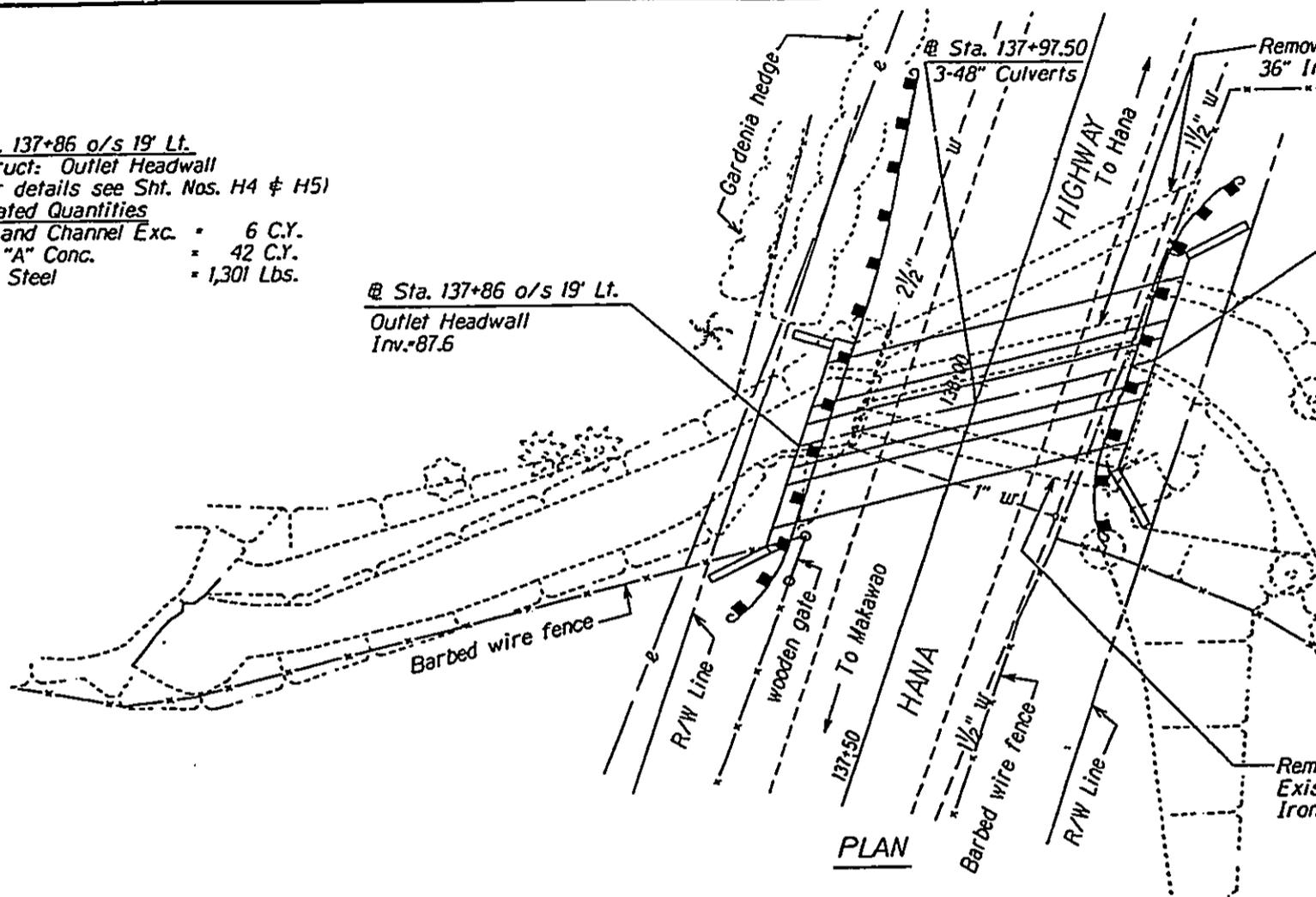
SHEET No. 1 OF 1 SHEETS

FIGURE 3

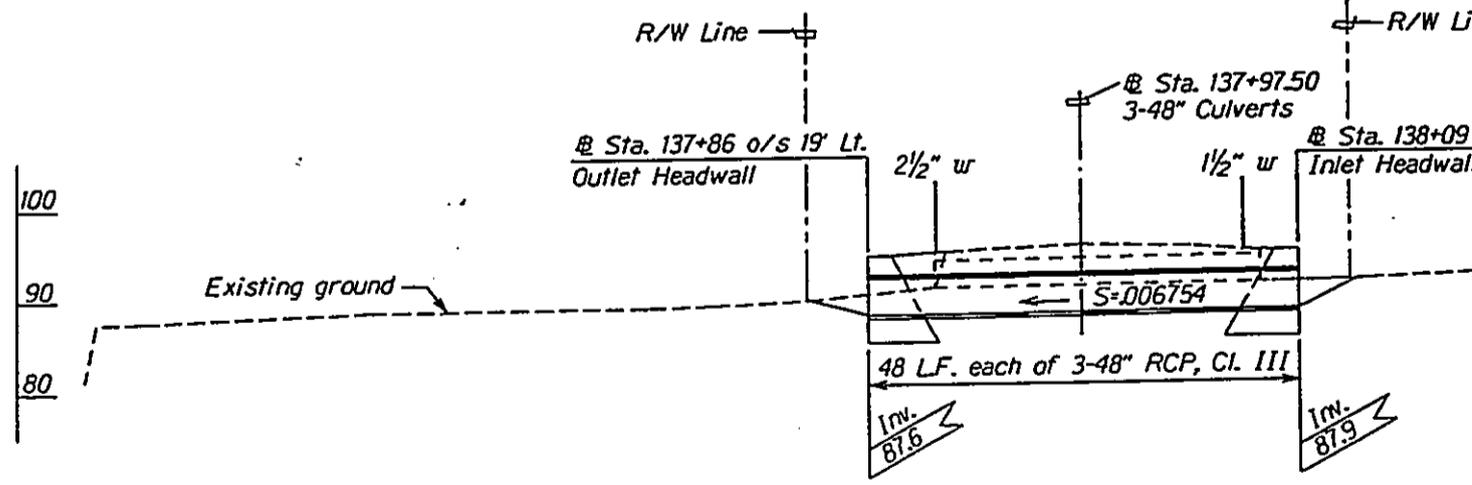
ADD. 4

@ Sta. 137+86 o/s 19' Lt.
 Construct: Outlet Headwall
 (For details see Sht. Nos. H4 & H5)
 Estimated Quantities
 Ditch and Channel Exc. = 6 C.Y.
 Class "A" Conc. = 42 C.Y.
 Reinf. Steel = 1,301 Lbs.

@ Sta. 137+86 o/s 19' Lt.
 Outlet Headwall
 Inv.=87.6



PLAN

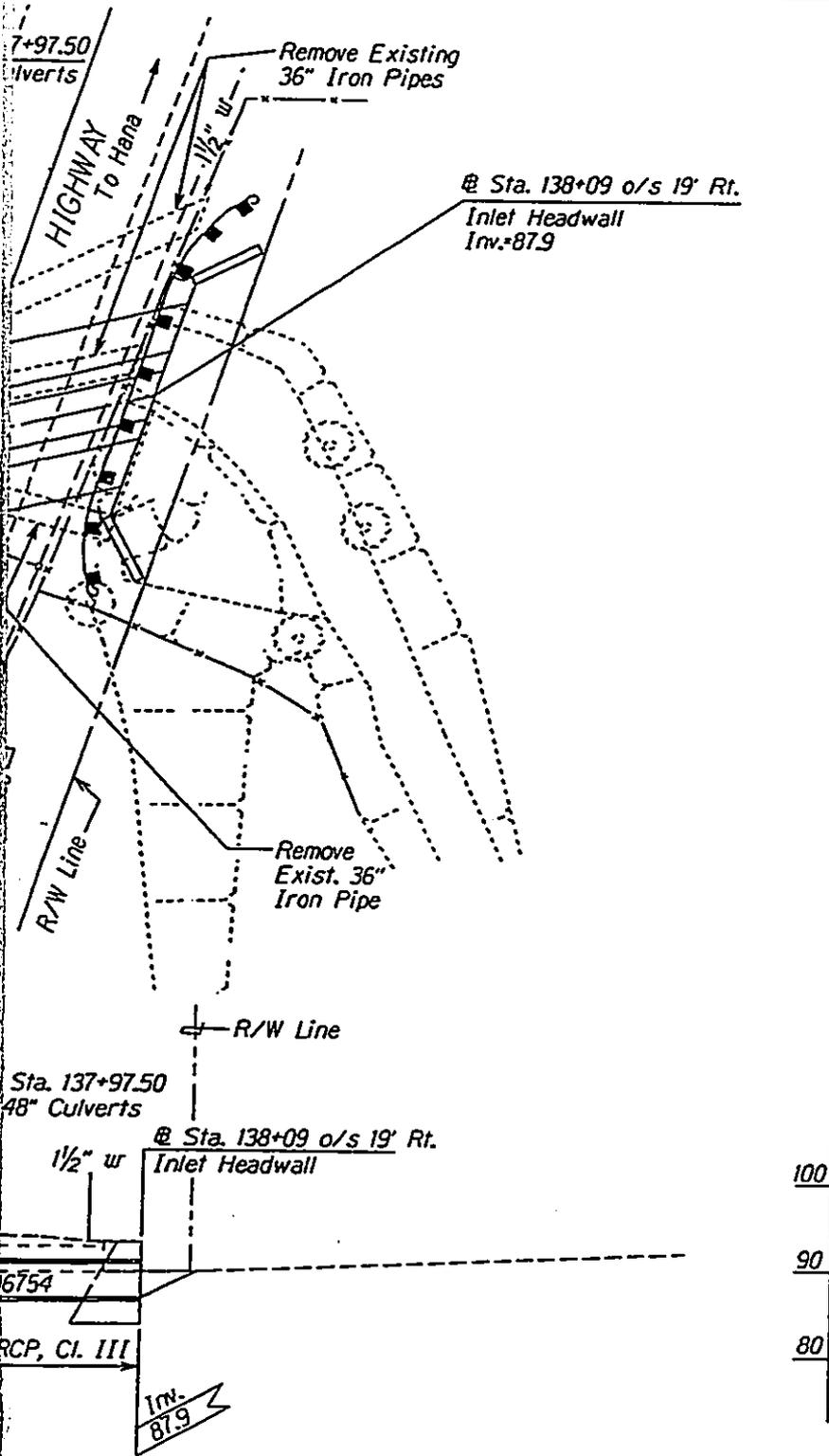


PROFILE ALONG C 3-48" CULVERTS

DETAILS OF 3-48" CULVERTS AT @ STA. 137-

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
APPROVED BY	
PROJECT NO.	
DATE	
SCALE	
BY	
DATE	
BY	
DATE	
BY	
DATE	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-02-95M	1995	5	9

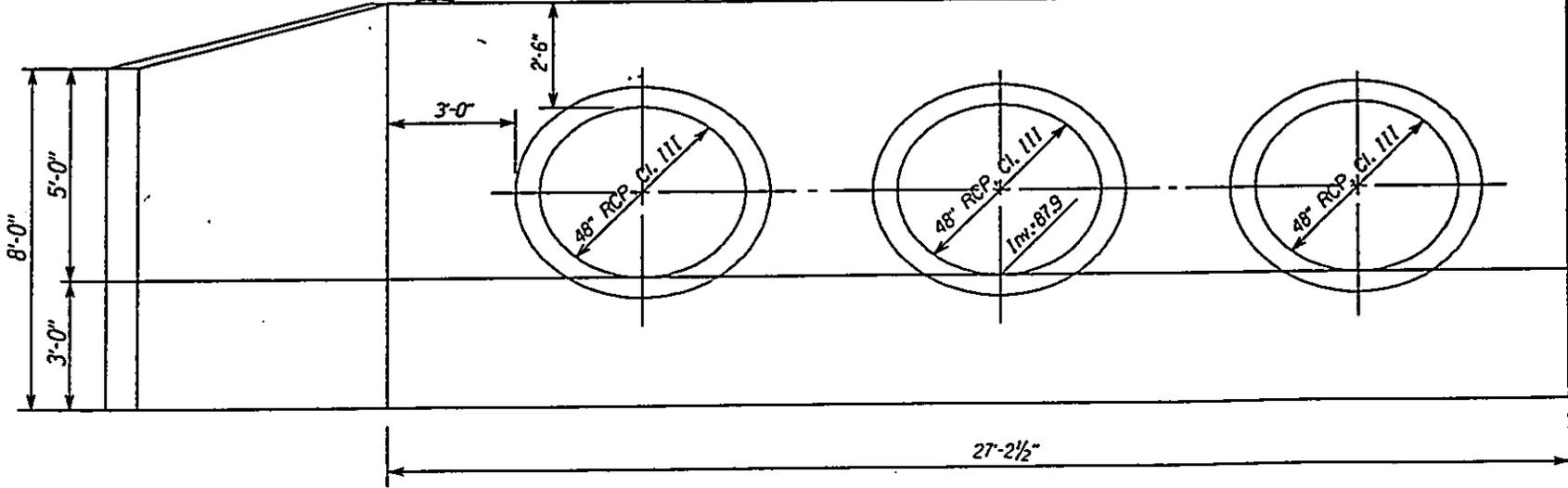
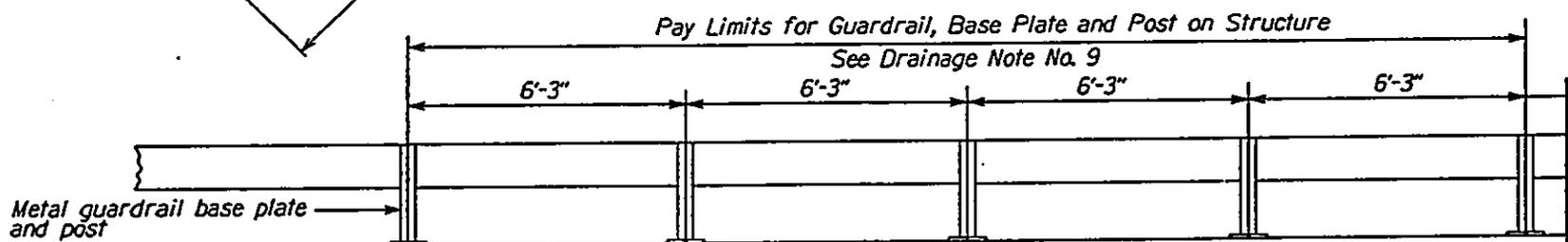
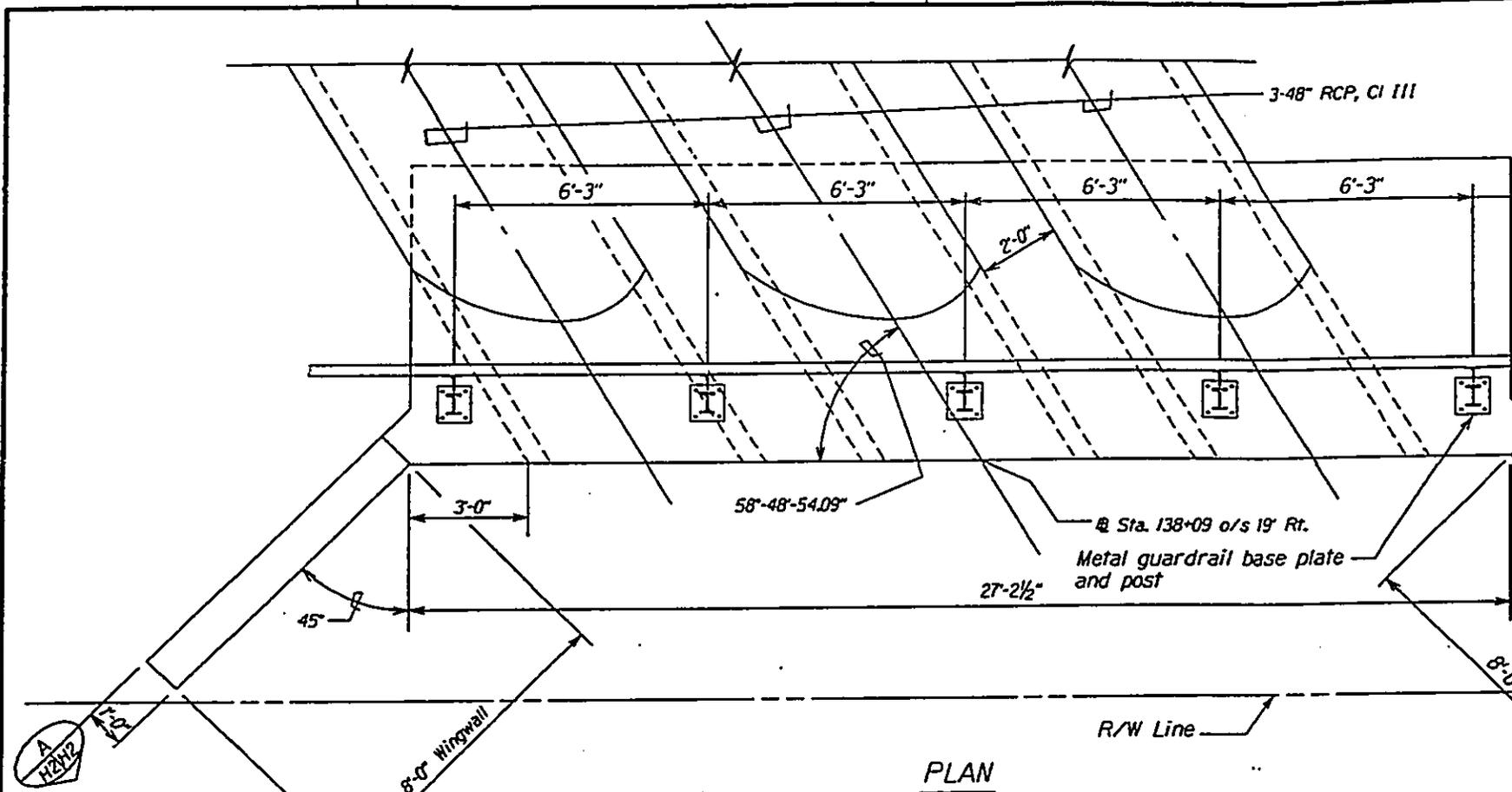


@ Sta. 138+09 o/s 19' Rt.
 Construct: Inlet Headwall
 (For details see Sht. Nos. H2, H3 & H5)
Estimated Quantities
 Structure Exc. = 272 C.Y.
 Structure Backfill = 123 C.Y.
 Ditch and Channel Exc. = 10 C.Y.
 Plant Mix Asphalt
 Concrete Base Course = 12 Tons
 Asphalt Concrete Pavement
 Mix No. V = 6 Tons
 Class "A" Conc. = 43 C.Y.
 Reinf. Steel = 1,443 Lbs.
 48" RCP, Cl. III = 144 LF.

48" CULVERTS
 AT @ STA. 137+97.50

FIGURE 4

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
DRAINAGE PLAN
 HANA HIGHWAY
 Hanawana Stream Culvert Replacement
 Proj. No. 360A-02-95M
 Scale: 1"=10' Date: Aug, 1994
 SHEET No. H1 OF 5 SHEETS



DETAIL OF INLET HEADWALL AT ⊕ STA. 138+09 O/S 19' RT.

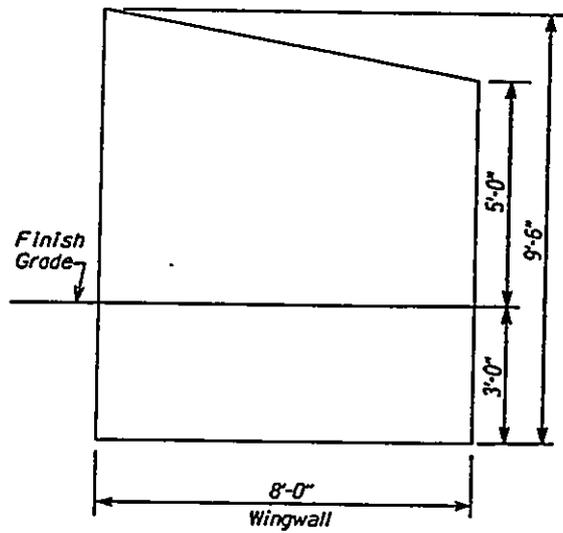
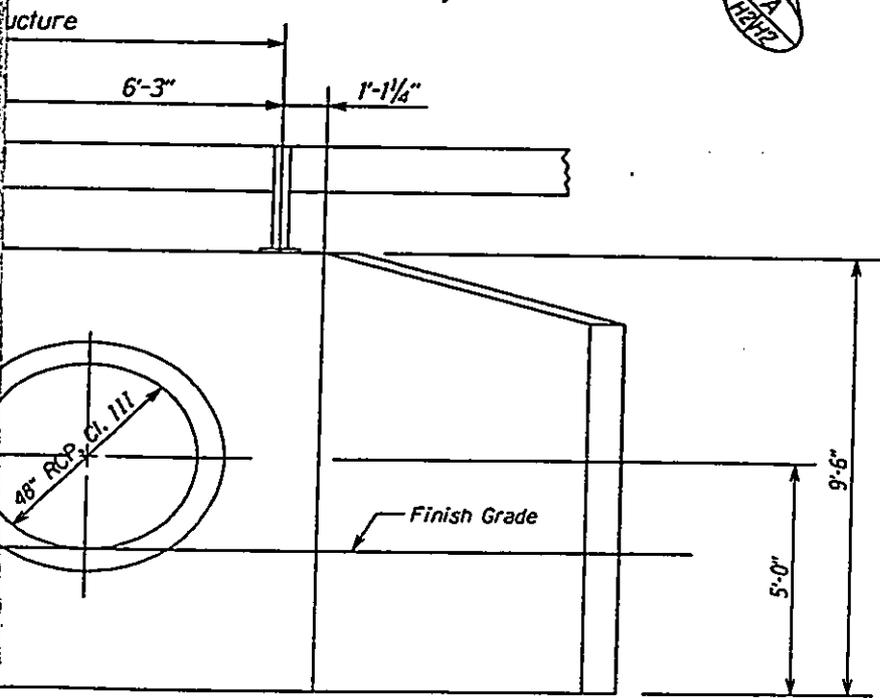
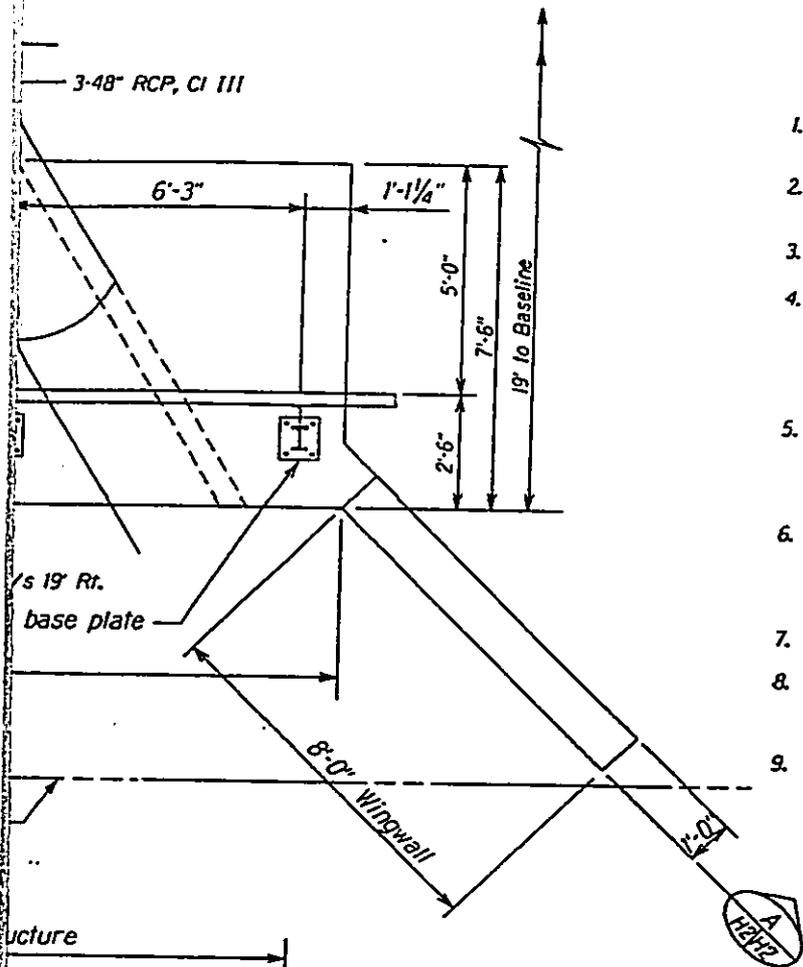
DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
IN CHARGE	
PROJECT NO.	
DATE	
BY	
FOR	
BY	
FOR	
BY	
FOR	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-02-95M	1995	6	9

DRAINAGE NOTES

- All work shall conform to The Hawaii Standard Specifications for Road and Bridge Construction.
- All concrete shall have a minimum 28 day compressive strength of 3,000 psi.
- All deformed reinforcing steel shall have a minimum yield strength of 40 ksi.
- Foundation design is based on the following soil values:

Allowable Soil Bearing Pressure	2,500 psf
Active Pressure	35 pcf
Passive Pressure	300 pcf
Coefficient of Friction	0.4
- Existing drainage systems will be functional at all times during construction. The Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to maintain flow. The cost for this work shall be incidental to the various contract items.
- The Contractor shall verify the locations of all existing culverts and utilities in the field. Any existing culverts and utilities damaged during construction shall be repaired or replaced by the Contractor at his own expense.
- Chamfer all exposed concrete edges 1 inch.
- Cost of removal of existing 36" pipes and appertenant structures shall not be paid for separately but shall be considered incidental to the structure excavation.
- The metal guardrail, base plate and post located on each headwall shall not be paid for separately but shall be considered incidental to Class A concrete.



SECTION A
H2H2

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

HANA HIGHWAY
Hanawana Stream Culvert Replacement
Proj. No. 360A-02-95M

Scale: 1/2" = 1'-0"

Date: Aug, 1994

SHEET No. H2 OF 5 SHEETS

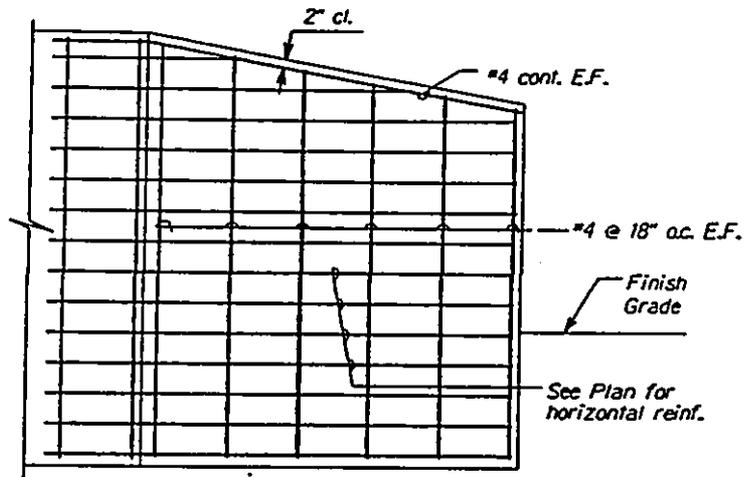
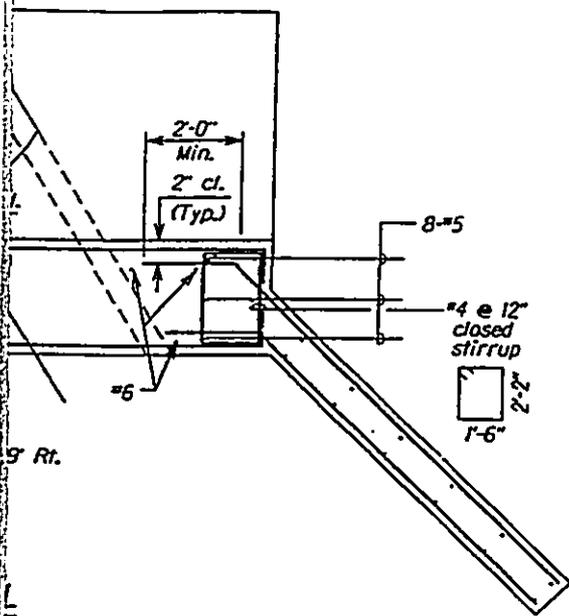
6

8+09 O/S 19' RT.

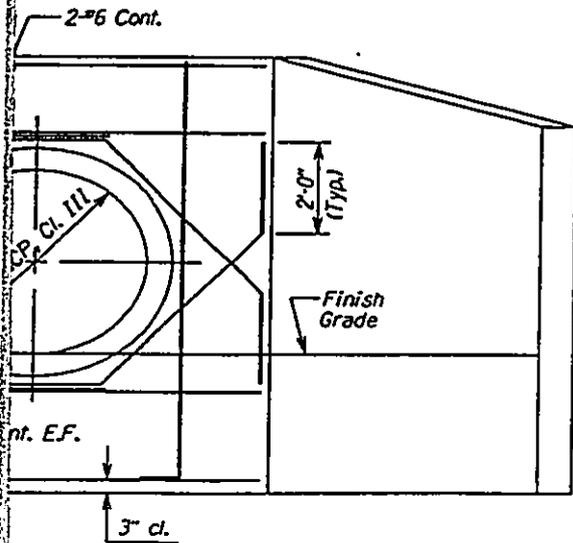
FIGURE 5

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-02-95M	1995	7	9

RCP, CI III



WALL REINFORCING FOR INLET WINGWALLS



and wing wall reinf.
shown for clarity

8+09 0/S 19' RT.

FIGURE 6

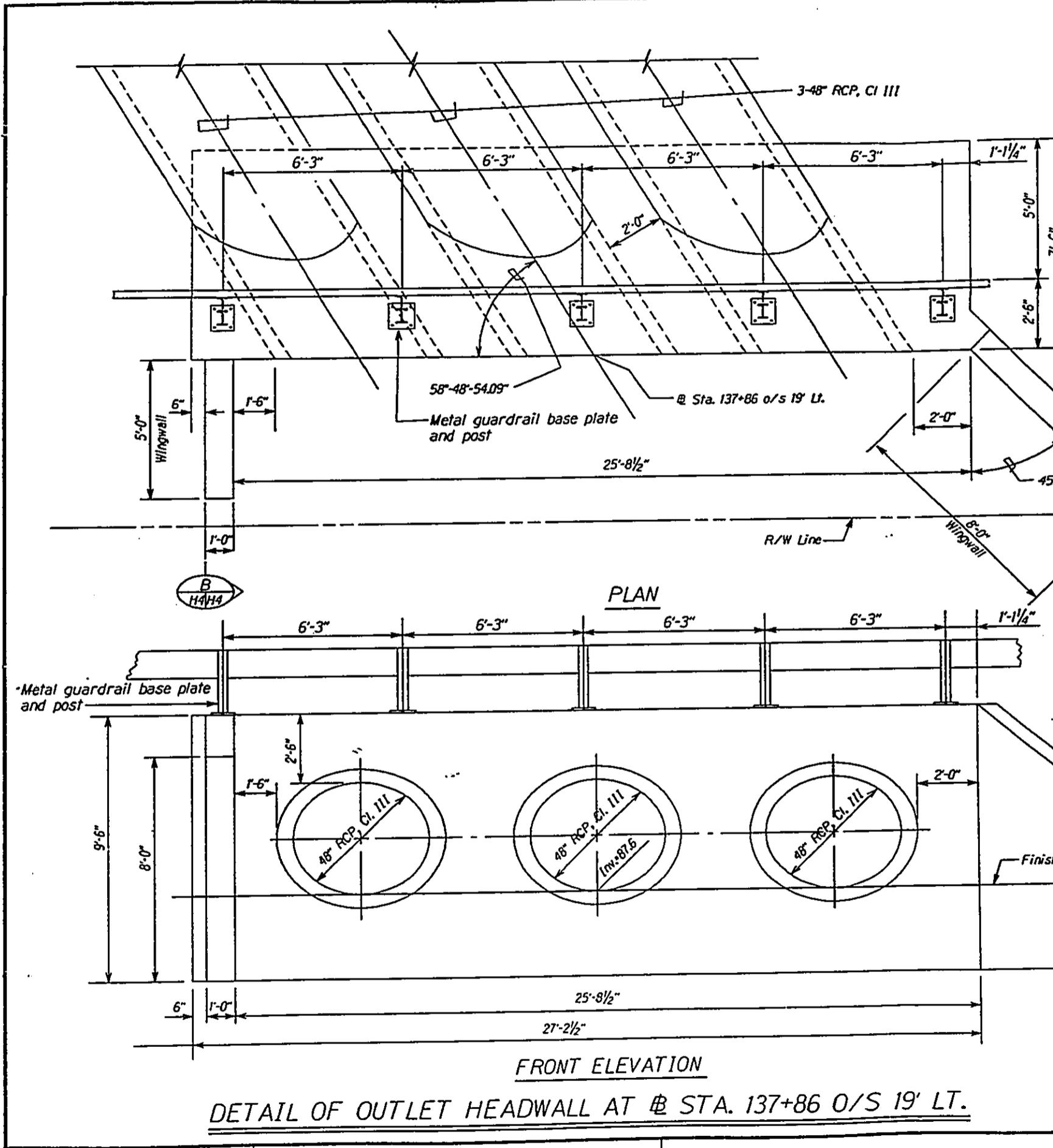
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

HANA HIGHWAY
Hanawana Stream Culvert Replacement
Proj. No. 360A-02-95M

Scale: 1/2" = 1'-0" Date: Aug, 1994

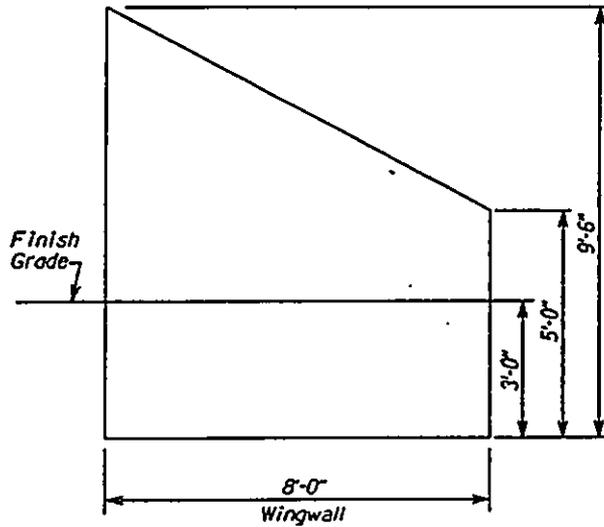
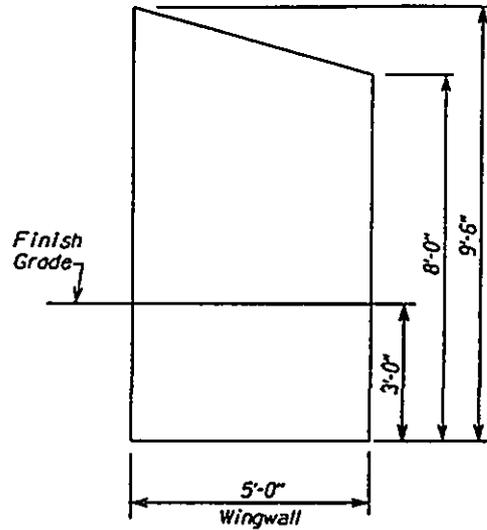
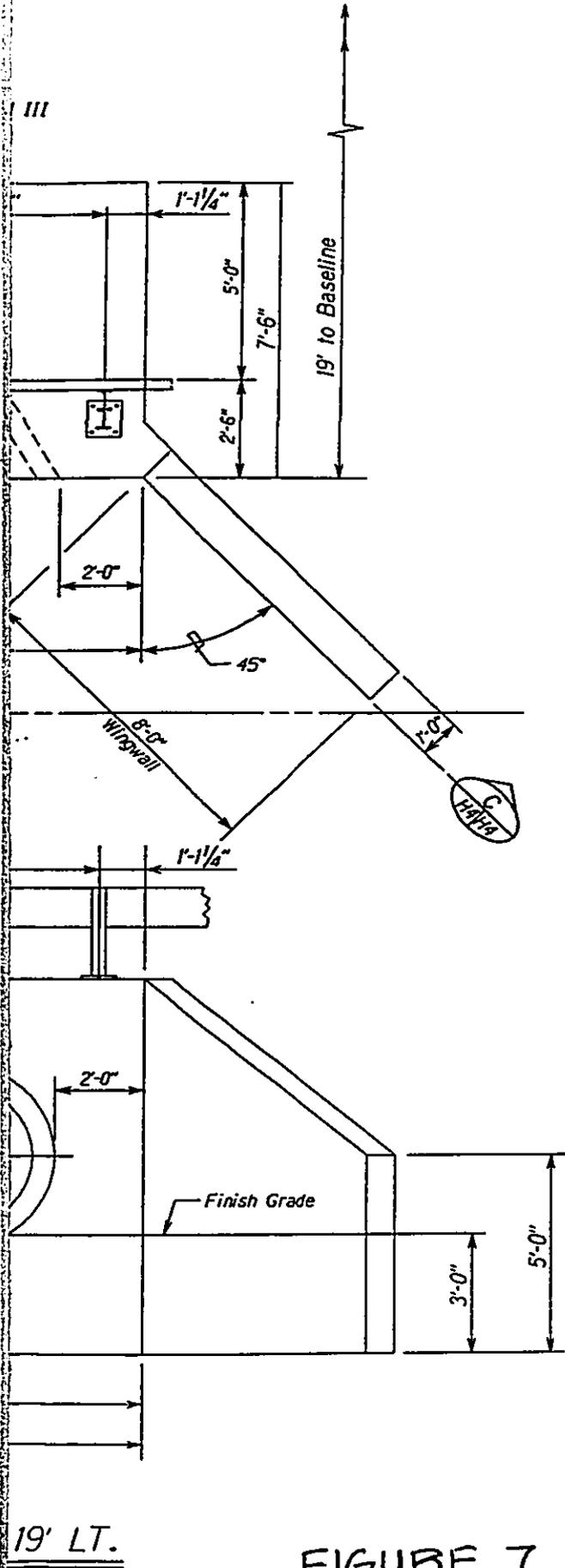
SHEET No. H3 OF 5 SHEETS



ORIGINAL PLAN	DATE
REVISED BY	
DESIGNED BY	
CHECKED BY	
APPROVED BY	

DETAIL OF OUTLET HEADWALL AT STA. 137+86 O/S 19' LT.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-02-95M	1995	8	9



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

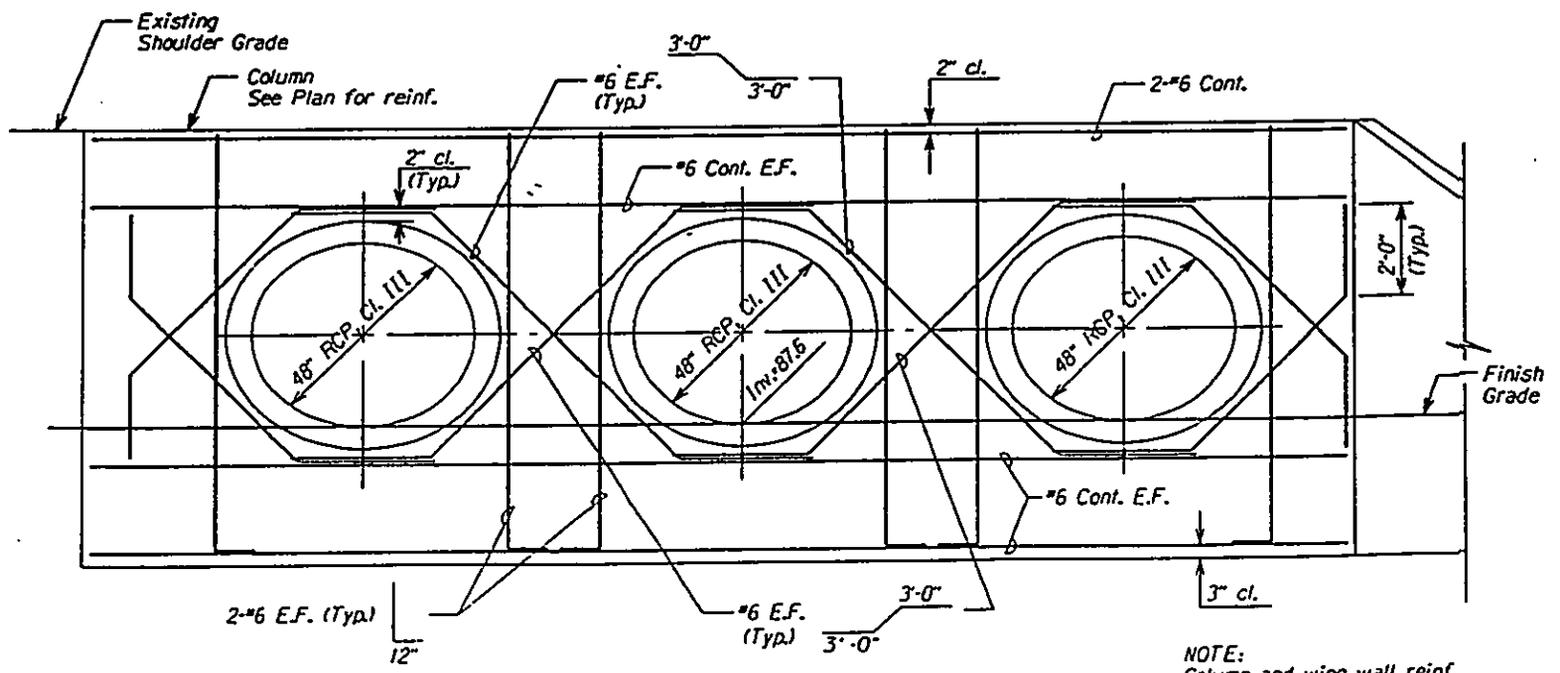
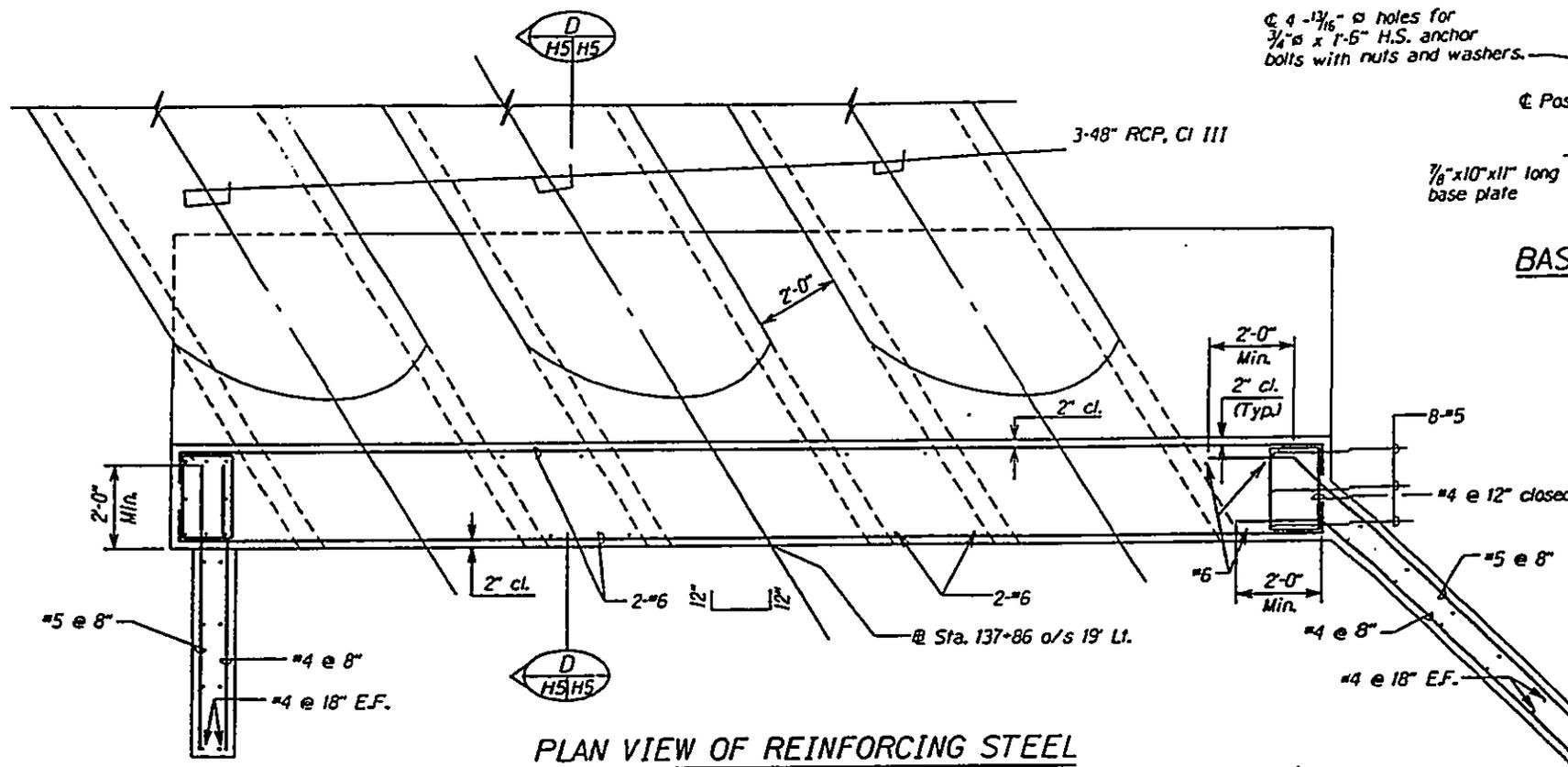
DRAINAGE DETAILS

HANA HIGHWAY
Hanawana Stream Culvert Replacement
Proj. No. 360A-02-95M

Scale: 1/2" = 1'-0" Date: Aug, 1994

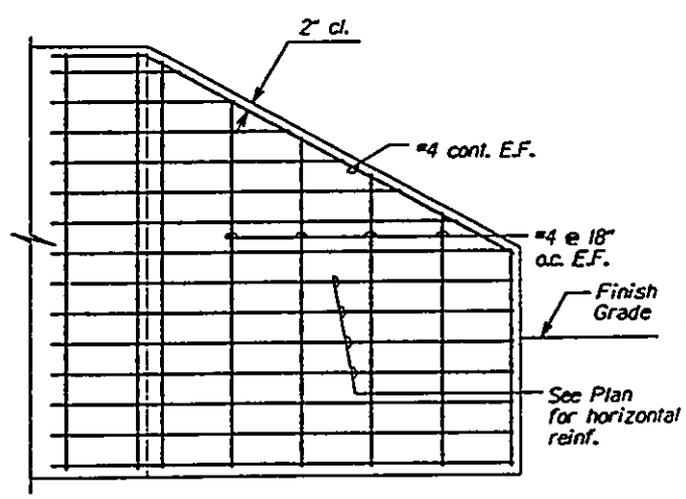
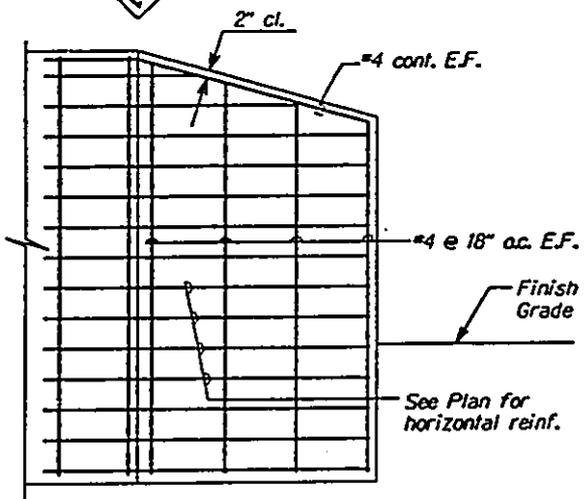
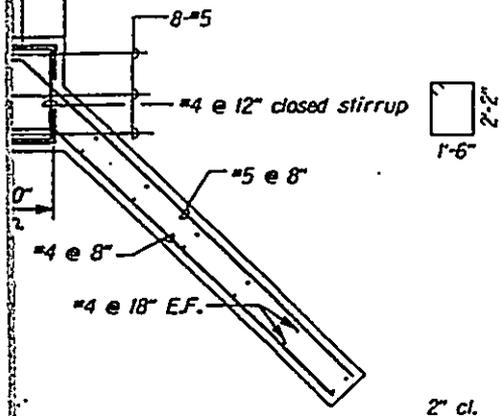
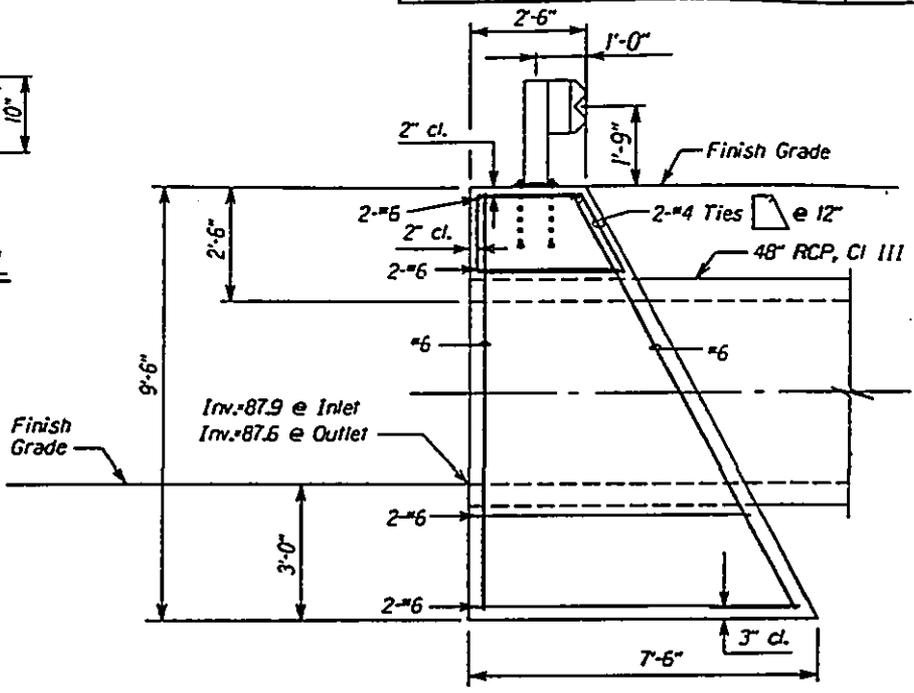
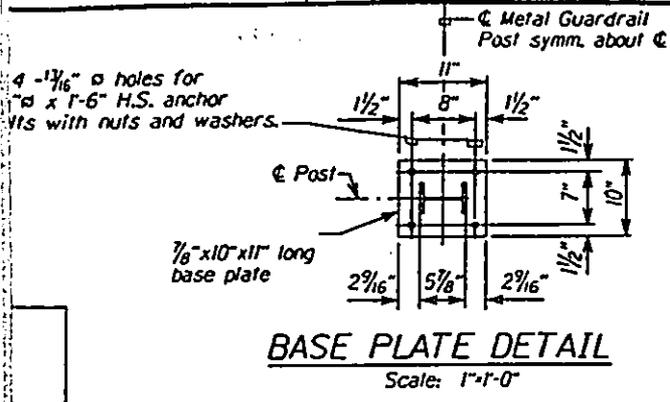
SHEET No. H4 OF 5 SHEETS

FIGURE 7



DESIGNED BY	DATE
CHECKED BY	
APPROVED BY	
PROJECT NO.	
DATE	
SCALE	
BY	
DATE	
BY	
DATE	
BY	
DATE	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-02-95M	1995	9	9



90° WINGWALL 45° WINGWALL
WALL REINFORCING FOR OUTLET WINGWALLS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

HANA HIGHWAY
Hanawana Stream Culvert Replacement
Proj. No. 360A-02-95M

Scale: 1/2"=1'-0" Date: Aug, 1994

SHEET No. H5 OF 5 SHEETS

FIGURE 8