DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

'99 SEP 28 P2:59

OFC. OF ENVIR.
QUALITY CONT.

September 28, 1999

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

Dear Ms. Salmonson:

Subject: Finding of No Significant Impact (FONSI) for Mauna Lahilahi Cultural Garden, Tax Map Key 8-4-01:08 (Por.), Makaha, Oahu, Hawaii

The Department of Design and Construction has reviewed the comments received during the 30-day public comment period which began on May 23, 1999. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the October 8, 1999 OEQC's Environmental Notice.

We have enclosed a completed OEQC Publication Form and four copies of the final environmental assessment.

If there are any questions, please call Mr. Donald Griffin of our Planning and Programming Division at 527-6324.

Sincerely,

for RANDALL K. FUJIKI
Director

RKF:ei

Enclosures

OCT 8 1999
FILE COPY

1999-10-08-OA-FEA-

MAUNA LAHILAHI
CULTURAL GARDEN
Final Environmental Assessment

RECEIVED
'99 SEP 28 P2:59
OFC. OF ENV. QUALITY CONT.

City and County of Honolulu
Department of Design and Construction

September 1999

MAUNA LAHILAHI

CULTURAL GARDEN

Final Environmental Assessment

City and County of Honolulu
Department of Design and Construction

September 1999

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Project Summary 1
1.2 Identification of the Applicant 2
1.3 Identification of Approving Agency 2
1.4 Identification of Agencies Consulted 2

2.0 PROJECT DESCRIPTION 4
2.1 Regional Setting 4
2.2 Location and Background 4
2.3 Description of the Property 4
2.4 Surrounding Land Uses 7
2.5 Project Development Goals and Objectives 7
2.6 Description of the Project 8
2.6.1 Alternatives Considered 8
2.6.2 Mauna Lahilahi Cultural Garden Master Plan 9
2.7 Development Timetable and Approximate Costs 11
2.8 Summary of Impacts and Mitigative Measures 11
2.8.1 Potential Environmental Impacts 11
2.8.2 Proposed Mitigation Measures 12

3.0 REQUIRED PERMITS AND APPROVALS AND CONFORMANCE TO THE GENERAL PLAN AND DEVELOPMENT PLAN 14
3.1 Required Permits and Approvals 14
3.2 Conformance to the General Plan and Development Plan 14
3.2.1 General Plan 19
3.2.2 Development Plan 20

4.0 SUMMARY DESCRIPTION OF THE AFFECTED ENVIRONMENT 23
4.1 Climate 23
4.2 Geology / Topography 23
4.3 Hydrology and Drainage 24
4.4 Soil Types and Agricultural Capability 25
4.4.1 Soil Conservation Service Soil Survey 25
4.4.2 Detailed Land Classification and Agricultural Lands of Importance to the State of Hawai'i 27
4.5 Groundwater Resources 29
4.6 Natural Hazards 29
4.7 Vegetation 30
4.8 Wildlife 30

5.0 GENERAL DESCRIPTION OF THE ACTIONS TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL CHARACTERISTICS 32
5.1 Archaeological and Historic Resources 32
5.2 Roadways and Traffic 34
5.3 Noise 35
5.4 Air Quality 35
5.5 Visual Resources 36
5.6 Social Characteristics 41
5.6.1 Population 41
5.7 Economic Characteristics 41
5.8 Infrastructure Improvements 42
5.8.1 Water Supply Facilities 42
5.8.2 Wastewater Facilities 42
5.8.3 Solid Waste Disposal Facilities 43
5.8.4 Drainage Facilities 43
5.8.5 Electrical/Communications 44
5.9 Public Services 44
5.9.1 Public Schools 44
5.9.2 Health Care Facilities 44
5.10 Police and Fire Protection 45
5.11 Recreational Facilities 45

6.0 DETERMINATION, FINDINGS AND REASONS FOR SUPPORTING DETERMINATION 47
6.1 Significance Criteria 47
6.2 Determination 50

7.0 COMMENTS AND RESPONSES 51
7.1 Comments Received on the Draft EA 51
7.2 Draft EA Comment Letters and the Applicant's Responses 51

8.0 REFERENCES ..... Following Letters

LIST OF FIGURES

Figure		Page
1	Location Map	5
2	Land Ownership Map	6
3	Mauna Lahilahi Cultural Garden Master Plan	10
4	State Land Use District Boundary Map	15
5	Wai'anae Development Plan Map	16
6	Zoning Map	17
7	Special Management Area Map	18
8	Flood Insurance Rate Map (FIRM)	26
9	Soil Conservation Service Soil Survey	28
10	Archaeological Survey	33
11A	Site Photographs	37
11B	Site Photographs	38
11C	Site Photographs	39
11D	Site Photographs	40

LIST OF APPENDICES

A Archaeology Report
A-1 State Historic Preservation Division Letter

1.0 INTRODUCTION

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

1.1 PROJECT SUMMARY

Project Name:	Mauna Lahilahi Cultural Garden
Applicant:	Department of Design and Construction Parks Planning Branch City and County of Honolulu
Land Area:	TMK: 8-4-01: 08 (portion) Total Project Area: 5.4 acres
Existing Use:	The project site is currently generally vacant. Existing on the site are a gravel driveway and parking area, house foundation remnants, and overgrown landscaped gardens and lawns.
Proposed Use:	The proposed cultural garden use will be a gathering place to perpetuate the Hawaiian culture. Improvements will include a new paved parking area, open pavilion, restroom/shower facility, lawn and garden areas, and picnic facilities.
State Land Use District:	Urban District
Wai'anae Development Plan Land Use Map:	Residential
City and County of Honolulu Zoning:	R-10 Residential
SMA:	The site is in the Special Management Area
Action Requested:	Special Management Area Use Permit (City and County of Honolulu)
EA Approving Agency:	City and County of Honolulu, Department of Design & Construction
Agencies Consulted:	Various City/State Agencies and various community groups

1.2 IDENTIFICATION OF APPLICANT

The land owner is the City and County of Honolulu. The agency preparing the master plan and acting as Applicant for the required entitlements is the Department of Design and Construction Division of Planning and Programming.

To identify the appropriate uses and landscape elements for the subject property, the Department of Design and Construction and has contracted with PBR Hawaii to prepare a Master Plan and applicable environmental documents in compliance with Chapter 343, *Hawai'i Revised Statutes*. Therefore, in accordance with Chapter 343, HRS, the Department of Design and Construction is the proposing agency for the project whose mailing address and primary contact person is listed below:

Mr. Randall Fujiki, Director
Department of Design and Construction
650 South King Street, 9th Floor
Honolulu, Hawai'i 96813

1.3 IDENTIFICATION OF APPROVING AGENCY

In accordance with Subchapter 4, Section 11-200-4, Hawai'i Administrative Rules, "the mayor, or an authorized representative, of the respective county whenever an action proposes only the use of county lands or county funds" shall be the final authority to accept a statement. Consequently, the Mayor of the City and County of Honolulu has designated the City's Department of Design and Construction as the Approving Agency for this project.

1.4 IDENTIFICATION OF AGENCIES CONSULTED

Consulted agencies or agency documents which provided information in the preparation of this environmental assessment include the following:

City Agencies:

Board of Water Supply
Department of Design and Construction
Department of Environmental Services
Department of Facility Management
Department of Parks and Recreation Services
Department of Planning and Permitting
Honolulu Police Department
Honolulu Fire Department

State Agencies:

Department of Business, Economic Development and Tourism, State Office of Planning
Department of Health
Department of Land and Natural Resources
Department of Land and Natural Resources, Historic Preservation Division
Department of Transportation
Office of Environmental Quality Control
State Land Use Commission

Federal Agencies:

U.S.D.A. Resource Conservation and Development
U.S. Department of the Army
Federal Emergency Management Agency

Community Organizations:

Community Advisory Committee
Friends of Mauna Lahilahi (now disbanded)
Wai'anae Coast Neighborhood Board No. 24

2.0 PROJECT DESCRIPTION

The proposed improvements for the Mauna Lahilahi Cultural Garden, construction activities, and preliminary development timetable and approximate development costs are described in this section.

2.1 REGIONAL SETTING

The proposed project is located in the Wai'anae District, O'ahu, Hawai'i. The Wai'anae District consists of several communities: Nānākuli, Mā'ili, Lualualei, Wai'anae, Mākaha and Mākua. All of the Wai'anae communities are geographically located along the leeward coast or within broad arid valleys of the Wai'anae mountain range.

Traditionally and historically the coastal lands of the Wai'anae area have been important to Hawaiians for its economic, recreational, and cultural resources. Mauna Lahilahi is a prominent landmark along the coastline and the proposed Cultural Garden would appropriately serve as a gathering place for the elders, or kupuna, of the community.

2.2 LOCATION AND BACKGROUND

The project area consists of 5.4 acres of land which was previously used as a residential estate. The subject property is located at Mākaha in the Wai'anae District of the City and County of Honolulu, O'ahu, Hawai'i (Figure 1).

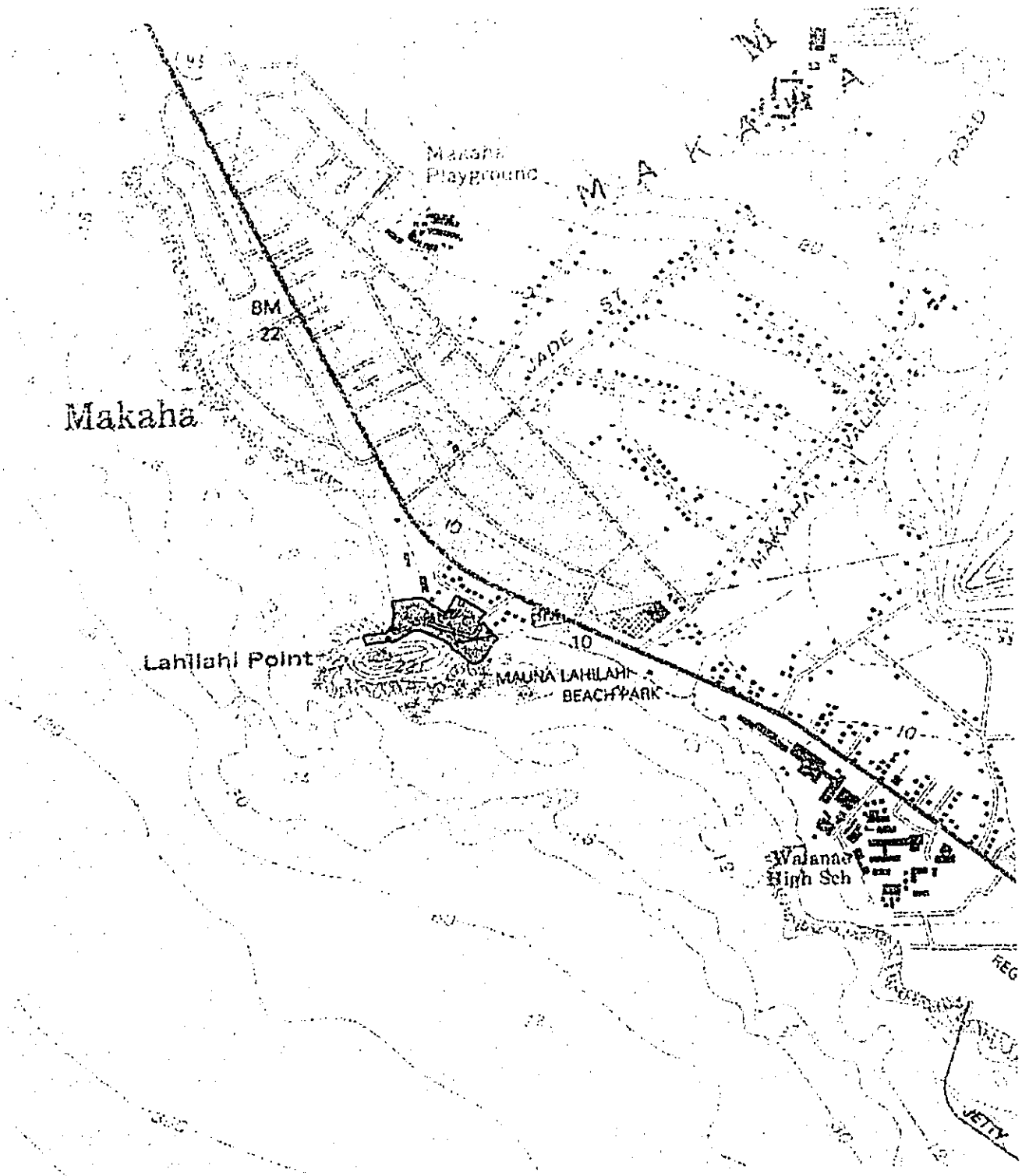
Mauna Lahilahi means "thin mountain." The small hill, 231 feet high, is so thin that it appears to have been cut with a knife. The mountain divides the shoreline of the peninsula into two separate beach areas. The beach to the west side was called Papaoneone, "sandy shelf," while that to the east was called Laulauwa'a, "canoe paddle blade." Laulauwa'a is known today as Mauna Lahilahi Beach Park (Clark 1977).

2.3 DESCRIPTION OF THE PROPERTY

The project area encompasses 5.4 acres of land and is comprised of a portion of Tax Map Key (TMK) 8-4-01:08 (Figure 2). The subject property was formerly used as a residential estate by the Waterhouse family. All residential uses have been abandoned and the house has been removed. The property presently consists primarily of landscape overgrowth and the remanent house foundation.

The Mauna Lahilahi landform, which is not a part of the subject project although part of the City's overall property, dominates the landscape on the south. This 231-foot high mountain creates a sense of enclosure and privacy through its steep slopes.

Presently, the park is not open to the public and is secured by a locked gate. There is no regular maintenance staff assigned to Lahilahi. However, community members who have "adopted" the



LEGEND

Project Area

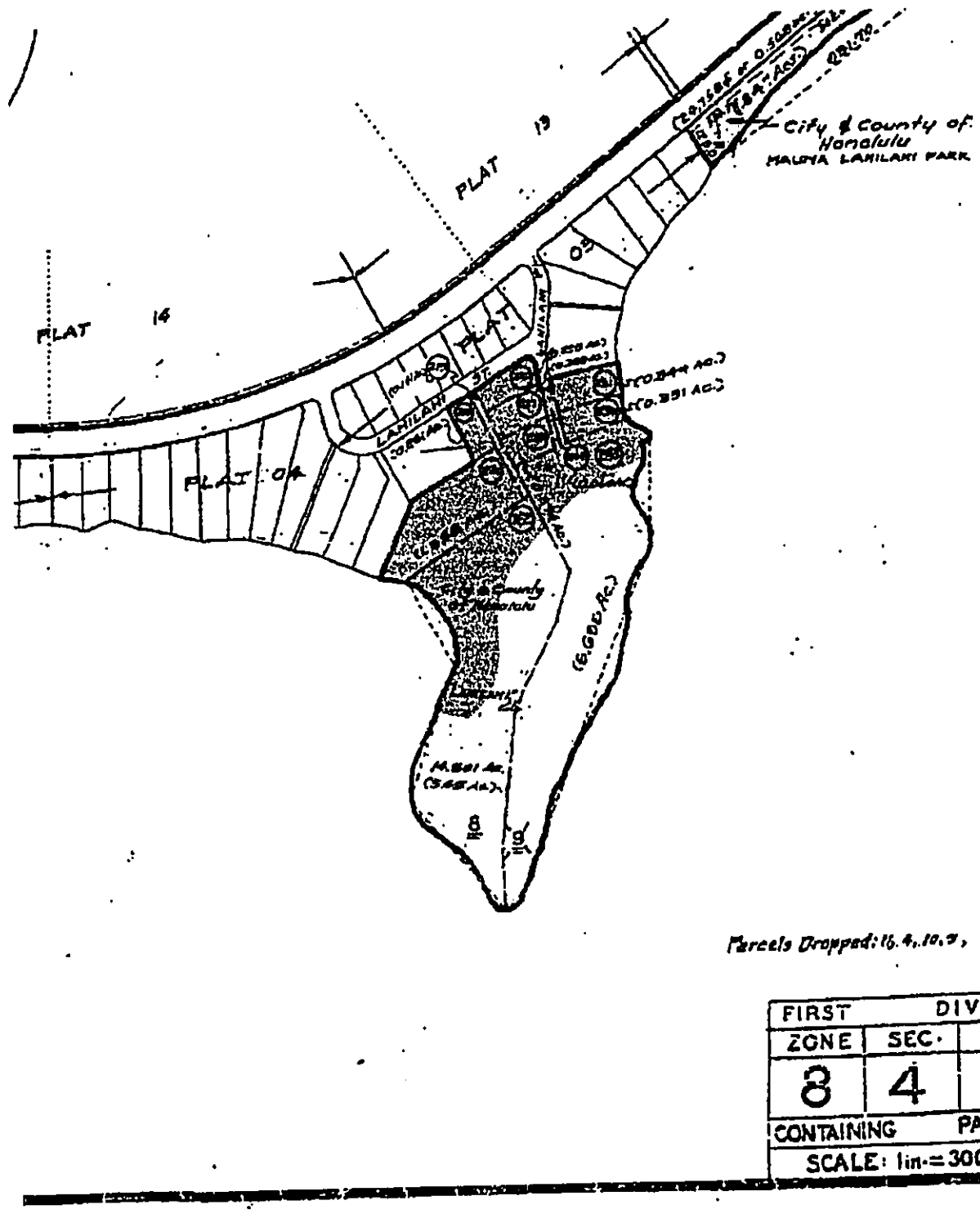
FIGURE I
Location Map

Mauna Lahilahi
Cultural Garden

0 500 1000
FEET

September 1999

PBR HAWAII



LEGEND

Project Area

FIGURE 2
Land Ownership Map

Mauna Lahilahi
Cultural Garden

September 1999

park have organized work days to clean the park and maintain some lawn areas. The lawn is mowed and watered by volunteers on an as needed basis.

2.4 SURROUNDING LAND USES

The site is on a peninsula and is bounded to the north by the existing Lahilahi Street and single and multi-family residential properties, on the south by Mauna Lahilahi, and to the east and the west by the ocean. The beach to the east is a part of Mauna Lahilahi Beach Park, and to the west is a part of the overall Mākaha shoreline. Access to the property is from Farrington Highway through Lahilahi Street and Lahilahi Place.

To the north of Mākaha is the small community of Kea'au, and to the south are the communities of Wai'anae, Mā'ili, and Nānākuli. Wai'anae High School is approximately ½mile to the south.

The neighboring 'Ewa District facilities such as the Ko Olina Resort, the City of Kapolei, Campbell Industrial Park and surrounding developments are within a short driving distance from the subject beach park.

2.5 PROJECT DEVELOPMENT GOALS AND OBJECTIVES

The project goals and objectives have been developed through collaboration between the community and the City park planning staff. A Community Advisory Group and The Friends of Mauna Lahilahi (now disbanded) participated in a series of planning sessions with the City and its consultant, PBR Hawai'i, to establish a foundation for the development of the master plan for the Cultural Garden. The goals and objectives are described below:

1) Develop Mauna Lahilahi as a gathering place to perpetuate the Hawaiian culture.

   a. Create a setting for the kupuna to gather to pass on their knowledge and wisdom to the community, especially the youth of the Wai'anae coast.

   b. Provide a setting for the community to practice the arts and crafts of the Hawaiian culture.

2) Preserve, protect and enhance the cultural resources within the park.

   a. Protect the existing resources, such as the archaeological sites, petroglyphs and native plants.

3) Restore, enhance, and maintain particular aspects of the estate's garden.

   a. Selectively preserve particular elements of the Waterhouse garden.

   b. Enhance the garden with coastal native plants used in Hawaiian culture.

4) Provide a park setting that is safe, accessible and considerate of the surrounding neighborhood.

   a. Provide pedestrian access to the beach.

   b. Design park and park facilities to discourage vandalism and other illicit behaviors.

   c. Consider the nearby neighbors' privacy and safety in siting the park facilities.

   d. Keep facilities to a minimum.

2.6 DESCRIPTION OF THE PROJECT

2.6.1 Alternatives Considered

In compliance with the provisions of Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, Section 11-200-10(6), the alternatives considered are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts. The feasible alternatives must also realistically address the project's economic requirements while also responding to the surrounding land uses that will be impacted by the project. In conformance with applicable regulations, other possible alternatives have been investigated to identify alternative design elements, appropriate uses for the property (i.e. parking, picnic areas, etc.), and how the project goals and objectives can best be accomplished.

In 1980, an SMP was granted for the proposed project site for a 25-Unit Cluster Development (Resolution 80-121). This project was not built. Hence, the State and City land use zoning classifications for the site are for urban residential development. Subsequently, the property was purchased by the Haggai Institute of Hawai'i, Ltd. who, in 1987, unsuccessfully proposed to develop a facility for institutional use for leadership training. The proposal included facilities for conferences, administration, dining, dormitories and other operational structures.

The City and County of Honolulu subsequently purchased the property with the intention of developing a park. The park is currently a "closed" park and is secured with a locked gate. The alternatives which have been considered are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts.

The "no-action" alternative would not be consistent with stated governmental policies of improving the park but would maintain the site in its current condition.

Based on the alternatives considered, the Preferred Landscape Master Plan (described below) was selected.

2.6.2 Mauna Lahilahi Cultural Garden Master Plan

The Mauna Lahilahi Cultural Garden Master Plan was derived though collaboration with the community. Its development will ensure that the long range use of the property will be consistent with surrounding land uses and provide the necessary cultural and recreational facilities desired by the community. The Master Plan is depicted in Figure 3.

The primary objective of the development of the Master Plan improvements is to create a gathering place to perpetuate the Hawaiian culture. The cultural garden will provide a setting for kupuna to pass on their knowledge, especially to the youth of the Wai'anae coast, as well as to provide a setting for the practice of the arts and crafts of the Hawaiian culture. Built structures will be kept to a minimum and will include an open air pavilion and a restroom. An outdoor shower will be placed nearby the restroom.

The Master Plan also preserves, protects and enhances the existing cultural resources within the park such as the archaeological sites, petroglyphs and native plants. The landscape concept will restore, enhance, and maintain particular elements of the Waterhouse estate and enhance the garden with coastal native plants used in Hawaiian culture.

The Master Plan is designed to be safe, accessible and considerate of the surrounding neighborhood. Pedestrian access to the beach will be provided and park facilities will be designed to discourage vandalism and other illicit behaviors.

An open-air pavilion is connected by a concrete walkway between a 13 stall (including seven paved and six overflow gravel stalls) parking lot off of Lahilahi Street and a restroom facility with outdoor shower off of Lahilahi Place. Picnic tables are placed under the existing kiawe and banyan trees along Lahilahi Street.

The existing access road from Lahilahi Place to the Waterhouse residence foundation is improved to be handicap accessible.

Landscape improvements include mauka and makai medicinal gardens, a few new coconut palms, native trees and primarily a continuous grass lawn. Existing trees in good condition will be retained and additional screening plants will be used along the property line of the adjacent tennis courts and Hawaiian Princess condominium. An automatic irrigation sprinkler system would be installed to maintain lawn areas, trees, palms and medicinal gardens.

In support of the development, infrastructure facilities include the new driveway connection to Lahilahi Street, paved and gravel parking lot, drainage improvements, extension of water and wastewater lines, and electrical and communication systems.

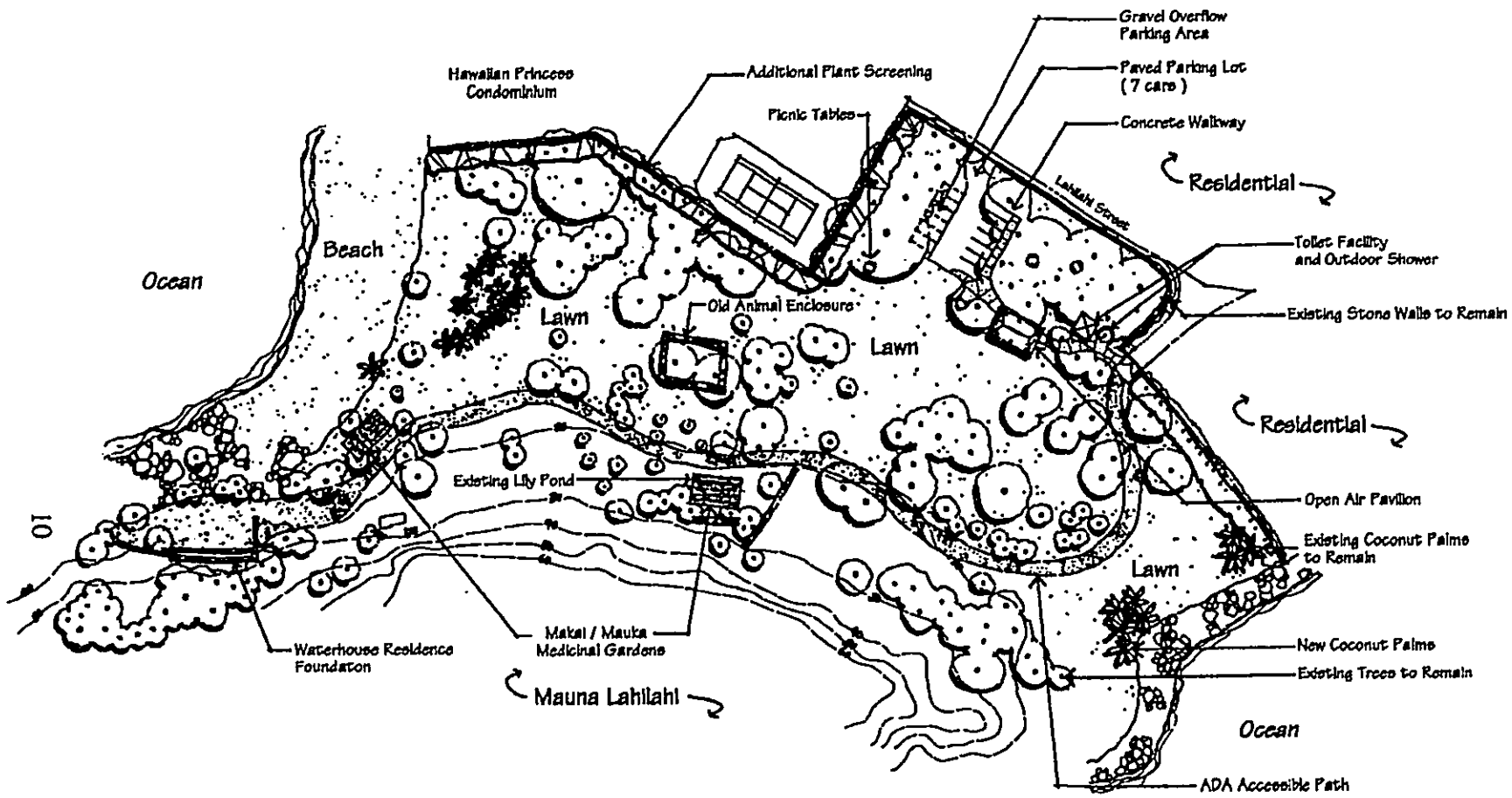


FIGURE 3
Mauna Lahilahi Cultural Garden Master Plan

Mauna Lahilahi
Cultural Garden

0 80 160
FEET

September 1999

PBR HAWAII

2.7 DEVELOPMENT TIMETABLE AND APPROXIMATE COSTS

Construction of the park improvements has not been scheduled; however, once commenced, the improvements could be completed in 12 to 18 months. The cost of implementing the improvements is approximately $765,000.

2.8 SUMMARY OF IMPACTS AND MITIGATIVE MEASURES

2.8.1 Potential Environmental Impacts

Similar to any construction improvement project, potential environmental impacts may occur during and after project construction. A summary of these potential impacts are described in this section and further described in Sections 4 and 5.

Construction Period. The primary environmental impacts anticipated during project construction include noise, air, and water quality impacts and temporary visual impacts. Field surveys have been prepared to identify any potential resources that do exist. There are no known flora and fauna species which are considered to be threatened or endangered. Although the archaeological survey findings have indicated the relative abundance of sites at Mauna Lahilahi, most of these are located on areas of the peninsula which are not planned as part of the park improvements. All significant archaeological sites within the park improvement area will be protected.

Site grading will be required for the parking lot and pavilion construction. Therefore, air quality impacts by potential fugitive dust emissions and vehicular emissions from construction equipment are expected but will be limited. Similarly, drainage impacts could occur as grading progresses, but these are expected to be minor. Precautions will be taken to mitigate any increase in surface flows to the ocean during inclement weather.

The project will not contribute to existing noise levels except during the construction period by the operation of construction vehicles, other equipment, and localized noise such as hammering, trucks backing up, etc. After project construction is complete, noise impacts should be relatively unchanged from the current condition.

Long-Term Operational Period. After construction is completed, the primary air quality impact should be positive. New landscaping and establishment of hard surfaces will contribute toward more effective control of fugitive dust.

Visual impacts of the improvements will not create negative impacts within the Wai'anae Viewshed at Mākaha. Mauna Lahilahi and Mākaha Beach Park have been determined to be prominent coastal land forms. The only structures to be constructed will be an open air pavilion and a restroom. Both structures will not exceed 25 feet in height.

Potential Social and Economic Impacts. The overall goal of the project is to provide improved cultural and recreational opportunities dedicated to the Hawaiian culture for Hawai'i's residents.

According to community members, such a facility would fulfill a long desired need, therefore, the social impact would be positive.

Economic impacts will occur during the construction through direct and indirect employment opportunities. Additionally, the improvement of the existing closed park resource would improve the cultural and recreational opportunities for Leeward coast and O'ahu residents. Each of these impacts, however, would be positive and no mitigation measures will be necessary.

2.8.2 Proposed Mitigation Measures

As indicated above, few potential adverse impacts are expected to result from implementation of the proposed project. Short-term impacts will result during the initial construction phase which will require on-site grading and movement of vehicles within the project site. These activities will generate localized noise and dust during construction periods.

Mitigation measures to minimize adverse air quality would include frequent watering of unpaved construction areas, and mulching and planting of ground cover and other vegetation as soon as possible after construction. Construction activities would comply with all applicable regulations of the City and County of Honolulu and the State Department of Health.

Long-term impacts from the this passive park are not expected to affect adjoining property owners. However, some noise impacts may occur from time to time but will be in accordance to DOH standards. New infrastructure connections must also be developed to accommodate sewerage (restroom) and water for irrigation needs.

Recommended mitigation measures include the following:

Short term:

- Frequent watering during construction activities to maintain dust control.
- Initiate a construction phasing plan which considers wind patterns and residential land uses to minimize dust impacts downwind.
- Dust screening as appropriate to limit fugitive dust.
- Restrict use of construction equipment to daylight hours.
- Establish erosion control fencing during construction to mitigate soil erosion and off-site runoff.
- Phase construction activities as appropriate to limit the amount of noise and dust associated with project construction.

Long term:

- Establish landscaping to maintain long-term air quality and aesthetically integrate the Mauna Lahilahi Cultural Garden into the surrounding landscape and land forms.

- Where appropriate, create landscape buffers between areas of high and low intensity land uses to reduce noise and glare (e.g. parking areas).

- Use of appropriate engineering, design and construction measures to ensure adequate drainage and irrigation of the site.

3.0 REQUIRED PERMITS AND APPROVALS AND CONFORMANCE TO THE GENERAL PLAN AND DEVELOPMENT PLAN

3.1 REQUIRED PERMITS AND APPROVALS

The Mauna Lahilahi Cultural Garden site is designated within the State Urban District by the Land Use Commission (Figure 4). The 5.4 acre parcel is designated as Residential as shown on the City and County Wai'anae Development Plan (Figure 5) and zoned R-10 Residential by the Land Use Ordinance (LUO) (Figure 6). In accordance with the Development Plan Common Provisions, Section 24-1.2(i)(1), these inconsistencies can be administratively reclassified to the appropriate "Park" designation.

The entire site is located in the Special Management Area (SMA) (Figure 7) and there is a 40-foot setback of development from the shoreline. None of the proposed improvements are located within the adjacent State Conservation District (delineated by the 40-foot contour of Mauna Lahilahi).

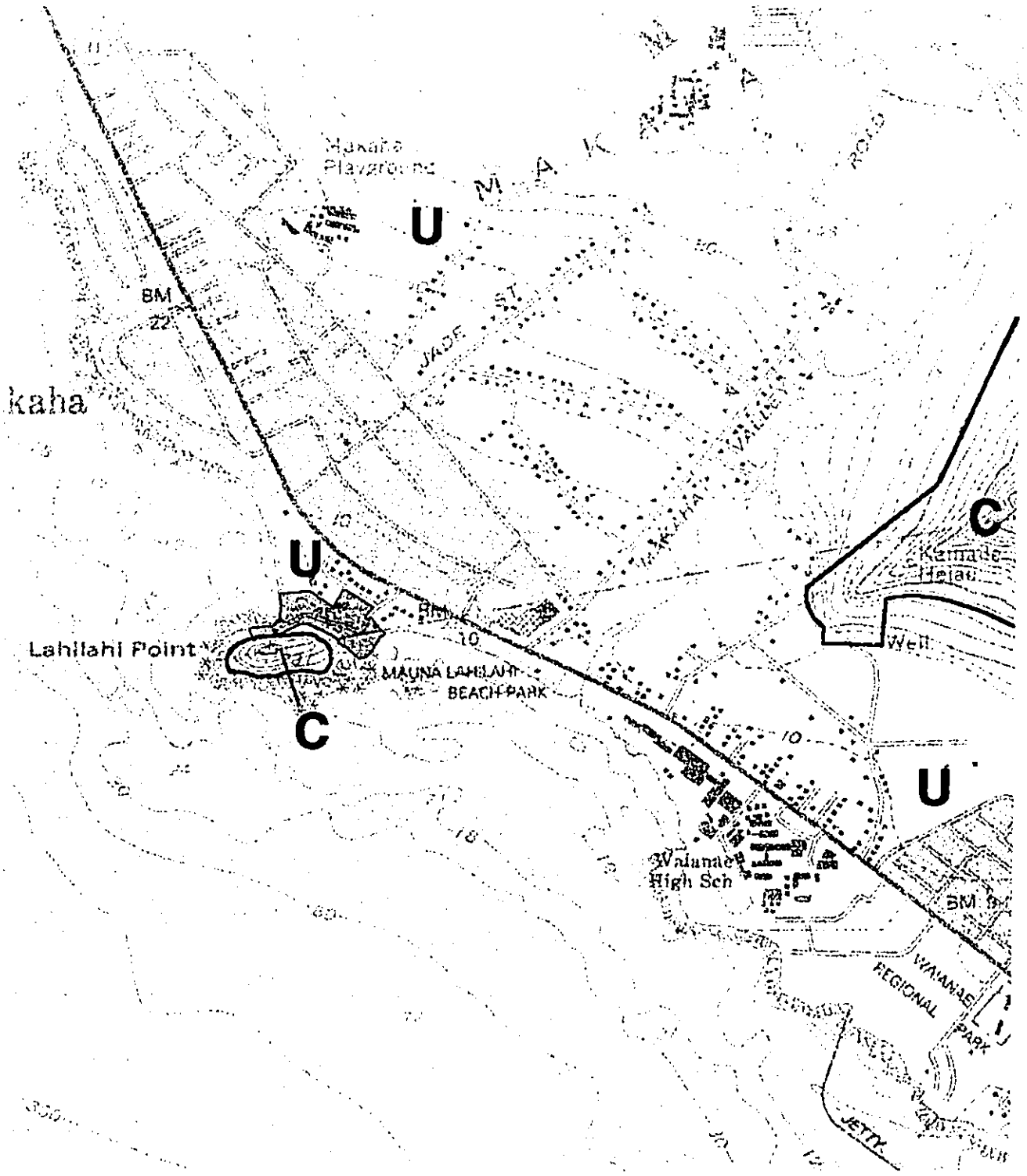
The primary approvals will be the acceptance of the environmental disclosure document in accordance with Chapter 343, *Hawai'i Revised Statutes* ("HRS") and the processing of a Special Management Area Use Permit application. The following is an approximate list of approvals and permits required for the implementation of the proposed plan.

Permit or Approval	Authority
Environmental Assessment / FONSI	Chapter 343, HRS, Office of Environmental Quality Control
Wai'anae Development Plan Amendment	Department of Planning and Permitting Director
Land Use Ordinance	Department of Planning and Permitting Director
Special Management Area Use Permit (SMP)	City Council
Building/Grading Permits	Department of Planning and Permitting

3.2 CONFORMANCE TO THE GENERAL PLAN AND DEVELOPMENT PLAN

The General Plan for the City and County of Honolulu has designated the subject property as part of the "Waianae Development Plan Area".

Development of the proposed property for park uses would directly fulfill many of the objectives and policies of the City's General Plan. The project's relationship to these General Plan Policies and Objectives are described below:



LEGEND

Project Area

FIGURE 4
State Land Use District Boundary Map

Mauna Lahilahi
Cultural Garden

0 500 1000
FEET

September 1999

PBR HAWAII

LEGEND

Project Area

FIGURE 5
Wai`anae Development Plan Map

Mauna Lahilahi
Cultural Garden

0 250 500
FEET

September 1999

PBR HAWAII

LEGEND

- Project Area
- P-1 Restricted
- P-2 General
- R-10 Residential

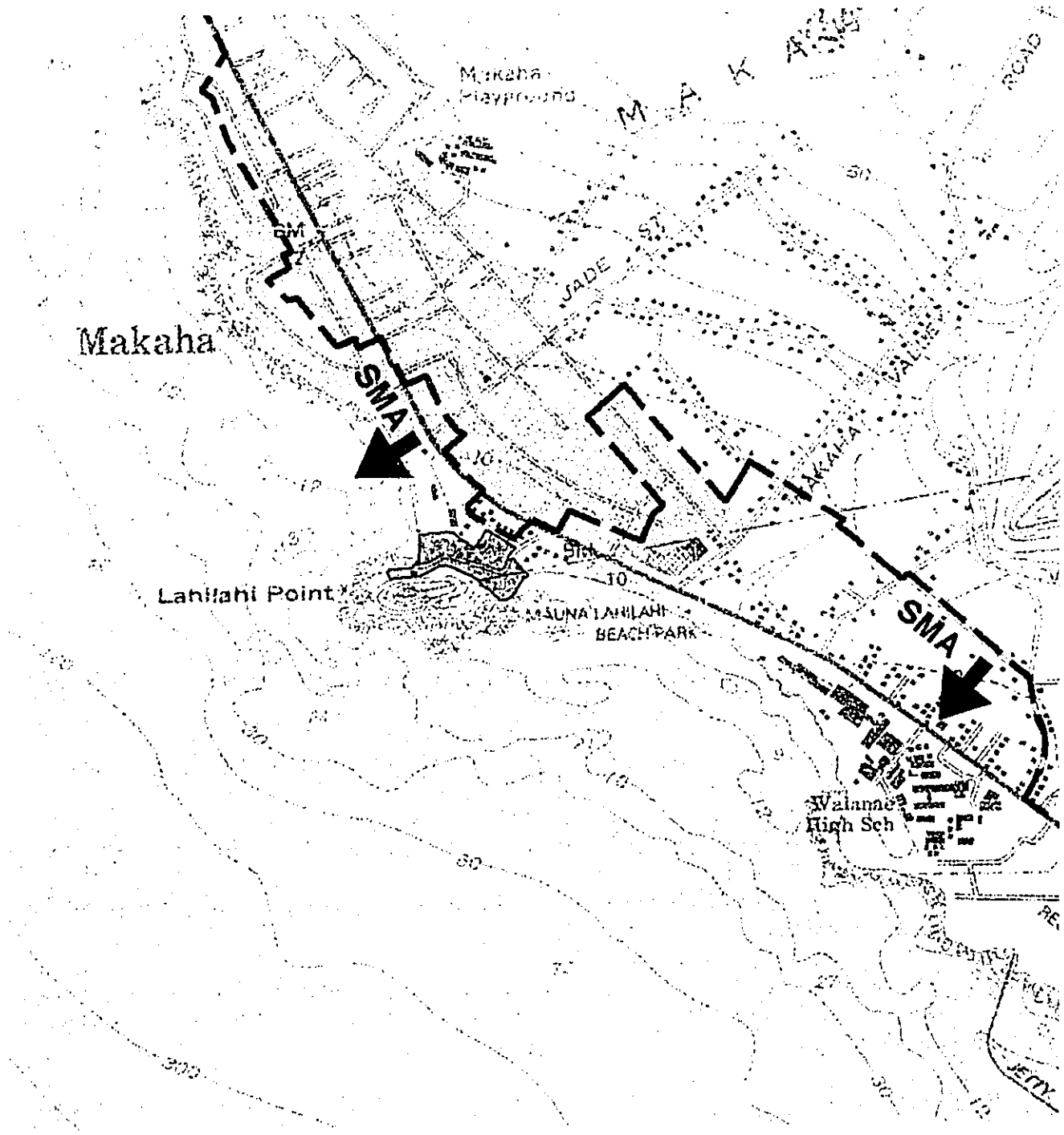
FIGURE 6
Zoning

Mauna Lahilahi
Cultural Garden

0 200 400 FEET

September 1999

PBR HAWAII



LEGEND

Project Area

FIGURE 7
Special Management Area

Mauna Lahilahi
Cultural Garden

0 500 1000
FEET

September 1999

PBR HAWAII

3.2.1 City and County General Plan

The proposed projects implements the objectives and policies of the City and County General Plan in the areas of natural environment, public safety, and culture and recreation. The specific relevant General Plan objectives and policies and their applicability to the proposed Mauna Lahilahi Cultural Garden project are discussed below.

III. Natural Environment

Objective A - To protect and preserve the natural environment

Policy 1 - Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development.

Policy 4 - Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation.

Policy 5 - Require sufficient setbacks or improvements in unstable shoreline areas to avoid the future need for protective structures.

Policy 6 - Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.

Policy 9 - Protect mature trees on public and private lands and encourage their integration into new developments.

Policy 10 - Increase public awareness and appreciation of Oahu's land, air, and water resources.

Objective B - To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

Policy 1 - Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.

Policy 2 - Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas.

Policy 4 - Provide opportunities for recreational and educational use and physical contact with Oahu's natural environment.

Discussion: The proposed plan for Mauna Lahilahi will protect and preserve the unique natural environment. The plans to develop it as a cultural garden park is in anticipation of perpetual protection as a public facility. The low impact plan will maintain large trees, appropriate setbacks

from the shoreline, and avoid slopes. The significant views of the Lahilahi mount will not be compromised from nearby areas as well as heavily traveled roadways.

X. Culture and Recreation

Objective A - To foster the multiethnic culture of Hawaii

Policy 1- Encourage the preservation and enhancement of Hawaii's diverse cultures.

Policy 2 - Encourage greater public awareness, understanding, and appreciation of cultural heritage and contributions to Hawaii made by the City's various ethnic groups.

Objective B - To protect Oahu's cultural, historic, architectural, and archaeological resources.

Policy 1 - Encourage the restoration and preservation of early Hawaiian structures, artifacts, and landmarks.

Policy 2 - Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.

Policy 4 - Promote the interpretive and educational use of cultural, historic, architectural, and archaeological sites, buildings, and artifacts.

Objective D - To provide a wide range of recreational facilities and services that are readily available to all residents of Oahu.

Policy 1 - Develop and maintain community-based parks to meet the needs of the different communities on Oahu.

Policy 2 - Develop and maintain a system of regional parks ad specialized recreation facilities.

Policy 6 - Provide convenient access to all beaches and inland recreation areas.

Discussion: The goals and objectives of Mauna Lahilahi Cultural Garden include the following: 1) Development of the park as a gathering place to perpetuate the Hawaiian culture by creating a setting for the kupuna to gather to pass on their knowledge and wisdom to the community, especially the youth of the Wai'anae coast and to provide a setting for the community to practice the arts and crafts of the Hawaiian culture; and 2) preserve, protect and enhance the cultural resources within the park, such as the archaeological sites, petroglyphs and native plants.

3.2.2 Development Plan

Development Plans (DP), according to the City Charter, are relatively detailed guidelines for the physical development of the island. They must implement and accomplish the objectives of the

General Plan. The Development Plan include two parts - text and maps. The text portion also contains two portions: 1) Common provisions that are common to all eight Oahu development plan areas, and 2) Special provisions that are specific planning area descriptions, urban design principles and controls for the particular planning area and development priorities for each planning area.

There are also two map elements of the DP's - Land Use Maps which define the DP area and distribute the various DP land uses in a manner that implements the General Plan objectives and policies; and Public Facilities Maps that identify planned public and private facilities and infrastructure.

Those sections of the DP Common Provisions and Special Provisions that are applicable to the project are discussed below:

3.2.2.1 Waianae Development Plan

Common Provisions

Sec. 24-1.5 General principles and controls for parks, recreation and preservation areas.

Sec. 24-1.6 Identification of areas, sites and structures of historical significance.

Sec. 24-1.10 Social impact of development.

Discussion: As a cultural park, the subject project area is designed to preserve a significant natural landmark and archaeological sites. The perpetual protection of Mauna Lahilahi and the dedication of the park for cultural teaching by kupuna to youth and young adults will have social benefit for the community.

ARTICLE 9. PART I - SPECIAL PROVISIONS FOR WAIANAE

SECTION 24-9.2. URBAN DESIGN PRINCIPLES AND CONTROLS FOR WAIANAE

(a) Specific Urban Design Considerations

(1) Open Space

The visibility, preservation, enhancement and accessibility of open space areas, as defined in Section 24-1.4 of the development plan common provisions, shall be given high priority in the design of adjacent and nearby developments in Waianae. These areas include, but are not limited to, the slopes of the Waianae mountain range, streams and shoreline, Pokai Bay, Makua Caves, Puu O Hulu Kai, Puu Mailiili, and Mauna Lahilahi.

(2) Public Views

In order to promote pleasing and attractive living environments and panoramic mauka and makai views from public places, views of major landmarks from public places shall be protected whenever possible. Important views include, but are not limited to the following:

(C) Views of Mauna Lahilahi from Farrington Highway at Lahilahi Beach Park and the public beach area north of Mauna Lahilahi.

(3) Height Controls

The general height limits of buildings shall be as follows: Residential - 25 feet

SECTION 24-9.3. DEVELOPMENT PRIORITIES

The planning, funding, and construction of public projects in Waianae shall be guided by policies set forth in Section 24-1.9 of the development plan common provisions. In addition, public plans and programs in Waianae will support the following projects in the priority shown:

(d) Improvement of facilities at public beach parks and the acquisition and preservation of other beach parks.

Discussion: Mauna Lahilahi is publicly noted as a significant natural feature. The development of the cultural garden is in accordance with the design principles and controls and development priorities of the City and County of Honolulu.

3.2.2.2 (Draft) Waianae *Sustainable* Communities Plan

The Waianae *Sustainable* Communities Plan has been prepared in accordance with the Charter-prescribed requirements for Development Plans and is to be accorded force and effect as such for all Charter- and ordinance-prescribed purposes.

The preliminary draft of the revised Waianae Sustainable Communities (Development) Plan recommends that the proposed project site area be included within the Rural Community Boundary. This boundary also contains open space elements (where appropriate), the preservation of which is essential to the character of the rural community being defined. They may include lands designated as "park" ... .

Discussion: The proposed park is consistent with the open space element of the Plan. Open space in the area is essential to preserving the rural character of Waianae. The proposed project is also consistent with the plan proposal to create and preserve areas makai of Farrington Highway (Coastal Lands) for open space, beach parks, and public access and with the proposed policy to protect historic and cultural resources.

4.0 SUMMARY DESCRIPTION OF THE AFFECTED ENVIRONMENT

A general description of the project's environmental, technical, and economic characteristics is presented in this section.

4.1 CLIMATE

Existing Conditions

The Wai'anae District is characterized as semiarid. The district has a mean annual rainfall of approximately 20 inches, which occurs primarily during the months of October through April. The mean annual temperature is 74 degrees F, and daily temperatures approach the mid-60s during winter evenings and mid- to high-80s on hot sunny days during the dry months from May through September.

The prevailing trade winds are from the northeast; however, convection winds caused by the heated land mass and local topographic features result in considerable local variations in the prevailing wind patterns along the coast. Similarly, the area experiences midday sea breezes followed by offshore breezes during the evening. Southerly "kona"winds associated with southerly storms are most common during the late winter and early spring, but can occur at any time of the year. Northerly and northwesterly storms that commonly occur during the early and late winter also affect the coastline.

Potential Impacts and Mitigative Measures

The mild climate and moderate rainfall conditions provide an ideal environment for the activities envisioned for the Cultural Garden. An open air pavilion will provide shelter from the sun and occassional rain. Additional trees may be incorporated into project landscaping where none currently exists to provide an additional level of natural cooling.

4.2 GEOLOGY / TOPOGRAPHY

Existing Conditions

Generally, the Wai'anae District consists of a coastal plain and the Wai'anae mountain range with intruding valleys. Urban development has primarily occurred on the coastal plain, with agricultural activities extending into inland areas. Most of the land area is comprised of the Wai'anae mountain range with its rugged topography of near-vertical cliffs and amphitheater-headed valleys.

The project is situated at the southern boundary of Mākaha Valley, one of the major valleys located on the dry leeward coast of O'ahu. Mauna Lahilahi, a rocky peak that abruptly rises to an elevation of 231 feet above mean sea level (msl) occupies about 60 percent of the Lahilahi peninsula and dominates the landscape.

In areas above the 40-foot elevation, the surface is primarily composed of outcrops of basalt bedrock and boulders, while lower slopes are covered by talus. The surface in these areas is primarily bare rock, however, shallow pockets of soils and sediments are intermittently present. The entire peak is considered to be part of the lower member of the Wai'anae Volcanic Series and "is a remnant of a deeply drowned interstream divide" (Stearns 1939:58 in Komori 1987:8).

An apron of coral conglomerate circles the mount. The elevation of the exposed conglomerate material ranges from less than 3 feet msl near the ocean to about 15 feet msl on the inland side of Lahilahi. The presence of the raised reef shows that the peak has been isolated from the main island during fluctuations in sea level, however, the last large change occurred well before human occupation of the Hawaiian islands (Macdonald 1983:284 in Komori 1987).

The cultural garden site consists of approximately 5.4 acres of flat land located to the northeast of the Lahilahi mount. The unimproved shoreline areas to the south, east, and west of the mount consist of sandy beaches and rocky coastline. The seaward western tip is known as Lahilahi Point.

Potential Impacts and Mitigation Measures

Impacts on the physiography and geology of the project site could be caused by alterations to accommodate the planned improvements. The planned alterations which consist of landscape improvements and the construction of a small open air pavilion, however, are relatively insignificant compared to the overall physiographic and geologic character of the site and region. As such, significant impacts resulting from the proposed project are not expected.

Due to the expected lack of significant impacts on the physiography and geology of the project site or region, mitigation measures to minimize potential adverse impacts are not warranted. Appropriate engineering, design and construction measures would be taken to minimize potential erosion due to the grading of soils during construction.

4.3 HYDROLOGY AND DRAINAGE

Existing Conditions

The Wai'anae Coast is relatively dry, receiving less than 20 inches of rainfall per year along the coastline and up to about 30 inches per year in the lower valleys. As such, there are no perennial streams in the coastal plain area of the district. Some streams, such as the Nānākuli, Lualualei, Wai'anae, Mākaha and Mākua, have small perennial flows only in the high elevations (greater than 600 feet MSL). All streams in the low-lying areas are intermittent. There are no streams within the Lahilahi project area.

Rainfall at the higher elevations is predominantly orographic, which does not result in appreciable surface runoff because of its low intensity. Periods of heavy runoff are generally associated with frontal type (kona) storms.

Groundwater recharge from rainfall occurs primarily in the mountain area and is stored in the volcanic structure of the region. Excess overland runoff from the mountain region, except during the few heavy storms that the district experiences, eventually percolates into the coastal coral line rocks and becomes part of the groundwater resource. As such, Lahilahi does not contribute to groundwater recharge.

The Federal Emergency Management Agency classifies flood hazard zones as part of the Flood Insurance Program for the City and County of Honolulu. The Lahilahi shoreline and park area is designated on the Flood Insurance Rate Map ("FIRM") in Zones VE and AE (Figure 8).

The western and eastern ends of the park site are in Zone VE (el 16 and 14 respectively) which is designated as areas within the 100-year flood plain with coastal flooding with velocity hazard (wave action) and base flood elevations determined.

The eastern portion of the proposed project is located in Zone AE (el 16 and 12). Zone AE is an area located within the 100-year flood plain where the base flood elevations are determined.

Potential Impacts and Mitigative Measures

Adverse impacts to the hydrological and drainage characteristics of the project site are not expected to result from the proposed improvements due to the minor amounts of anticipated grading. Similarly, no major impacts to the surface drainage patterns are expected to occur. As such, mitigation measures to minimize potential adverse impacts do not appear warranted at this time.

Best management practices (BMPs) for temporary erosion control during the construction period will be incorporated. Mitigative measures would include appropriately sized on-site ponding basins for desilting storm runoff prior to discharge into the existing drainages and the nearshore waters.

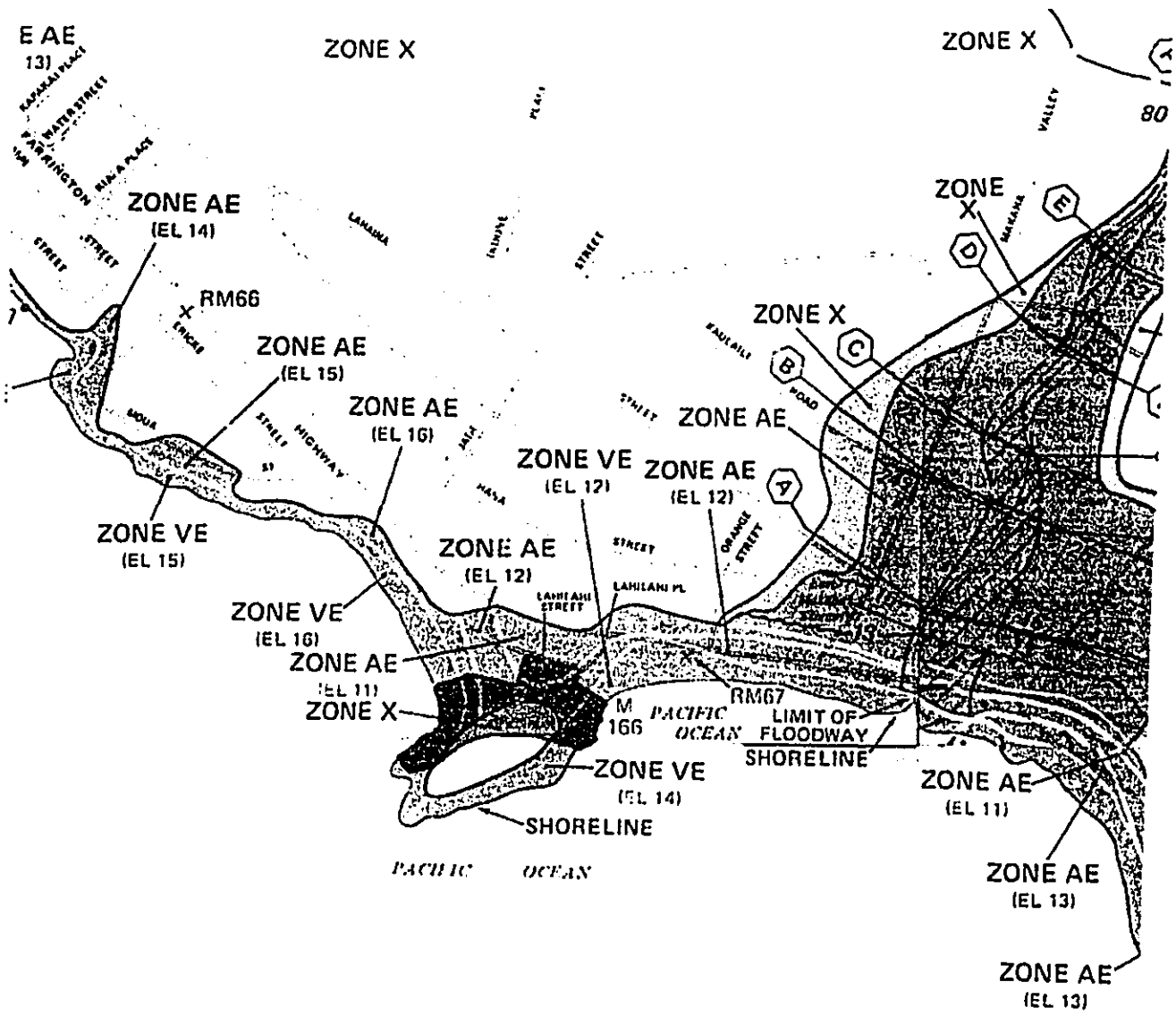
The open air pavilion and toilet facility will be elevated as necessary to comply with all City requirements within the flood zone.

4.4 SOIL TYPES AND AGRICULTURAL CAPABILITY

4.4.1 Soil Conservation Service Soil Survey

Existing Conditions

The *Soil Survey of Islands of Kaua'i, O'ahu, Maui, Moloka'i and Lāna'i, State of Hawai'i* (1972) was prepared by the U.S. Department of Agriculture Soil Conservation Service (SCS) and the University of Hawai'i Agricultural Experiment Station. These reports are patterned after a soil classification procedure adapted for nationwide, uniform application. Soil types are ranked according to their suitability for most kinds of crops (ranging from Class I soils which have few limitations that restrict their use, to Class VIII soils which have limitations that preclude their use



LEGEND

Project Area

Zone VE — Area within 100-year flood plain with coastal flood with velocity hazard (wave action); base flood elevations determined

Zone AE — Area within 100-year flood plain with base flood elevations determined

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

FIGURE 8
Flood Insurance Rate Map (FIRM)

Mauna Lahilahi
Cultural Garden

0 250 500
FEET

September 1999

PBR

for commercial plant production and restrict their use to recreation, wildlife habitat, water supply or aesthetic purposes).

Soil type found on the park site is shown on Figure 9. The predominant soil types at the project site are Waialua silty clay and Rock land. The Waialua series consists of moderately well drained soils on alluvial fans on O'ahu found on smooth coastal plains. These soils developed in alluvium weathered from basic igneous rock and are appropriate for agricultural uses.

Rock land is made up of areas where exposed rock covers 25 to 90 percent of the surface. The rock outcrops and very shallow soils are the main characteristics. Beaches occur as sandy, gravelly or cobbly areas. They are washed and rewashed by ocean waves. The beaches consist mainly of light colored sand derived from coral and sea shells.

Potential Impacts and Mitigative Measures

The Mauna Lahilahi Cultural Garden site is dedicated to cultural and passive recreational uses and the planned improvements to the park will include makai and mauka gardens for medicinal plants. Previous use of the property was residential in nature. The on-site gardening activities will contribute to the perpetuation of cultural agricultural knowledge which will be shared between generations of Hawaiians. Alteration through grading is not planned for the Rock land and Beaches areas.

4.4.2 Detailed Land Classification and Agricultural Lands of Importance to the State of Hawai'i

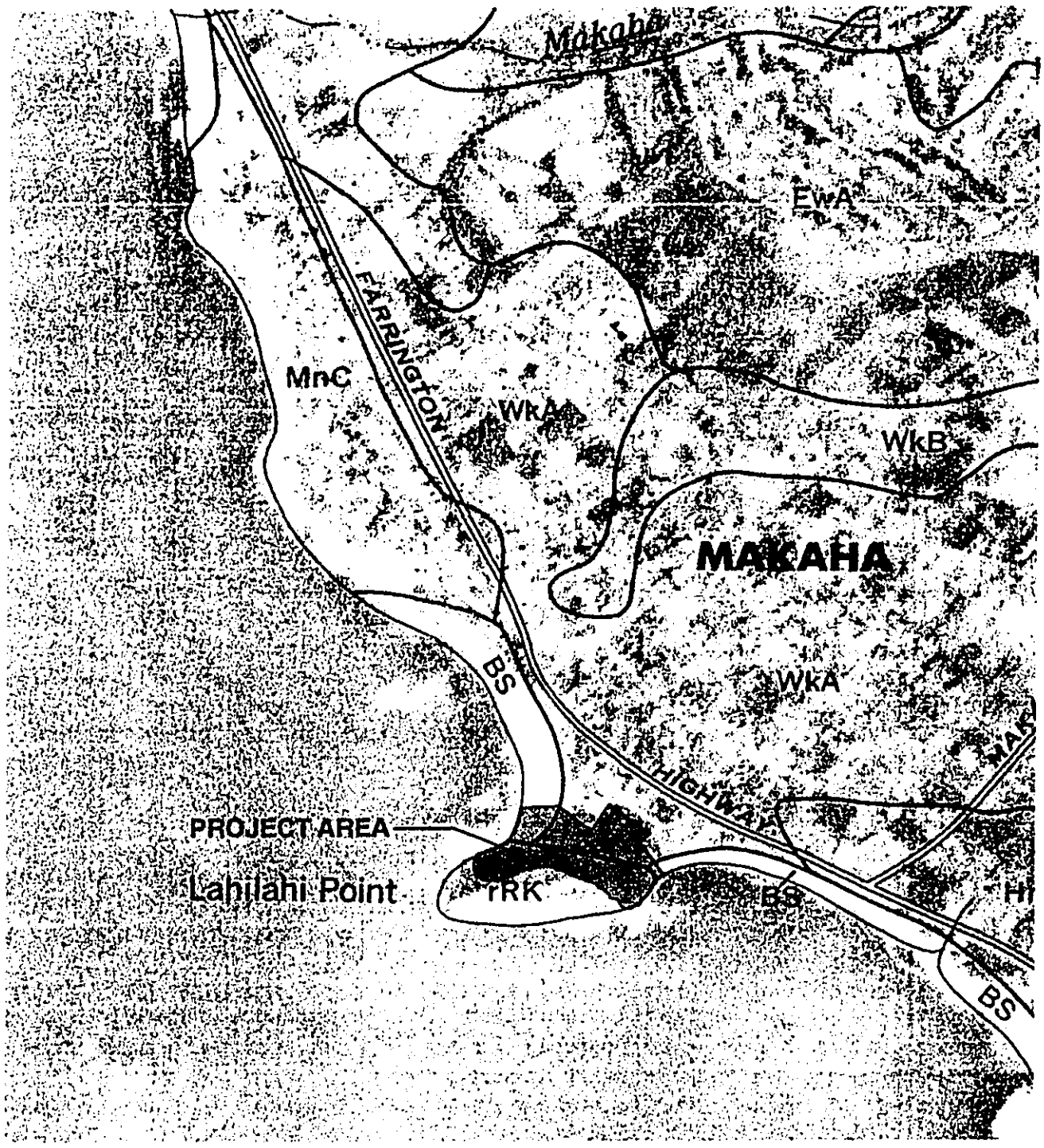
Existing Conditions

The *Detailed Land Classification* (1965 through 1972) series was produced by the Land Study Bureau (LSB) of the University of Hawai'i for each island to develop a land inventory and productivity evaluation based on statewide "standards" of crop yields and levels of management.

The *Agricultural Lands of Significant Importance to the State of Hawai'i* (ALISH) (1977) system consists of the mapped identification of three broad classes of agricultural land based, in part, on the criteria established by the Soil Conservation Service. "Prime Agricultural Land", "Unique Agricultural Land" and "Other Important Agricultural Land."

Potential Impacts and Mitigative Measures

In addition to the medicinal gardens, the landscape plantings will include other native trees and shrubs which are important to the Hawaiian culture. Therefore, the existing proposed improvements will make an important contribution to the traditional agricultural knowledge base.



LEGEND

- Project Area
- WkA — Waialua Silty Clay, 0 to 3% slopes
- rRK — Rock Land
- BS — Beaches

FIGURE 9
Soil Conservation Service Soil Survey

Mauna Lahilahi
Cultural Garden

0 250 500 FEET

September 1999

PBR HAWAII

4.5 GROUNDWATER RESOURCES

Existing Conditions

Groundwater in the vicinity of the study area occurs in the Wai'anae volcanic aquifer and the Pearl Harbor groundwater aquifer.

Currently, only periodic watering of the grounds is done by community volunteers from existing hose bibs hooked up to the Board of Water Supply system. The present usage of water is approximately 2,500 gallons per month during the drier months.

Potential Impacts and Mitigative Measures

The planned project improvements will not require the development of additional water supply wells, construction of storage and pumping facilities, and expansion of the potable distribution system. It is anticipated that the additional water required for expanded irrigation and comfort station operation will be 6,500 gallons per day (gpd) mgd and will continue to be provided by the City BWS system.

4.6 NATURAL HAZARDS

Existing Conditions

Natural hazards are events such as tsunami, earthquakes, floods, hurricanes, soil slippage, and volcanic hazards. Lahilahi may be subject to hurricanes and minor earthquakes; however, the site is not unique to these potential hazards. Earthquakes in the Hawaiian islands are associated with volcanic eruption or tectonic movement. Volcanic hazards in the area are considered minimal due to the extinct status of former volcanoes. Seismic hazards in the Wai'anae area are no greater than other locations on O'ahu and are accounted for in design standards and the building codes. The Wai'anae area, along with other areas of the State, have been subjected to destructive hurricanes twice in the past two decades. Lahilahi is no more or less prone to damaging hurricane impacts than other areas of this coastline.

Normal seasonal high surf wave run-ups (not associated with tsunami or hurricanes) which occur directly to the north of the project and impact the adjacent condominium building has recently been mitigated through temporary hydraulic barriers consisting of geotextile materials. Off-shore improvements are planned in the future.

Potential Impacts and Mitigation Measures

This area of Mākaha is served by a siren warning device located along Farrington Highway. Police and fire services are located within minutes from the park in Wai'anae.

The proposed structures (e.g. open air pavilion and restrooms) would be designed according to building standards established by the City and County to minimize damage by strong winds. The

master planned improvements are setback more than 300 feet from the shoreline, well above and beyond the high wash of the waves.

4.7 VEGETATION

Existing Conditions

The vegetation on the project site generally varies according to its proximity to the ocean. Although native plants such as hinahina and 'ilima (*Sida fallax*) are present, modern introductions dominate the flora of the area. Kiawe (*Prosopis pallida*) are the most numerous. In the coastal area of the project site, two endemic plants are fairly common, hinahina-ku-kahakai (*Heliotropium anomalum*) and pā'ū-o-Hi'iaka (*Jacquemontia ovalifolia*). Coconut palms, kiawe, wiliwili, kou and hala are common in the interior of the property, along with shrubs such as tiare gardenia, bougainvillea and aloe. Various other introduced flowering shrubs are common, having been planted by the Waterhouse family. A common sandalwood known as 'ili-ahi, (*Santalum freycinetianum*) is found near the old house site and night blooming cereus (*Hylocereus lemairei*) is seen on the rock faces of Mauna Lahilahi. Common bermuda grass and buffelgrass are spread throughout the site. None of the plant species are considered rare or endangered.

Coconut trees (*Cocos nucifera*), kou (*Cordia subcordata*), ti (*Cordyline terminalis*), and a number of other plants that were economically useful to prehistoric Hawaiians are present, however, these are isolated examples that were cultivated and maintained by modern landscaping activities.

None of the plants observed on the site during the field studies is a threatened or endangered species; nor is any plant a species of concern (U.S. Fish and Wildlife Service 1997). There are no sensitive native plant-dominated communities on the project site.

Potential Impacts and Mitigative Measures

Medicinal gardens consisting of native plantings are planned as integral components of the Mauna Lahilahi Cultural Garden. Other native and Polynesian introduced plants will be incorporated into the new landscape plantings. Polynesian introduced plants are all those species which were brought to the islands prior to Western contact. Some of the plants already occur on the improved portions of the project site. The following Polynesian introduced plants are excellent shade trees for coastal areas exposed to salt spray: milo *(Thespesia populnea)*, kou *(Cordia subcordata)*, and kamani *(Calophyllum inophyllum)*. Hence, the proposed project improvements should have a positive impact on the botanical resources.

4.8 WILDLIFE

Existing Conditions

Mammals found within this area include the mongoose and feral cats and dogs. Common birds including the mynah, doves and sparrows, and in winter, the golden plover, have been spotted. Mice

and rats are also likely to be found; typical of this type of urban habitat. Frigate birds are frequently seen soaring above the peak of Lahilahi.

Off-shore and along the beach areas, it is possible that shorebirds, seals or turtles may be periodic visitors, however, none were observed during the site inspections. Therefore, other than the actual shoreline areas, the project site has no native wildlife value. Human use and feral cats and dogs make conditions unfavorable to any native wildlife.

Potential Impacts and Mitigative Measures

The improvements proposed for the Mauna Lahilahi Cultural Garden should not have a significant negative impact to migratory shorebirds or the introduced wildlife in the area. The introduced wildlife will most likely benefit from landscape improvements to the area. Since no proposed actions are planned in the marine environment there should be no significant negative impact to green sea turtles that may use the nearshore environment. Monk seals could appear along the coastline, and precautions should be taken to keep the public from disturbing the animal.

5.0 GENERAL DESCRIPTION OF THE ACTIONS TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL CHARACTERISTICS

5.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

An archaeological survey of Lahilahi was completed by the Public Archaeology Section, Bishop Museum (Komori 1987) for the previous landowner, Haggai Institute. The survey included the entire Lahilahi peninsula including the 5.4 acres proposed as the Mauna Lahilahi Cultural Garden (Figure 10). The full archaeology report is attached as Appendix A.

Existing Conditions

Little is known of the recorded history for Mauna Lahilahi. Vancouver was the first westerner to describe Mauna Lahilahi. In March of 1793, he described the area as "a high rock remarkable for its projecting from a sandy beach" and that at "a distance it appears to be detached from the land" (Vancouver 1978:217 in Komori 1987).

Archaeological studies in the project area were completed in 1986 (Kennedy) and 1987 (Komori, Bishop Museum). Fourteen of the 16 sites identified in the study area were believed to be associated with prehistoric type activity and are recommended to be preserved (Komori 1987). Two sites were associated with modern activities.

Only two of the sites which are recommended for preservation occur within the proposed cultural garden area. The sites are 1) a prehistoric/modern enclosure which may have been used for animals (Site 50-Oa-C4-310) and, 2) a stacked stone terrace and lithic scatter (Site 50-Oa-C4-308) at the base of the boulder strewn northeast slope of Mauna Lahilahi. The lithic scatter extends between Sites 308 and 310. Buffers of 6 feet to 10 feet around these sites are recommended by the archaeologist (Komori 1987).

The shoreline areas were not included in the Bishop Museum archaeological inventory survey. However, the study recommended that if the shoreline areas to the east and the west (including any sand dunes) are planned to be modified, construction would need to be monitored for any potential cultural deposits or human burials..

Potential Impacts and Mitigation Measures

The Mauna Lahilahi Cultural Garden master plan is designed to protect the known archaeological sites which will remain in-situ and will not be disturbed by the proposed park improvements.

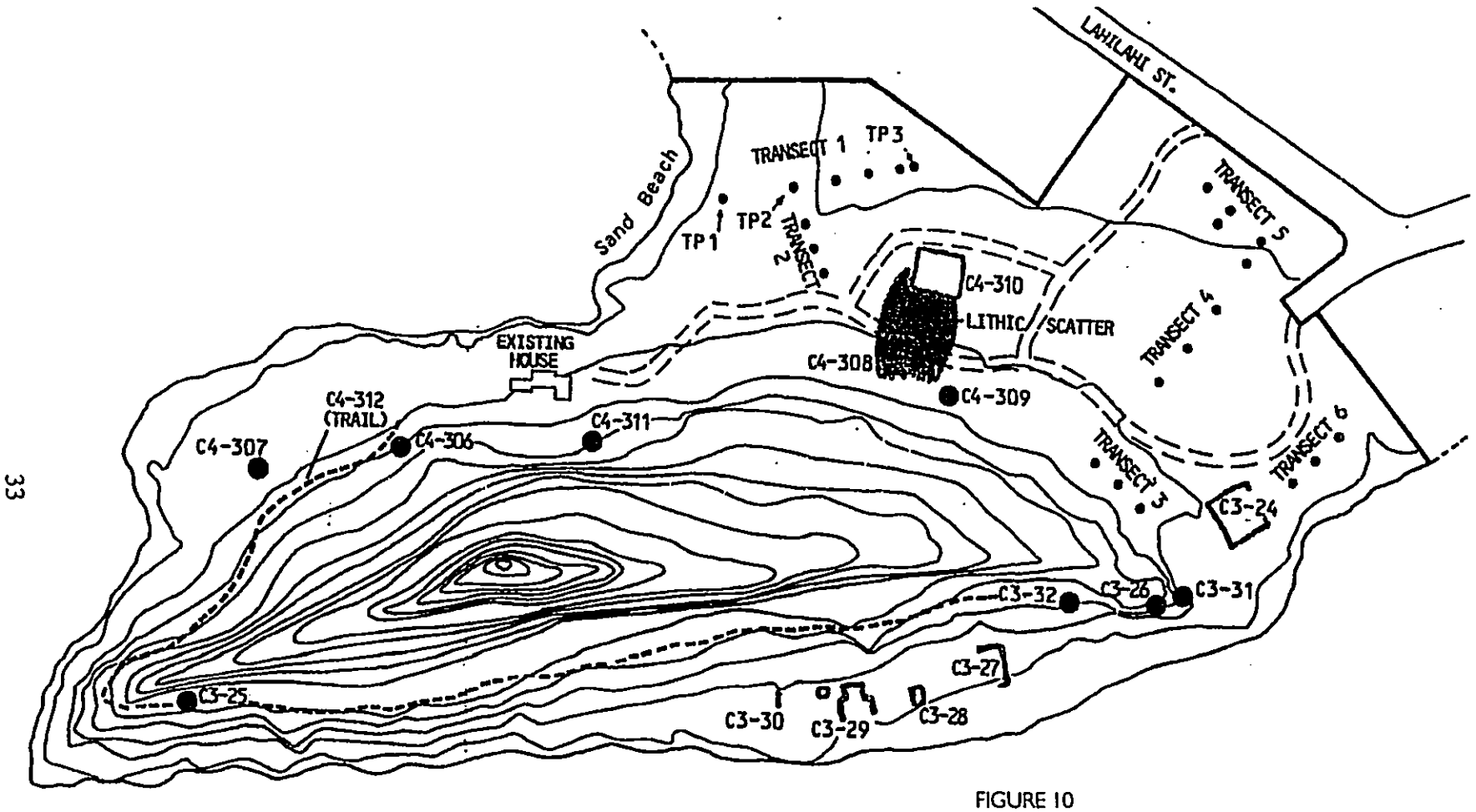


FIGURE 10
Archaeological Survey Site Map

Mauna Lahilahi
Cultural Garden

0 25 50
FEET

September 1999

PBR HAWAII

Source: Bishop Museum / Public Archaeology Section

The State Historic Preservation Division, in a letter dated March 5, 1998 (Appendix A-1) states that '[i]n general, the proposed improvements are to be built in areas that either have no historic sites present or in locales that were previously surveyed and found to be without significant historic sites (... Komori 1987). In view of these facts, we believe that the proposed undertakings will have "no effect" on significant historic sites'.

All construction plans will include the following language as recommended by the State Historic Preservation Division. "However, should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work shall cease immediately in the immediate vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division (telephone: 692-8015), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary."

5.2 ROADWAYS AND TRAFFIC

Existing Conditions

Farrington Highway is less than 200 yards away. Access to the project site is directly from Lahilahi Place or from Lahilahi Street. Lahilahi Street is an unsignalized street that connects to Farrington Highway and forms a loop with Lahilahi Place. Lahilahi Place and Lahilahi Street also provide access to approximately 17 single family residences along both streets. Lahilahi Place terminates at the entrance to the Cultural Garden which is secured by a locked gate (see Figures 2 and 11A). Current use of the park property is therefore sporadic.

An internal gravel roadway which goes to the former Waterhouse residence currently exists on the property and is not used due to the closed status of the park.

Potential Impacts and Mitigative Measures

The master plan concept for the Cultural Garden is premised on generational interaction through teaching and learning of Hawaiian cultural practices. This is anticipated through small groups of kupuna and students numbering 10 to 20 individuals. Hence, use of the improved facility is not designed for events that would draw large groups.

The master plan proposes opening an old entrance from Lahilahi Street into a new paved seven stall parking lot with a gravel overflow area for six additional cars. The existing "closed" gated entrance will be converted to a pedestrian gate open daily during daylight hours. Intermittent emergency vehicular access would be through the existing gravel roadway which leads to the former Waterhouse residence. The roadway will essentially serve as a pedestrian path within the property and be improved with an ADA acceptable surface.

The additional traffic at the intersection of Lahilahi Street and Farrington Highway which would be generated as a result of the project is expected to be minimal and would occur during non-peak periods. Therefore, no mitigative measures are necessary.

5.3 NOISE

Existing Conditions

The project site skirts a neighborhood of single and multi-family residences at the mauka boundary. The makai and side boundaries are along Mauna Lahilahi and the ocean. Traffic emanating from Lahilahi Street and Farrington Highway is the dominant noise source from mauka locations within the park. Nearer the east and west shorelines and the natural sound of waves are the dominant sounds. Occasional noise from aircraft may occur, but is not considered significant.

Potential Impacts and Mitigative Measures

Short-term noise impacts will be generated during construction. However, no significant noise impacts are expected to result from project development. The ultimate land uses planned may generate some degree of noise, but nothing greater than noise levels generally associated with passive park use.

5.4 AIR QUALITY

Existing Conditions

Present air quality at the park is excellent due to the trade winds from the ocean. Close to and along the neighborhood streets and the highway, the project area is mostly affected by air pollutants from vehicular sources. Emissions from motor vehicles on Farrington Highway, primarily nitrogen oxides and carbon monoxide, may be carried over portions of the beach park during kona winds.

The DOH monitors air quality at various locations on O'ahu. Typically, however, each station does not monitor the full complement of air quality parameters. The annual air quality measurements that were made nearest to the study area for each of the regulated air pollutants generally indicate that Ambient Air Quality Standards (AAQS), as defined by the DOH and Federal Environmental Protection Agency, have not been exceeded. It appears likely that the State AAQS for sulfur dioxide, nitrogen dioxide, and lead at the study area have not been exceeded. The ozone AAQS has not been exceeded during the past four years at the Sand Island monitoring station. Carbon monoxide readings from urban Honolulu, at the DOH Building station, indicate the State AAQS may be exceeded at a rate of one to three times per year, but only in traffic-congested areas. As such, the AAQS for carbon monoxide at the study area has probably not been exceeded.

Potential Impacts and Mitigative Measures

Future construction within the project area may produce short–and long-term air quality impacts. Short-term impacts will include fugitive dust and exhaust emissions produced by construction equipment and vehicles. Long-term impacts would result from additional usage of the park (increased barbeque usage, etc.). These impacts include increased vehicular exhaust, as well as indirect sources such as increased electrical power uses. However, because of the prevailing trade winds, these impacts are not expected to be significant.

All future construction activity on the project site will maintain strict compliance with State of Hawai'i Air Pollution Control regulations. A combination of measures such as watering exposed soils, minimizing the amount of disturbed area, and installation of wind screens would be implemented as appropriate. Impacts from exhaust emissions of construction vehicles will usually be mitigated by the effect of the winds, especially as most construction will not occur proximate to existing residential areas or other sensitive land uses.

5.5 VISUAL RESOURCES

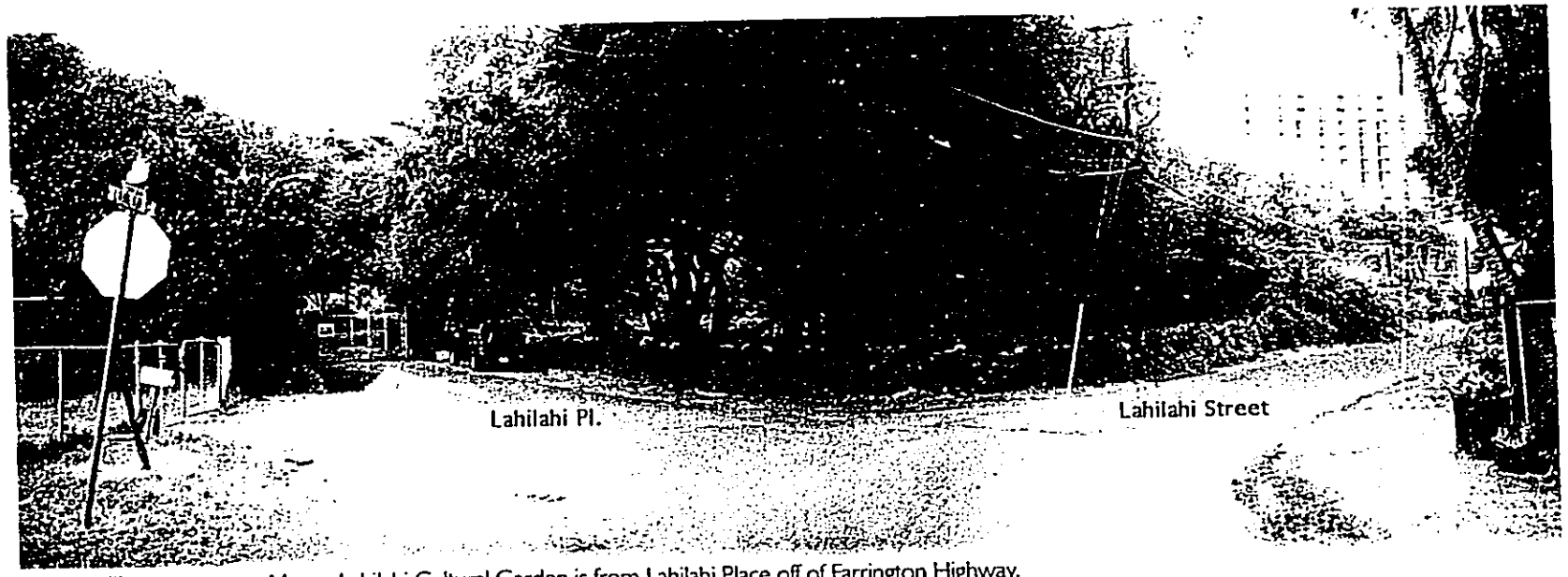
Existing Conditions

According to the City's *Coastal View Study* (Chu & Jones 1987), "the Wai'anae mountains with its descending ridges and other significant land forms jutting seaward along the coastline are the most dominant natural features of the Wai'anae area. These features are visible from most segments of Farrington Highway and all coastal parks. The integrity of such land forms and the condition of public open spaces are critical in determining the visual quality of the area."

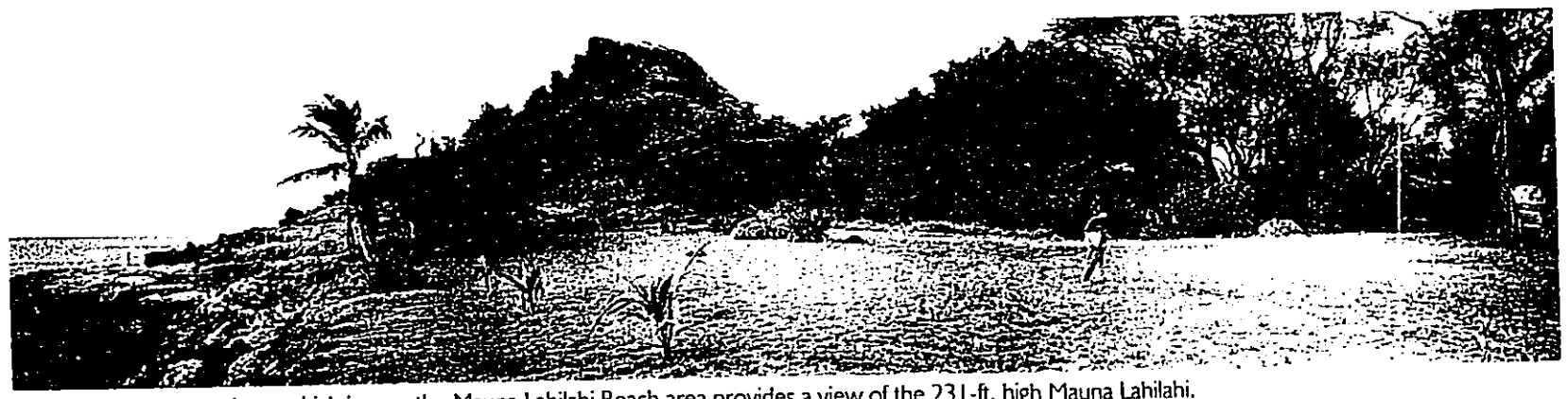
Mauna Lahilahi is within the Wai'anae Viewshed (from Kepuhi Point to the north to Mā'ili Point to the South) where coastal views occur in short and unrelated segments. Mauna Lahilahi is considered to be a prominent view object and coastal land form within the viewshed. Although it is not visible from the highway, views of Mauna Lahilahi are available from Wai'anae High School and the beach.

The *Coastal View Study* states, "Coastal views are severely impacted by mid-rise apartments adjacent to Mauna Lahilahi. The size and juxtaposition of such structures demonstrates poor planning/design sensitivity relative to Development Plan statements of urban design and its provisions for view protection of dominant landmarks. The visual encroachment at Lahilahi is particularly damaging, as it can be seen from the Wai'anae Viewshed."

Views from within the site. Coastline views can be experienced from the eastern and western shorelines within the beach park. But the dominant internal view is of the 231-foot high mountain which creates an intimate yet lush environment which is ideally suited to the proposed use. Views to the site are shown in Figures 11A to 11D.



1. The entrance to Mauna Lahilahi Cultural Garden is from Lahilahi Place off of Farrington Highway.



2. The western lawn which is near the Mauna Lahilahi Beach area provides a view of the 231-ft. high Mauna Lahilahi.

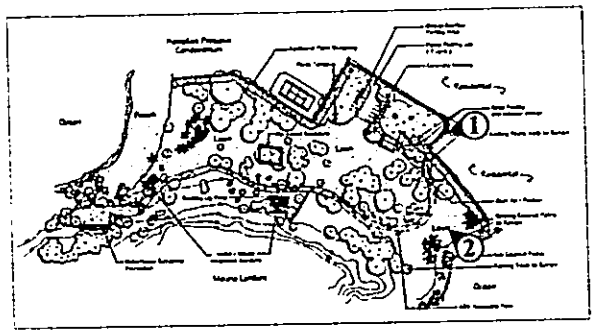
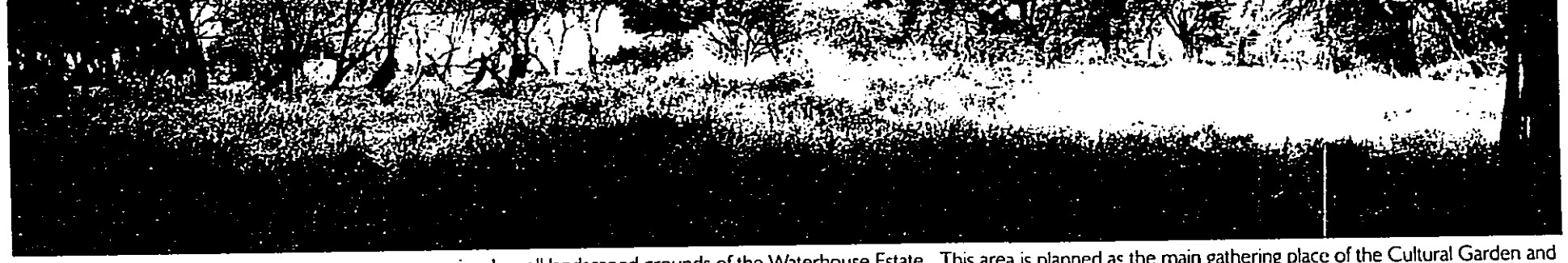


FIGURE 11 A
Site Photographs

Mauna Lahilahi
Cultural Garden

September 1999

PBR HAWAII



3. The central lawn, now overgrown, was previously well landscaped grounds of the Waterhouse Estate. This area is planned as the main gathering place of the Cultural Garden and will include the open air pavilion, comfort facilities and parking.

4. The remnants of the Waterhouse residence consist of this rock foundation which will remain intact in the improved park.

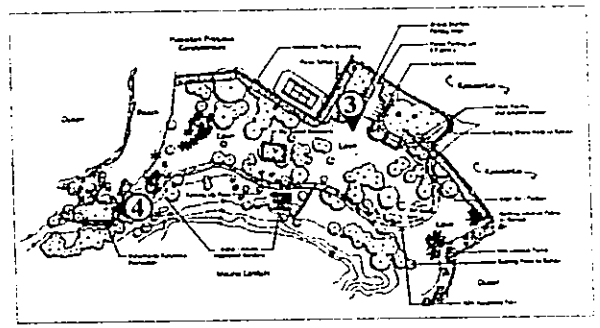


FIGURE 11 B
Site Photographs

Mauna Lahilahi
Cultural Garden

September 1999

PBR HAWAII

5. An existing gravel road leading to the Waterhouse site will be upgraded to an accessible material and maintained.

6. A landscape feature of the Waterhouse Estate includes a lily pond which will be cleaned and planted with native plant material.

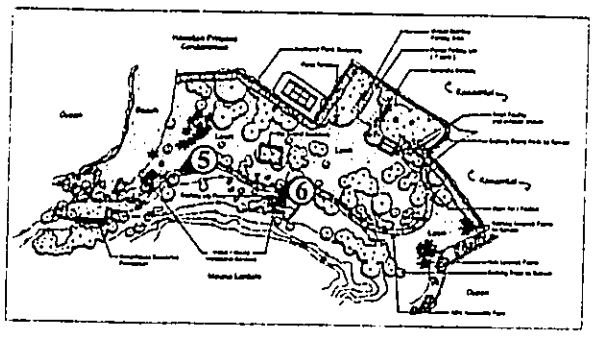
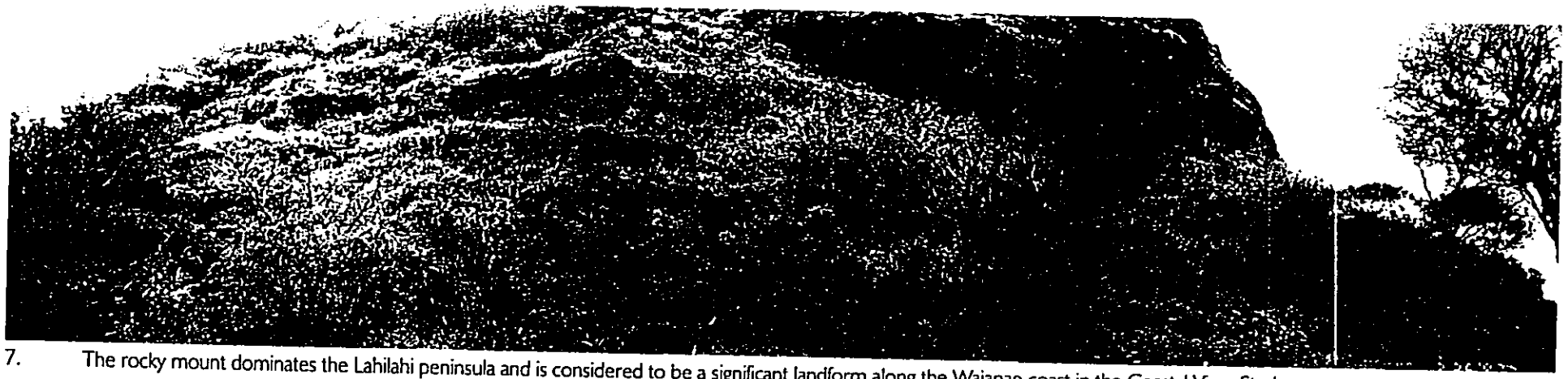


FIGURE 11 C
Site Photographs

Mauna Lahilahi
Cultural Garden



7. The rocky mount dominates the Lahilahi peninsula and is considered to be a significant landform along the Waianae coast in the Coastal View Study.

8. Lahilahi Point is not part of the park improvement area but will be accessible to the public through the Cultural Garden.

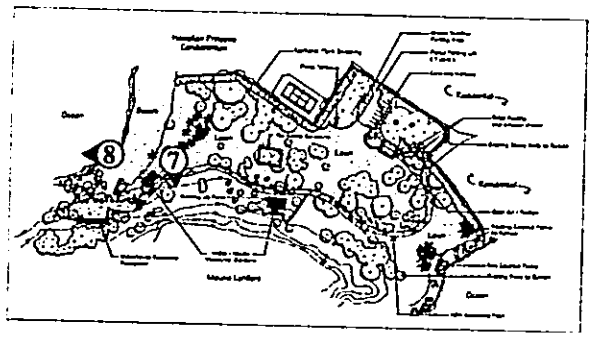


FIGURE 11 D
Site Photographs

Mauna Lahilahi
Cultural Garden

September 1999

PBR HAWAII

Potential Impacts and Mitigative Measures

The visual appearance of Lahilahi will positively change from the overgrown setting to a planned landscaped garden with new gardens and plantings. All existing larger trees in good health will be retained and new culturally significant trees and shrubs will be introduced. The master plan will include an open air pavilion which will be designed of modern materials to resist vandalism. The pavilion is planned with a traditional style thatch (or similar material) hip roof. The height of the pavilion will be approximately 15 feet. The existing trees which reach heights of approximately 40 feet will provide a visual buffer from the nearest roadways.

5.6 SOCIAL CHARACTERISTICS

5.6.1 Population

Existing Conditions

According to the 1990 Census, the population of the Wai'anae District was 37,411, an 18.8 percent increase over the population in 1980. The estimated population in 1995 was 37,966, a 1.5 percent increase over the 1990 population. In comparison, the County as a whole experienced a population growth of 9.7 percent between 1980 and 1990 and 4.1 percent from 1990 to 1995. Although recent growth in the Wai'anae area has slowed when compared to the overall growth on O'ahu the recreational infrastructure has remained unchanged. In addition, ethnically, the Wai'anae area has a higher concentration of native Hawaiians than other areas of O'ahu.

Potential Impacts and Mitigative Measures

The development of an improved park in the Wai'anae District will respond to the cultural recreational needs of the population, and especially the kupuna of the present and future generations. Mauna Lahilahi Cultural Garden is designed as a place which will embody Hawaiian ways, a gathering place for inter-generational teaching and learning of the indigenous traditions of the Hawaiian people. Such a venue has been long desired by the Wai'anae Coast communities.

5.7 ECONOMIC CHARACTERISTICS

Existing Conditions, Potential Impacts and Mitigative Measures

Employment, Personal Income and Expenditures. Presently, there are few Park Department administrative and maintenance jobs generated from the property. With the development of the proposed project, increased short-term direct and indirect employment during construction will be generated. After construction, no additional new positions would be required that can not be maintained by the department's existing staff. The improvements have been designed for minimal maintenance.

Economic Factors/Government Revenues. Direct income of construction workers is expected to be significant during the construction period and will stabilize after construction. Presently, no significant revenues to the City or State are generated from the study area, although the scenic and recreational resources of the park indirectly benefits tourism.

The development of the park improvements would not likely increase assessed land valuations in the region above those currently collected by the City.

5.8 INFRASTRUCTURE IMPROVEMENTS

5.8.1 Water Supply Facilities

Existing Conditions

The project area is currently serviced by the Board of Water Supply (BWS). Potable water is available from several on-site hose bibs, although most have slow leaks. A 3-inch potable line serves Lahilahi Street.

Potential Impacts and Mitigative Measures

The water system for the improved Mauna Lahilahi Cultural Garden will connect to the existing BWS system. Assuming that the irrigation demand for improved landscaped land area is approximately 6,500 gallons per day, the improved park is anticipated to have an average daily potable water demand of 7,000 gallons per day (MGD). The existing water line has the required capacity to accommodate construction of the new comfort station.

5.8.2 Wastewater Facilities

Existing Conditions

The Wai'anae area and the Lahilahi location is sewered by the City and County of Honolulu's wastewater system. A sewer main extends approximately fifty feet into the property off of Lahilahi Place.

Potential Impacts and Mitigative Measures

The proposed passive park is anticipated to be utilized by small groups of people and the restroom facility, which will be hooked up to the existing municipal system, is expected to be accommodated by the present available capacity.

5.8.3 Solid Waste Disposal Facilities

Existing Conditions

On O'ahu, residential and commercial wastes are hauled to landfills, the incinerator, or transfer stations. A waste-to-energy combuster, H-POWER (Honolulu Program of Waste Energy Recovery) located at the Campbell Industrial Park, began full commercial operation May 21, 1990. The facility is designed to process about 2,000 tons per day, and its gross generating capacity is 57 megawatts of electricity. About 1,800 tons per day are incinerated, producing between 100 and 400 tons of ash and non-processibles that are transported to Waimānalo Gulch Landfill and buried. The electricity generated is bought under a purchase power agreement with Hawaiian Electric Company. Currently, the H-POWER facility receives all the residential and commercial packer truck wastes on the island.

Waimānalo Gulch Landfill, which opened in 1989, is the City's primary solid waste disposal facility and is located mauka of Farrington Highway near Kahe Point. The site accepts residential, commercial, and nonhazardous industrial solid wastes, demolition debris, and ash and residue from the H-POWER waste-to-energy facility. Wastewater treatment sludge, septic tank wastes, and cesspool pumpings are accepted, provided such disposal is in accordance with the landfill's operating guidelines. The site handles special wastes such as spent lime, contaminated foods, and asbestos, all of which require special handling.

Potential Impacts and Mitigative Measures

The planned improvements to the park will comply with State Department of Health and the City and County of Honolulu Department of Facility Maintenance requirements to ensure that all aspects of the project conform to the program goals and objectives of the Integrated Solid Waste Management Act, Chapter 342G, Hawai'i Revised Statues, and the County's approved integrated solid waste management plans in accordance with a schedule and time frame satisfactory to the Department of Health. Efforts will be made to convert greenwaste to compost during the clearing of the property.

5.8.4 Drainage Facilities

There are no on-site drainage facilities. A 30-inch drain outlet is located just off the property at the intersection of Lahilahi Street and Lahilahi Place, but this drain backs up with any substantial rainfall. This drain's outlet is the nearby ocean, and local residents report that the outlet is filled with rocks and is barely above the median tide level.

No additional drainage improvements will be required to control surface flows due to the park improvements. However, the site design for the proposed park improvements will take into consideration existing drainage features.

5.8.5 Electrical/Communications

Electricity for the surrounding areas is currently being provided by Hawaiian Electric Company (HECO). HECO owns and maintains a pole line along Farrington Highway. There is no electrical power on-site.

No expansion of the existing services is required for the planned park improvements. Based on availability of present service capabilities and planned improvements in the electrical facilities, significant impacts are not expected to result from the proposed action. Likewise the proposed action should produce no significant impacts to telephone service.

5.9 PUBLIC SERVICES

5.9.1 Public Schools

Existing Conditions

At present, several public schools service the Wai'anae District: Mā'ili Elementary School, Nānāikapono Elementary, Nānākuli Elementary, and Wai'anae Intermediate and High Schools.

Potential Impacts and Mitigative Measures

The improvements will not affect school enrollment in the Wai'anae District and therefore no mitigative measures are necessary. However, the planned development of Lahilahi as a cultural garden park will enhance the non-institutional educational opportunities for youth in the Wai'anae area and provide a venue for learning from kupuna in the community.

5.9.2 Health Care Facilities

Existing Facilities

Public health care in the Wai'anae District is provided by the Wai'anae Coast Comprehensive Health Care Center, located several miles south of the project site. Additionally, ambulance service is available from the Wai'anae Fire Station, approximately 1.5 miles from Mauna Lahilahi.

St. Francis Medical Center-West is the nearest hospital facility to the study area. Ambulance service is coordinated with the City and County and the hospital has a helipad. The medical center offers general hospital services including emergency care, outpatient care, lab and imaging services, and medical offices.

Additional, nearby emergency medical and surgical services can also be provided by Pali Momi Medical Center in Aiea. Non-emergency medical services are offered at Kaiser Permanente's Pūnāwai Clinic in Waipahu. In addition, medical services can be obtained at major hospital facilities in urban Honolulu, a 40-minute drive from the study area.

Potential Impacts and Mitigative Measures

The development of the Cultural Garden passive park would be used by small numbers of people at a time which may slightly impact the levels of service provided by either the Wai'anae Coast Comprehensive Health Care Center or fire department ambulance service. It appears that both services are adequately staffed to handle any increased emergency needs.

5.10 POLICE AND FIRE PROTECTION

Existing Conditions

Police Protection. Police protection services are located in Wai'anae town, approximately 1.5 miles from Lahilahi.

The study area falls within the Police Department's District 3, which encompasses approximately 204 square miles from Ka'ena Point to Red Hill. There are about 200 field officers assigned to the entire district. Response time for the entire district is between five to seven minutes. The services include a police substation. Existing and planned police services and facilities are considered adequate for the present condition.

Fire Protection. Fire protection services are located in Wai'anae town, approximately 1.5 miles southeast of Lahilahi. The services include a fire station with one fire truck and one tanker truck. Another fire station, with the same capabilities as the Wai'anae Station, is located in Nānākuli, southeast of the project site. In addition, the Campbell Industrial Park Fire Station would provide back up. This station will provide an additional engine and ladder company with 13 on-duty personnel.

Probable Impacts and Mitigative Measures

The park improvements may increase usage of the shoreline at this location and may require increased water safety personnel, however, the expected impact to either department is not anticipated to be significant. Existing fire protection services and facilities are considered adequate for the present condition.

5.11 RECREATIONAL FACILITIES

Existing Conditions

In addition to the subject Mauna Lahilahi Cultural Garden park, recreational facilities in the Wai'anae area are designated as district parks, regional parks, community parks, neighborhood parks, and beach/shoreline parks. District and regional parks are large recreational complexes. Community parks serve an approximate population of 10,000 people and normally include playfields, courts, and a recreation building. Neighborhood parks serve an approximate population

of 5,000 people and normally include playfields, courts, and a comfort station. Beach/shoreline parks are day use parks primarily for swimming, sunbathing, and picnicking.

The existing parks in the Wai'anae area are shown in the following table:

Existing Parks in the Wai'anae Area

Name	Type	Size (acres)
Kahe Point Beach Park	beach	4.470
Kea'au Beach Park	beach	38.047
Lualualei Beach Park	beach	17.750
Mā'ili Beach Park	beach	39.563
Mākaha Beach Park	beach	20.620
Nānākuli Beach Park	beach	39.626
Pōka'ī Bay Beach Park	beach	15.487
Tracks Beach Park	beach	14.297
Ulehawa Beach Park	beach	57.645
Wai'anae District Park	district	22.920
Wai'anae Regional Park	regional	19.500
Mā'ili Community Park	community	3.683
Mākaha Community Park	community	4.319
Pililā'au Community Park	community	10.437
Kaupuni Neighborhood Park	neighborhood	7.505

Potential Impacts and Mitigative Measures

The proposed project is expected to enhance the overall opportunity for cultural recreational facilities in the Wai'anae District and achieve the stated goals for the project. The proposed improvements at Mauna Lahilahi Cultural Garden will address a portion of the demand for cultural recreational facilities. Although the park land area is not being expanded, the facility improvements will increase the capacity of the park making it available to more users.

6.0 DETERMINATION, FINDINGS AND REASONS FOR SUPPORTING DETERMINATION

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

6.1 SIGNIFICANCE CRITERIA

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

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;

An archaeological inventory survey of Mauna Lahilahi by Bishop Museum (Komori 1987) was completed for the previous landowner, the Haggai Institute. Within the 5.4 area designated for the cultural garden, there are two sites which are considered to be significant.

The sites are 1) a prehistoric/modern enclosure which may have been used for animals (Site 50-Oa-C4-310) and, 2) a stacked stone terrace and lithic scatter (Site 50-Oa-C4-308) at the base of the boulder strewn northeast slope of Mauna Lahilahi. The lithic scatter extends between Sites 308 and 310. Buffers of 6 feet to 10 feet around these sites are recommended by the archaeologist.

The shoreline areas were not included in the Bishop Museum archaeological inventory survey. Therefore the study recommended that the shoreline areas to the east and the west (including any sand dunes) be monitored if any construction (including landscaping) is planned in those areas.

The Mauna Lahilahi Cultural Garden is a low-impact project. All cultural deposits will remain in-situ in perpetuity and will not be disturbed by the proposed park improvements.

The State Historic Preservation Division, in a letter dated March 5, 1998 (Appendix A-1) states that '[i]n general, the proposed improvements are to be built in areas that either have no historic sites present or in locales that were previously surveyed and found to be without significant historic sites (... Komori 1987). In view of these facts, we believe that the proposed undertakings will have "no effect" on significant historic sites'.

All construction plans will include the following language as recommended by the State Historic Preservation Division. "However, should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work shall cease immediately in the immediate vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division (692-8015), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary."

In the event that any cultural deposits or human burials are uncovered in the sandy areas, all work will immediately be halted and planting plans will be modified to avoid any sensitive areas.

The proposed project will not impact scenic views or any ridgelines from Farrington Highway or other heavily traveled roadways in the area. The visual character of the area will be enhanced by the additional landscaping with native trees and other coastal native plantings. The landscape plantings will also mitigate existing soil erosion.

(2) Curtails the range of beneficial uses of the environment;

The property, through the development of the Mauna Lahilahi Cultural Garden, will allow the residents of Hawai'i to use the site for passive recreational uses which are currently curtailed by the "closed" status of the park. Hence, the improvement as described in the master plan will enhance the range of beneficial uses of the environment.

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

The proposed development is consistent with the Environmental Policies established in Chapter 344, HRS.

(4) Substantially affects the economic or social welfare of the community or state;

The proposed project will provide a significant contribution to the Wai'anae Coast population by establishing an improved cultural recreational resource. Surrounding land use patterns will not be negatively or significantly altered, nor will unplanned population growth or its distribution be stimulated.

Consequently, development of the park improvements will provide Mākaha and Wai'anae coast residents with a quality cultural recreational facility. This harmonious relationship between the park and the existing community will significantly improve the quality of life for many residents including the community's elders and youth who will benefit from the teachings of the kupuna.

(5) Substantially affects public health;

Although the public health may be affected by the short-term construction impacts which may affect air, noise, traffic and water quality, these should not be significant especially when weighed against the positive economic, social, and quality of life implications associated with the project. Mitigation measures will be used to address impacts that could potentially affect public health.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities;

The improvements to Lahilahi will not have any secondary impact associated with population growth or the need for public facilities.

(7) Involves a substantial degradation of environmental quality;

The renovation of this currently under-utilized resource will improve a much needed natural resource. There are no anticipated impacts that would degrade environmental quality. The addition of new landscaping with native plants will enhance the park environment by providing new natural plant materials and medicinal plants.

(8) Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

The master planned improvements are consistent with the existing and planned urban character expressed in the State Land Use map and are not anticipated to have a considerable effect on the environment. The commitment of fiscal resources to construct the improvements at the property will foreclose other uses of those resources.

(9) Substantially affects a rare, threatened or endangered species or its habitat;

Field wildlife and botanical assessments indicate that there are no endangered plant or animal species located at this park. The federal and state natural resource agencies have not identified the Lahilahi shoreline as a site for monk seals or turtle nesting, however, it is possible that seals may beach there from time to time.

(10) Detrimentally affects air or water quality or ambient noise levels;

Any possible impact to near-shore ecosystems resulting from surface runoff will be mitigated by the establishment of on-site detention basins during the construction phases of development.

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

The low-lying areas of Mauna Lahilahi, like all other coastal parks in the State are susceptible to high wave and tsunami inundation. All improvements will be located on areas which are not designated as flood zones.

(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies;

The City and County of Honolulu's *Coastal View Study* identifies Mauna Lahilahi (within the Wai'anae Viewshed) as a prominent coastal land form.

Lateral coastal views which are available from all points along the shoreline are significant, especially in the Ka'ena direction due to the descending ridges which can be seen in the distance. Although new landscape plantings may impact views, the overall visual resource will be enhanced.

(13) Requires substantial energy consumption;

The location of the proposed project in Mākaha is proximate to other Wai'anae Coast communities which are all within short driving distances from the property, thereby reducing travel times and energy consumption. Construction and operation of the proposed project will not require substantial energy consumption.

6.2 DETERMINATION

On the basis of the above criteria, and the discussion of impacts and mitigative measures contained in this document, it is anticipated that the proposed project will not have a significant negative effect on the environment and will conversely, result in positive effects to the natural, cultural, and social environments.

7.0 COMMENTS AND RESPONSES

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

7.1 COMMENTS RECEIVED ON THE DRAFT EA

State of Hawai'i

Department of Land and Natural Resources
Department of Land and Natural Resources – Historic Preservation Division

City and County of Honolulu

Board of Water Supply
Department of Environmental Services
Department of Facility Maintenance
Department of Parks and Recreation
Department of Planning and Permitting

Community

Waianae Coast Neighborhood Board No. 24

7.2 DRAFT EA COMMENT LETTERS AND THE APPLICANT'S RESPONSES

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621
HONOLULU, HAWAII 96809

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

JUN 22 1999

Ref:PS:EH

Mr. Randall K. Fujiki, Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 9th Floor
Honolulu, Hawaii 96813

Dear. Mr. Fujiki:

Subject: Draft Environmental Assessment (DEA)
Mauna Lahilahi Cultural Garden
TMK: 8-4-01:08

We have reviewed the subject DEA document and offer the following comments for your consideration.

Engineering Branch:

Please see attached comments.

Thank you for the opportunity to review the proposed project.

Should you have any questions, or require further assistance, please contact staff planner Ed Henry at (808) 587-0380.

Very truly yours,

TIMOTHY E. JOHNS
Chairperson

Attachment

JUN 23 1999

ENGINEERING BRANCH

COMMENTS

We recommend that the proposed developments located in the flood zone be designed in accordance with Section 7.10-4 Development Standards and Section 7.10-7 Coastal High Hazard District, Article 7 Special District Regulations of the City and County of Honolulu Land Use Ordinance, latest edition.

The Lahilahi shoreline and park is not located entirely in Zone X. The western portion of the site is located in Zone X. This is an area determined to be outside the 500-year flood plain.

The eastern portion of the proposed project site is located in Zone AE. Zone AE is an area located within the 100-year flood plain with base flood elevations determined. The remainder of the site is located in Zone VE. This is an area within the 100-year flood plain with coastal flooding with velocity hazard (wave action), and base flood elevations determined.

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

Mr. Timothy E. Johns, Chairperson
Department of Land and Natural Resources
State of Hawaii
Post Office Box 621
Honolulu, Hawaii 96809

Dear Mr. Johns:

Subject: Response to Comments on the Mauna Lahilahi Cultural Garden
Draft Environmental Assessment (DEA)
Tax Map Key 8-4-01:08 (Por.), Makaha, Oahu, Hawaii

We have reviewed your letter dated June 22, 1999 regarding the DEA for the Mauna Lahilahi Cultural Garden and offer the following response to your comments.

The final EA will note the various flood zones as designated on the FIRM, including Zones AE and VE.

Thank you for participating in the environmental review process.

Sincerely,

RANDALL K. FUJIKI
Director

RKF:ei

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JANET E. KAWELO

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

May 27, 1999

Mr. Randall K. Fujiki
Director
Department of Design and Construction
City and County of Honolulu
650 S. King Street, 9th Floor
Honolulu, Hawaii 96813

3 1999

LOG NO: 23483
DOC NO: 9905EJ23

Dear Mr. Fujiki:

SUBJECT: **Chapter 6E-8 Historic Preservation Review -- Draft Environmental Assessment (DEA)**
Mauna Lahilahi Cultural Garden
Makaha, Wai'anae, O'ahu
TMK: 8-4-001:008 & 009;8-4-004:005 & 009

Thank you for the opportunity to review the DEA for the Mauna Lahilahi Cultural Garden. We commented in March 1998 on the City and County of Honolulu's proposed improvements which have been incorporated into the DEA. Our earlier correspondence, which stated that we believe that the proposed undertaking will have "no effect" on significant historic sites, is included in Appendix A-1. Section 5.1 of the DEA also includes our comments that construction plans are to include the following note:

> Should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work shall cease immediately in the immediate vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact he State Historic Preservation Division at 692-8015 which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary.

Therefore we believe that the actions proposed in this DEA will have "no effect" on significant historic sites.

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

Aloha,

Don Hibbard, Administrator
State Historic Preservation Division

EJ:jk

c: Office of Environmental Quality Control, 235 S. Beretania Street, Suite 702, Honolulu, HI 96813
Mr. Donald Griffin, Department of Design and Construction, City and County of Honolulu, 650 S. King Street, 9th Floor, Honolulu, HI 96813
Ms. Yukie Ohashi, PBR Hawaii, Pacific Tower, Suite 650, 1001 Bishop Street, Honolulu, HI 96813

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

Mr. Don Hibbard, Administrator
Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

Subject: Response to Comments on the Mauna Lahilahi Cultural Garden
Draft Environmental Assessment (DEA)
Tax Map Key 8-4-01:08 (Por.), Makaha, Oahu, Hawaii

We have reviewed your letter dated May 27, 1999 regarding the DEA for the Mauna Lahilahi Cultural Garden. We acknowledge your assessment that the proposed undertaking will have no effect on significant historic sites.

Thank you for participating in the environmental review process.

Sincerely,

for RANDALL K. FUJIKI
Director

RKF:ei

BOARD OF WATER SUPPLY

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

JEREMY HARRIS, Mayor

EDDIE FLORES, JR., Chairman
FORREST C. MURPHY, Vice Chairman
JAN M.L.Y. AMII
ROSS S. SASAMURA, P.E.
BARBARA KIM STANTON
CHARLES A. STED

KAZU HAYASHIDA, Ex-Officio

CLIFFORD S. JAMILE
Manager and Chief Engineer

June 15, 1999

TO: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

FROM: CLIFFORD S. JAMILE

SUBJECT: PBR HAWAII'S TRANSMITTAL OF MAY 17, 1999 REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MAUNA LAHILAHI CULTURAL GARDEN, WAIANAE, OAHU, HAWAII, TMK: 8-4-01: 08 (PORTION)

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the proposed Mauna Lahilahi cultural garden project:

We have the following comments to offer:

1. The existing water system is presently adequate to accommodate the proposed development.

2. There is an existing 1½-inch water meter, Premise ID 1091652, serving the project site.

3. The availability of water will be confirmed when the building permit application is submitted for our review and approval. When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

4. If a three-inch or larger meter is required, the construction drawings showing the installation of the water meter should be submitted for our review and approval.

5. The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

6. The proposed project will be subject to Board of Water Supply cross-connection requirements prior to the issuance of the building permit application.

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

cc: Office of Environmental Quality Control, State of Hawaii
Yukie Ohashi, PBR Hawaii

JUN 23 1999

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

TO: CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: for RANDALL K. FUJIKI, DIRECTOR

SUBJECT: RESPONSE TO COMMENTS ON THE MAUNA LAHILAHI CULTURAL GARDEN DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
TAX MAP KEY 8-4-001:008 (POR.), MAKAHA, OAHU, HAWAII

We have reviewed your letter dated June 15, 1999 regarding the DEA for the Mauna Lahilahi Cultural Garden and offer the following responses to your comments:

1. We acknowledge that the existing water system is presently adequate to accommodate the proposed development.

2. We acknowledge that there is an existing 1½-inch water meter, Premise ID 1091652, serving the project site.

3. The building permit application will be submitted to the Board for your review and approval. The Department of Parks and Recreation will comply with the applicable water system facilities charges for resource development, transmission, and daily storage.

4. Should a 3-inch or larger meter is required, construction drawings showing the installation of the water meter will be submitted for your review and approval.

5. Requirements concerning on-site fire protection will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

6. We acknowledge that the proposed project will be subject to the Board of Water Supply's cross-connection requirements prior to the issuance of the building permit application.

Thank you for participating in the environmental review process.

RKF:ei

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

JUN 16 1999

JEREMY HARRIS
Mayor

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

BARRY FUKUNAGA
Deputy Director

ENV 99-67

JUN 15 1999

Mr. Yukie Y. Ohashi
Project Manager
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Ohashi:

Subject: Draft Environmental Assessment (DEA)
Mauna Lahilahi Culture Garden
TMK: 8-4-01: Por.08

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

1. During construction, best management practices (BMPs) should be employed to reduce and control discharge of pollutants.

2. If possible, divert storm runoff from the parking lot to landscaped area or water quality inlets.

3. Please change the City agencies' names wherever applicable to reflect recent City reorganization effort.

4. Please contact the Wastewater Branch, Site Development Division, Department of Planning and Permitting for sewer capacity adequacy.

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

Sincerely,

KENNETH E. SPRAGUE
Director

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

TO: KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL SERVICES

FROM: RANDALL K. FUJIKI, DIRECTOR

SUBJECT: RESPONSE TO COMMENTS ON THE MAUNA LAHILAHI CULTURAL GARDEN DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
TAX MAP KEY 8-4-001:008 (POR.), MAKAHA, OAHU, HAWAII

We have reviewed your letter dated June 15, 1999 regarding the DEA for the Mauna Lahilahi Cultural Garden. We offer the following responses:

1. Best management practices will be specified on construction plans and will be employed during construction to reduce and control discharge of pollutants.

2. The site design for the proposed park improvements will consider diverting storm runoff from the parking lot to landscaped areas or water quality inlets.

3. Applicable changes of City agencies' names have been made in the final EA to reflect the recent City reorganization effort.

4. The Wastewater Branch, Site Development Division, of the Department of Planning and Permitting will be contacted for sewer capacity adequacy.

Thank you for participating in the environmental review process.

RKF:ei

99-0559-
Laverne

PBR HAWAII

LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

RECEIVED
DEPARTMENT OF
FACIL... MAINTENANCE
MAY 18 1 30 PM '99

COPY

'99 MAY 25 A8:47

May 17, 1999

Dear Participant:

Attached for your review is a Draft Environmental Assessment (EA) which was prepared pursuant to the EIS Law (Hawaii Revised Statutes, Chapter 343) and the EIS rules (Administrative Rules, Title 11, Chapter 200).

Title of Project: Mauna Lahilahi Cultural Garden

Location: **Island:** Oahu **District:** Waianae

Tax Map Keys: 8-4-01:08

Agency Action: X **Applicant Action:** ___

Your comments must be received or postmarked by June 22, 1999.

Please address your comments to Mr. Randall K. Fujiki, Director, **Department of Design and Construction.**

Applicant: To: Department of Design and Construction
City and County of Honolulu
650 South King Street, 9th Floor
Honolulu, Hawaii 96813

May 18, 1999
We do not have any comments.
If you have any questions,
please call Laverne Higa
at 527-6246.

Copies of your comments should be sent to OEQC and the following:

Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813

From: Ross S. Sasamura
Acting Director and Chief Engineer
Department of Facility Maintenance

Approving Agency or Accepting Authority: Department of Design and Construction
City and County of Honolulu
650 S. King Street, 9h Floor
Honolulu, Hawaii 96813

Contact: Mr. Donald Griffin **Phone:** 527-6324

Consultant: PBR Hawaii
Pacific Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813

Contact: Ms. Yukie Ohashi **Phone:** 521-5631

If you no longer need this EA, please return it to PBR Hawaii. Thank you for participating in this review process.

W. Frank Brandt • Thomas S. Witten • R. Stan Duncan • Russell Y. J. Chung

HONOLULU OFFICE
1001 BISHOP STREET, PACIFIC TOWER, SUITE 650, HONOLULU, HAWAII 96813
TELEPHONE: (808) 521-5631 FAX: (808) 523-1402 E-MAIL: pbrhi@aloha.net

WAILUKU OFFICE
2123 KAOHU STREET, WAILUKU, HAWAII 96793-2204
TELEPHONE: (808) 242-2878 FAX: (808) 242-2902

HILO OFFICE
101 AUPUNI STREET, HILO LAGOON CENTER, SUITE 310, HILO, HAWAII 96720-4276
TELEPHONE: (808) 961-3333 FAX: (808) 961-4989

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

TO: ROSS S. SASAMURA, DIRECTOR
DEPARTMENT OF FACILITY MAINTENANCE

FROM: for RANDALL K. FUJIKI, DIRECTOR

SUBJECT: RESPONSE TO COMMENTS ON THE MAUNA LAHILAHI CULTURAL GARDEN DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
TAX MAP KEY 8-4-001:008 (POR.), MAKAHA, OAHU, HAWAII

We have reviewed your statement of May 18, 1999 regarding the DEA for Mauna Lahilahi Cultural Garden.

We acknowledge that you do not have any comments.

RKF:ei

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 10TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4182 • FAX: (808) 523-4054

JEREMY HARRIS
MAYOR

WILLIAM D. BALFOUR, JR.
DIRECTOR

MICHAEL T. AMII
DEPUTY DIRECTOR

23

June 18, 1999

TO: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

FROM: WILLIAM D. BALFOUR, JR., DIRECTOR

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (EA)
MAUNA LAHILAHI CULTURAL GARDEN

We have reviewed the above-referenced document and have no comments at this time.

Thank you for the opportunity to review the draft EA.

Should you need further information, please contact Mr. Donald Kusunoki, Windward Oahu District Manager, at 671-0561.

W. D. Balfour Jr.

WILLIAM D. BALFOUR, JR.
Director

WDB:cu
(99-1220GT)

cc: Office of Environmental Quality Control
Ms. Yukie Ohashi, PBR Hawaii

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

TO: WILLIAM D. BALFOUR, JR., DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

FROM: RANDALL K. FUJIKI, DIRECTOR

SUBJECT: RESPONSE TO COMMENTS ON THE MAUNA LAHILAHI CULTURAL GARDEN DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
TAX MAP KEY (1) 8-4-001:008 (POR.), MAKAHA, OAHU, HAWAII

We have reviewed your comments dated June 18, 1999 regarding the DEA for the Mauna Lahilahi Cultural Garden. We note that your agency has no comments regarding the project at this time.

Thank you for participating in the environmental review process.

RKF:ei

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

23

June 22, 1999

1999/CLOG-3309(ASK)
`99 EA Comments Zone 8

MEMORANDUM

TO: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

FROM: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR MAUNA LAHILAHI CULTURAL GARDEN

We have reviewed the above-referenced document and offer the following comments:

Land Use Regulations and Policies

1. The final EA should include a discussion of all applicable City and County of Honolulu Development and General Plan's objectives and policies.

2. Current Development Plan.

   a. The proposed Mauna Lahilahi Cultural Garden is designated Residential on the existing Waianae Development Plan Urban Land Use Map.

   b. Prior to the appropriation of construction funds, the proposed cultural garden must be identified on the Waianae Development Plan Public Facilities Map.

3. Proposed Development Plan.

   a. The Department of Planning and Permitting is in the process of revising the City's development plans. The preliminary draft of the revised Waianae Sustainable Communities (Development) Plan recommends that the proposed project site area be included within the Rural Community Boundary. The proposed park is consistent with the open space element of the plan. Open space in the area is essential to preserving the rural character of Waianae.

The proposed project is also consistent with the plan proposal to create and preserve areas makai of Farrington Highway (Coastal Lands) for open space, beach parks, and public access.

b. The proposed cultural garden is also consistent with the proposed plan policy to protect historic and cultural resources.

4. The project is within the Special Management Area. A Special Management Area Use Permit (SMP) must be obtained prior to implementing the project. Application instructions are enclosed. You should also be aware that the parcel is subject to a 40-foot shoreline setback.

The SMP application should describe:

- recreational use of the coastline and near shore waters;
- public beach access in the vicinity of the project and at the project site;
- wildlife that may use the site intermittently. We suggest that the U.S. Fish and Wildlife Service be contacted;
- the proposed structures and provide elevation drawings;
- the volume of additional wastewater that will be generated. Is the existing infrastructure and treatment plant capacity sufficient to accommodate the added flows?
- the volume of solid waste that will be generated and how and where the waste will be disposed;
- the disposal of rinse water from the proposed outdoor shower; and
- existing and future drainage patterns and volumes.

<u>Miscellaneous</u>

5. Page 2, Section 1.3 of the disclosure document should be amended to clarify that the Department of Design and Construction is the accepting authority for the environmental documents as is indicated on the transmittal sheet and page 1 of the Draft EA.

6. We recommend that the Neighborhood Board be provided with a copy of the Draft EA.

7. Pages 4 and 20 refer to a project area of 5.4 acres, the entire area for the parcel identified by Tax Map Key 8-4-1: 8. Elsewhere, the Draft EA indicates that only a portion of parcel 8 will be developed as the cultural garden. The final EA should clearly identify the project area.

8. A drainage report may be required when the construction plans are submitted for approval.

9. Page 2, Section 1.4: The Department of Public Works and Wastewater Management no longer exist. Please revise accordingly.

10. Page 7, Section 2.5: "Lahilhi" should read "Lahilahi".

11. Page 24, Section 4.4.2: "contribute" should read "contribution".

12. Page 39, Section 5.8.3: The Department of Public Works no longer exists. Should this be changed to the Department of Environmental Services?

Usage and Site Plan

13. Page 38 indicates that the park will be used by "small groups". Only seven paved parking stalls are planned. Given the high demand for beach park space on Oahu, the final EA should explain why the park will not be used by many and whether the proposed parking will be sufficient.

14. According to Figure 3, the shower is 280 feet from the beach. If the shower is intended to serve beach users, consideration should be given to locating the shower closer to the beach. Although not discussed, Figure 3 seems to indicate a sandy beach located on the Makaha side of the site. If beach activities are expected to be concentrated in this area, perhaps the shower should be located closer to this side of the park.

15. The master plan may wish to consider permanent informational exhibits on the archaeology and flora of the area.

Visual impacts

16. The final EA should disclose if the proposed structures will be visible from public viewing areas and what effect this has on the rural character of the view.

17. The final EA should indicate what is meant by the "traditional style" of the proposed open air pavilion. An elevation drawing would help to illustrate the design character.

Flood

18. The flood information on page 21 should be changed to indicate that portions of the project site are in the AE or VE flood hazard zones as shown in Figure 8.

Traffic

19. The following design considerations should be incorporated into the construction plans for this project prior to applying for a building permit application:

    - The pavement width of the roadway leading to the site, which we understand will be from an extension of Lahilahi Place and also identified as a City street, should be wide enough to accommodate two-way traffic. A pavement width of 20 feet should be sufficient.

    - The signing and striping at the intersection of Lahilahi Place and Lahilahi Street, with regard to the "STOP" controls, appear to be faded and may need to be better defined with the increased usage of this roadway. The designer should work with our department prior to submitting construction plans to determine the extent of work that needs to be done.

20. Construction plans for all work within the public right-of-way should be submitted for review.

Thank you for the opportunity to comment. Should you have any questions, please contact Ardis Shaw-Kim of our Coastal Lands Branch at 527-5349.

Very truly yours,

for JAN NAOE SULLIVAN
Director of Planning
and Permitting

JNS:am
Encls.
cc: Office of Environmental Quality Control
Yukie Ohashi, PBR Hawaii

posse doc no. 5213

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

TO: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: for RANDALL K. FUJIKI, DIRECTOR

SUBJECT: RESPONSE TO COMMENTS ON THE MAUNA LAHILAHI CULTURAL GARDEN DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
TAX MAP KEY 8-4-01: 08, MAKAHA, OAHU, HAWAII

We have reviewed your comments of June 22, 1999 regarding the DEA for Mauna Lahilahi Cultural Garden. We offer the following responses to each of your comments:

Land Use Regulations and Policies

1. The final EA has been revised to include discussion of applicable City and County of Honolulu Development and General Plan objectives and policies.

2. *Current Development Plan.* Appropriate steps will be taken to include the proposed cultural garden on the Waianae Development Plan Public Facilities Map.

3. *Proposed Development Plan.* The design concept for the cultural garden is the result of an extensive community planning process. The low profile garden design with minimal structures will preserve the makai areas, protect historic and cultural resources, and safeguard the public views of the Lahilahi mount. This concept is consistent with the open space element of the Rural Community Boundary.

4. A Special Management Area Use Permit application will be prepared and submitted prior to implementation of the project.

Miscellaneous

5. The final EA has been corrected and identifies the Department of Design and Construction as the approving agency of the EA.

6. The Waianae Coast Neighborhood Board has reviewed the draft EA. Their comments are included in the final EA.

7. Total project area. The total project area is 5.4 acres of a larger parcel. This has been clarified in the final EA.

8. A drainage plan will be submitted with the construction plans.

9-12. Revisions have been made to the final EA to reflect the current organization of the various City and County of Honolulu departments.

Usage and Site Plan

13. The Mauna Lahilahi Cultural Garden Master Plan was derived through collaboration with the community who envisioned Lahilahi as a place for the perpetuation of the Hawaiian culture. As such, ideal conditions for the practice and teaching of the culture was determined to be in small groups. Seven paved stalls and six overflow, unpaved stalls are, therefore, planned. In addition, offsite parking is available on both sides of Lahilahi Street in the event that more parking is needed.

14. The community preference to place the outdoor shower close to the rest room facility was to discourage overnight users of the park. The location of the shower near the "front" of the park was planned as a measure to help monitor unwanted overnight usage.

15. Informational exhibits on the archaeology and flora of the area would be appropriate at the cultural garden and will be considered in the future.

Visual Impact

16. The existing trees at the entrance of the park are approximately 40 feet tall. By contrast, the planned open-air pavilion will be approximately 15 feet high. The planned pavilion may be visible from Lahilahi Street; however, additional hedge plantings will be installed to further screen the garden from the adjacent condominium properties to the north.

17. The pavilion is planned as a 15-foot high, open-air pavilion with a traditional style thatch (or similar material) hip roof. The design and construction of the structure will be by community members when funding for the project is secured.

Flood

18. The final EA has been revised to reflect the AE and VE flood hazard zones.

Traffic

19. The existing entrance to the park from Lahilahi Place is 20 feet wide and will accommodate two-way traffic. The construction plans will specify any required improvements with regard to any necessary improvements at the access driveway to the park.

20. Construction plans for work within the public right-of-way will be submitted for review.

Thank you for participating in the environmental review process.

RKF:ei

WAIANAE COAST NEIGHBORHOOD BOARD NO. 24

c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

June 8, 1999

RECEIVED
DEPT OF DESIGN & CONSTR
C & C OF HONOLULU
99 JUN 10 AM 8:02

Mr. Don Griffin
City and County of Honolulu, Department of Design and Construction
650 S. King Street, 9th Floor
Honolulu, HI 96813

Dear Mr. Griffin:

Re: Mauna Lahilahi Cultural Garden

The Wai`anae Coast Neighborhood Board No. 24 (WCNB#24) unanimously supported a motion to request an extension on the comment period for the referenced project. The board received the information after the agendas for the month of June had been submitted and posted. The board is requesting an extension of 45 days to schedule a review of this project within our board Parks and Recreation committee for recommendations to be heard by the full board at our August 3rd meeting.

This will allow our board to schedule and announce the meetings per the Sunshine Law to properly notify the residents of the community of this endeavor and gather comments and concerns which will allow the board to take an informed position on this topic.

Please respond to me, via the Neighborhood Commission Office, at: 530 S. King Street, Suite 400, Honolulu, HI 96813.

If you have any questions regarding this request, please do not hesitate to contact me at 696-0131.

Sincerely,

Cynthia K.L. Rezentes

Cynthia K.L. Rezentes, Chair
Wai`anae Coast Neighborhood Board No. 24

cc: Neighborhood Commission
Senator Colleen Hanabusa
Representative Emily Auwae
Representative Mike Kahikina
Councilmember John DeSoto

WCNB24CH.99A05

WAIANAE COAST NEIGHBORHOOD BOARD NO. 24

c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

SEP 2 1 1999

September 15, 1999

DonGriffin
c/o City and County of Honolulu, Department of Design and Construction
650 S. King St., 9th floor
Honolulu, HI 96813

Dear Don,

Re: Mauna Lahilahi Cultural Garden

The Wai`anae Coast Neighborhood Board No. 24 (WCNB#24) passed a motion (15 Ayes-2 Nays-1 Abstention) supporting the Mauna Lahilahi Cultural Garden proposal at it's August 3, 1999 regular Board meeting.

Attached you will find a copy of the minutes of a committee meeting held in July which reflects the concerns and comments the community had regarding the project.

If there is anything that our Board can do to help further support the efforts to move the plan along for the community, please do not hesitate to contact me at 696-0131.

Sincerely,

Cynthia K.L. Rezentes

Cynthia K.L. Rezentes, Chair
Wai`anae Coast Neighborhood Board No. 24

cc: Neighborhood Commission
Senator Colleen Hanabusa
Representative Emily Auwae
Representative Mike Kahikina
Councilmember John DeSoto
PBR Hawaii, Ms. Yukie Ohashi

WCNB24CH.99A11

Wai`anae Coast Neighborhood Board No. 24
Parks and Recreation Committee Meeting Minutes
July 12, 1999

Attendance:
Frank Slocum (WCNB), Karen Awana (WCNB), Charles Herrmann Jr. (WCNB), Albert Kahawaii (Mauna Lahilahi St. resident), Charles Popken (Mauna Lahilahi St. resident), James K. Manaku Sr. (WCNB), David K. Keawe (WCNB), Todd Black (PBR Consultant), Cynthia K.L. Rezentes (WCNB)

The meeting was called to order at 7:30 pm by Rezentes (as requested by Chair Paris).

Mr. Todd Black of PBR Hawaii. reviewed the major features of the plan which includes:

- Small parking lot (paved) by the street
- Small open air pavilion
- Small comfort station/shower
- Current pathway improved for wheelchair access
- Current drive would have a pedestrian gate added for access
- An irrigation system would be added
- Most current plantings would be maintained
- Add 2 cultural gardens (one near the current lily pond and one near the beach, both to contain native plants including medicinal plants)
- Additional screening near the property line next to commercial properties
- Small number of picnic tables

In addition to these particulars, Mr. Black also addressed the fact that during the development of this plan the community expressed the desire to have the property maintained as a passive garden with lawn, some tables and a place where the kupuna of the community could utilize the location for the teaching of the future generations of the knowledge they have which should be retained.

Mr. Black mentioned that the current proposal had received only very minor comments thus far.

The comment period which followed after were as listed:

Mr. Kahawaii

- Will volunteer to help control the positive aspects of the park but we need to recognize that there are problems along the entire coast and at times may not be able to control completely
- This facility is for the community and the children for learning
- The difficult part of the plan is to control the area positively
- Supports the plan

Mr. Slocum

- Keep area in "pristine" condition
- He recalls from other community meetings
  - No showers, comfort station, imu, parking lots
  - Yes-marking plaques, overhaul of watering system, locked at night
- By "law" not required to have a restroom, there is nothing within the Parks and Rec. guidelines that a comfort station must be located there
- Has reservations regarding the plan and whether or not it meets all of the input received from prior community meetings

Mr. Manaku

- Supports the plan
- How is it going to affect "me" - access?
  - It was discussed that even though the parking lot may be closed at night, the park would still be open to pedestrian traffic 24 hours per day. Help would be needed from the neighborhood to monitor and report to police, etc.

During additional discussions regarding community interaction to help maintain and "manage" the area, Mr. Kahawaii and Mr. Popken stated they would be willing to "Adoopt-A-Park" including locking/opening access to the parking lot and comfort station.

Mr. Popken

- The area has been a drug haven but the community has gotten involved to attempt to deter that type of activity
- Traditionally comfort stations are "destroyed" at night but the Makaha Beach facility is being kept in good condition because it is locked at night

Mr. Keawe

- Concerned about the parking and could it handle large projects
  - Lot was deliberately made small to discourage overly large gatherings
- Would the gate be open
  - Mr. Kahawaii would volunteer to open/lock the gate
- What about the Wai`anae drive entrance?
  - It would be used primarily for handicap parking.

Mr. Herrmann

- Supports the need for a comfort station for people to effectively use the area, especially during events like story-telling, navigation training, etc.

Ms. Awana

- Endorses the comfort station and parking lot
- What about maintenance?
  - Basic maintenance would be provided by P&R with additional support by the 'Adopt-A-Park' group
- What about lighting in the area?
  - No specifics were discussed. A light would be by the gate

After the conclusion of the discussion and dialogue, **Mr. Herrmann made a motion to support the plan as presented with the Adopt-A-Park group (headed by Mr. Kahawaii and Mr. Popken) to close the parking lot and comfort station at night from 8 p.m. until sunrise. The motion was seconded by Mr. Manaku. The motion passed by a vote of 5-0-1 (Ayes: Keawe, Manaku, Awana, Herrmann, Rezentes, Nays: none, Abstention: Slocum).**

The motion will be placed on the next regularly scheduled Board meeting for action.

The meeting was adjourned, without dissent, at 8:10 pm.

Respectfully submitted by: Cynthia K.L. Rezentes

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

September 28, 1999

Ms. Cynthia K.L. Rezentes, Chair
Waianae Coast Neighborhood Board No. 24
c/o Neighborhood Board Commission
City Hall, Room 400
Honolulu, Hawaii 96813

Dear Ms. Rezentes:

Subject: Response to Comments on the Mauna Lahilahi Cultural Garden
Draft Environmental Assessment (DEA)
Tax Map Key 8-4-01:08 (Por.), Makaha, Oahu, Hawaii

We have reviewed your letter dated September 15, 1999 regarding the Mauna Lahilahi Cultural Garden proposal as described in the DEA.

We note that the Waianae Coast Neighborhood Board No. 24 passed a motion supporting this project. In addition, we note in the Department of Parks and Recreation's committee meeting minutes that two residents of Mauna Lahilahi Street have volunteered to "Adopt-A-Park" and are willing to take responsibility for locking and opening access to the parking lot and comfort station.

The City and County of Honolulu commends volunteerism in public places and the community's support in maintenance of safe parks.

We thank you for the Neighborhood Board's support and for participating in the environmental review process.

Sincerely,

for RANDALL K. FUJIKI
Director

RKF:ei

c: William D. Balfour, Jr., Department of Parks and Recreation

8.0 REFERENCES

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

Chu, M. and R. B. Jones. (1987). *Coastal View Study.* Prepared for the City and County of Honolulu. Honolulu, Hawai'i.

Clark, J. R. K. (1977). *The Beaches of O'ahu.* Honolulu: The University of Hawai'i Press.

Foote, D. E., E. L. Hill, S. Nakamura, and F. Stephens, U. S. Department of Agriculture Soil Conservation Service. (August, 1972). *Islands of Kaua'i, O'ahu, Maui, Moloka'i, and Lāna'i, State of Hawai'i.* Honolulu, Hawai'i.

DHM inc. (1987). *Environmental Assessment: Haggai Institute of Hawai'i, Ltd., Mākaha, O'ahu.* Honolulu, Hawai'i.

Hawai'i, State of . Office of Planning. (1989). *The Hawai'i State Plan.* Honolulu, Hawai'i.

Hawai'i, State Department of Business and Economic Development and Tourism. (1997). *The State of Hawai'i Data Book 1997.* Honolulu, Hawai'i.

Honolulu, City and County of. (1999). Department of Planning and Permitting. Waianae Sustainable Communities Plan. Honolulu, Hawaii.

Honolulu, City and County of. Ordinance No. 83-11 as amended. By Ord. Nos. 84-63, 85-52, 87-129, 88-77, 89-12, 89-144, 93-106, and 94-26. Article 9. Waianae, Part I, Development Plan Special Provisions for Waianae. Honolulu, Hawaii.

Honolulu, City and County of. Ordinance No. 84-54, as amended. By Ord. Nos. 84-111, 85-71, 86-68, 86-76, 87-43, 88-22, 89-9, 90-5, 90-41, 90-43, 90-89, 91-77, 91-78, 91-82, 92-59, 92-143, 93-07, 93-11, 93-14 and 94-26. Chapter 24 Development Plans. Article 1. Development Plan Common Provisions.

Juvik, S. P. and J. O. Juvik editors (1998). *Atlas of Hawai'i.* 3rd edition. Honolulu: University of Hawai'i Press.

Komori, E. K. (1987). *Archaeological Survey and Testing at Mauna Lahilahi, Wai'anae District, Island of O'ahu (Ms. 120787).* Honolulu, Hawai'i.

Linney, G. K. and W. P. Char (1987). *Flora Survey Lahilahi Point, Mākaha, O'ahu.* Honolulu, Hawai'i.

APPENDIX A

Archaeology Report

Ms.120787

ARCHAEOLOGICAL SURVEY AND TESTING AT MAUNA LAHILAHI WAI'ANAE DISTRICT, ISLAND OF O'AHU

Prepared by

Eric K. Komori

Prepared for

Haggai Institute
P.O. Box 13
Atlanta, Georgia
30370

December, 1987

Public Archaeology Section
Applied Research Group
Bishop Museum
Honolulu, Hawai'i

TABLE OF CONTENTS

Page
Abstract..... iv
Introduction..... 1
Geographic Setting..... 1
Environment..... 3
Flora..... 3
Fauna..... 5
History..... 5
Previous Archaeological Research..... 6
Scope of Work..... 7
Research Goals..... 8
Methodology..... 10
Subsurface Transects..... 11
Survey and Excavation Results..... 15
Area A
Site 50-Oa-C3-24..... 17
Site 50-Oa-C4-306..... 20
Site 50-Oa-C4-307..... 23
Site 50-Oa-C4-308..... 27
Site 50-Oa-C4-309..... 32
Site 50-Oa-C4-310..... 35
Site 50-Oa-C4-311..... 39
Site 50-Oa-C4-312..... 39
Area B
Site 50-Oa-C3-25..... 41
Site 50-Oa-C3-26..... 49
Site 50-Oa-C3-27..... 52
Site 50-Oa-C3-28..... 55
Site 50-Oa-C3-29..... 56
Site 50-Oa-C3-30..... 58
Site 50-Oa-C3-31..... 58
Site 50-Oa-C3-32..... 63
Discussion..... 63
Habitation..... 64
Agriculture..... 65
Lithic Manufacture..... 65
Religious Sites..... 65
Settlement Pattern..... 66
Recommendations..... 68
Resource Preservation Concerns..... 70
References..... 73

LIST OF FIGURES

Figure | Page
1. Map of Project Area..... 2
2. View of Project Area..... 4
3. Map of Project Area Showing Areas A and B..... 9
4. Site Location Map..... 12
5. Map of Site 50-Oa-C3-24..... 18
6. North Wall Site 50-Oa-C3-24..... 19
7. Map of Site 50-Oa-C4-306..... 21
8. Features B and D, Site 50-Oa-C4-306..... 22
9. Map of Site 50-Oa-C4-307..... 24
10. TP-1 and Platform, Site 50-Oa-C4-307..... 26
11. Map of Site 50-Oa-C4-308..... 28
12. Interior Alignment, Site 50-Oa-C4-308..... 29
13. Profile of North and West Faces, TP-1, Site 50-Oa-C4-308..... 31
14. Map of Site 50-Oa-C4-309..... 33
15. View of Site 50-Oa-C4-309..... 34
16. Map of Site 50-Oa-C4-310..... 36
17. Entrance to Enclosure, Site 50-Oa-C4-310..... 37
18. Interior of West Wall and TP-2, Site 50-Oa-C4-310..... 37
19. Map of Site 50-Oa-C4-311..... 40
20. Map of Site 50-Oa-C3-25..... 42
21. View of 50-Oa-C3-25..... 43
22. Profile of TP-1, Site 50-Oa-C3-25..... 44
23. West Face, TP-1, Site 50-Oa-C3-25..... 45
24. Fishhook from TP-1, Site 50-Oa-C3-25..... 45
25. Petroglyphs, Site 50-Oa-C3-26..... 50
26. Petroglyphs, Site 50-Oa-C3-26..... 50
27. Petroglyphs, Site 50-Oa-C3-26..... 51
28. Map of Sites 50-Oa-C3-27 and 50-Oa-C3-28..... 53
29. West Wall, Site 50-Oa-C3-27..... 54
30. Map of Sites 50-Oa-C3-29 and 50-Oa-C3-30..... 57
31. Map of Site 50-Oa-C3-31..... 59
32. Interior of 50-Oa-C3-31..... 60
33. Shell Ornament, Site 50-Oa-C3-31..... 60
34. Map Showing Portions of Area A to be Monitored..... 71

LIST OF TABLES

Table Page

1 Cross list of Site Numbers..... 16
2 Site C3-25, TP-1 Stratigraphy..... 46
3 Midden, Site 50-Oa-C3-25, TP-1..... 48
4 Midden, Site 50-Oa-C3-31, TP-1..... 62
5 Summary of Site Function, Chronology..... 64
6 Archaeological Site Evaluations..... 69

ABSTRACT

Two levels of archaeological investigations were conducted on a parcel of land located at Mauna Lahilahi, on the coast at Mākaha, Wai'anae, island of O'ahu. A reconnaissance level survey of approximately six acres where no previous archaeological work had been done identified eight sites. The sites were mapped and test excavations of four sites located subsurface deposits in three. Detailed mapping and more extensive test excavations were conducted on approximately five acres that had been previously surveyed. Five previously identified surface sites and three additional sites were located and mapped. Test excavations identified subsurface cultural deposits in four of the sites. Subsurface testing was conducted along six transects, however, no intact deposits were found. The results of midden and artifact analyses show a primary association with prehistoric marine activities for the general area. The architectural features and surface deposit of five sites may indicate an association with religious activity. Lithic material from one site, however, is related to the production of stone tools. Analyses of eight radiocarbon dates indicate that prehistoric occupation of the study area may have begun c. A.D. 1300. With the exception of two structures that are related to recent activity in the area, all sites are recommended for preservation. For the presently deteriorating portion of the lithic site intensive data recovery is recommended.

INTRODUCTION

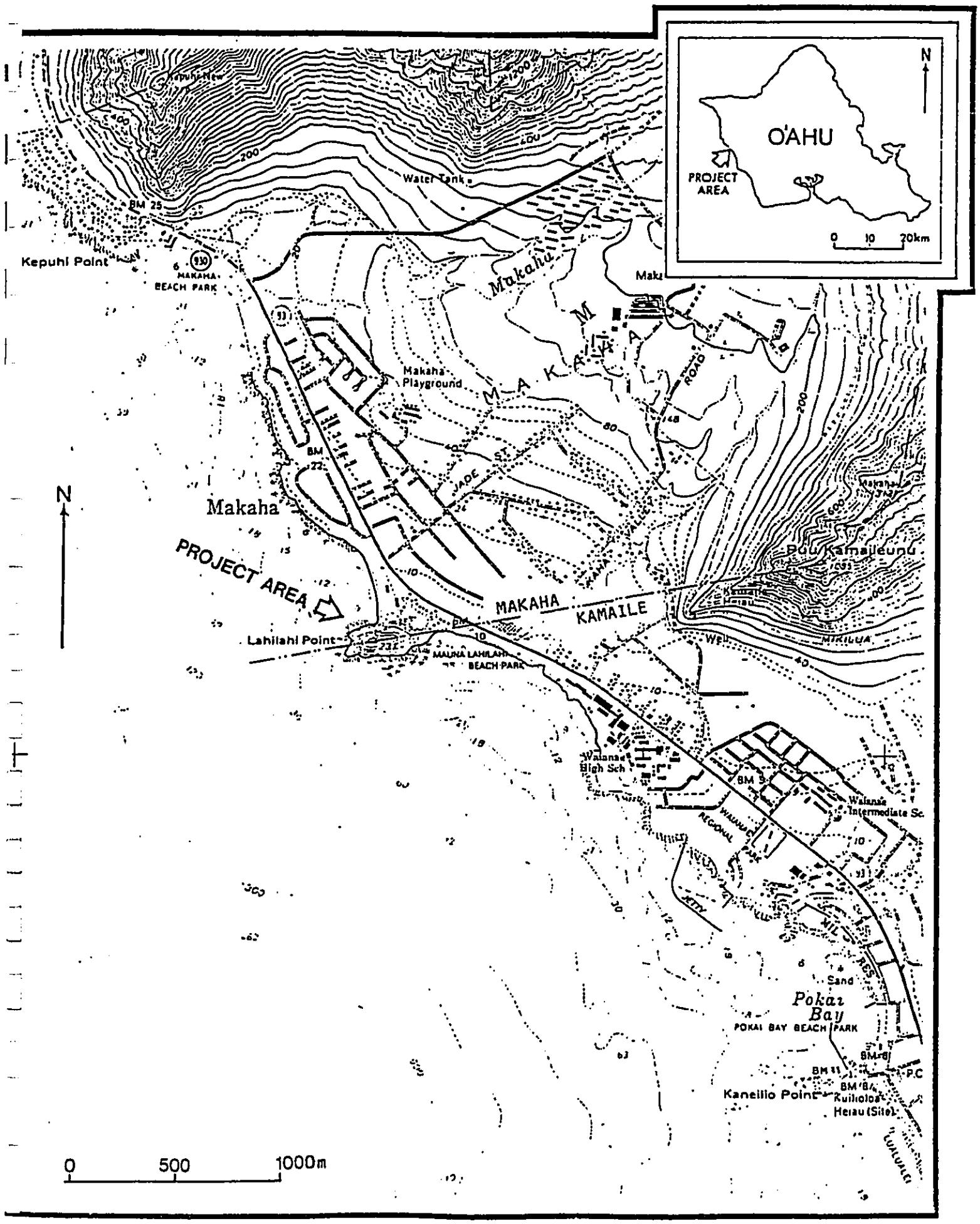
This report presents the results of an archaeological study of a parcel of land at Mauna Lahilahi, Mākaha, Wai'anae District on the island of O'ahu, Hawai'i (Fig. 1). The study was conducted under contract to Haggai Institute by the Public Archaeology Section, Applied Research Group (ARG), Bishop Museum. The fieldwork was conducted between September 14 and October 6, 1987 by the author, Stephan Clark, Jeannette Simons, James Toenjes and Jeffery Yamauchi. All records, artifacts and samples are deposited in the Department of Anthropology, Bishop Museum. I would like to express my appreciation to the many individuals and organizations that provided valuable assistance, information, and advice during the course of the study.

GEOGRAPHIC SETTING

Located on the west coast of O'ahu, the study area (Tax Map Key 8-4-01:8&9, 8-4-03:11, 8-4-04:5&9) is situated on a small peninsula jutting out from the main island, and has an area of 11.145 acres (Fig. 1). The surface of the northeastern half of the study area (Area A) has undergone extensive alteration due to modern activities including grading for roads, parking areas, a house, and landscaping. Other disturbances to the area include excavation of a swimming pool, a cesspool, sewage and water lines, and two ponds.

Numerous houses, large apartment buildings and related facilities have been built on the low land that extends inland and there are very few, if any, undisturbed areas in the vicinity.

The literature reviewed for this study show that the boundary between the two *ahupua'a* (traditional Hawaiian land division) of Kamaile and Mākaha, passes through the center of the parcel. Local informants, however, say that the entire peninsula is considered to be part of Mākaha.


O'AHU
PROJECT AREA
N
0 10 20km
Kepuhi Point
MAKAHA BEACH PARK
Water Tank
Makaha
Makaha Playground
MAKAHA
Makaha
PROJECT AREA
MAKAHA KAMAILE
Lahilahi Point
MAUNA LAHILAHI BEACH PARK
Puu Kamaileunu
Waianae High Sch
Waianae Intermediate Sc.
Pokai Bay
POKAI BAY BEACH PARK
Kaneilio Point
Kuiliolo Heiau (Site)
0 500 1000m

ENVIRONMENT

The study area is situated at the southern boundary of Mākaha valley, one of the major valleys located on the dry leeward coast of O'ahu. Mauna Lahilahi, a rocky peak that abruptly rises to an elevation of 70 m (230 ft) a.m.s.l. (above mean sea level), occupies about sixty percent of the study area and dominates the landscape (Fig. 2). Rainfall averages about 508 mm (20 in) per year (Armstrong 1983). Although a slight difference in the environments of the windward (east) and leeward (west) areas of the study area was noted, the contrast is not great.

In areas with an elevation above 15 m the surface is primarily composed of outcrops of basalt bedrock and boulders, while lower slopes are covered by talus. The surface in these areas is primarily bare rock, however, shallow pockets of soils and sediments are intermittently present. The entire peak is considered to be part of the lower member of the Wai'anae Volcanic Series and "is a remnant of a deeply drowned interstream divide" (Stearns 1939:58).

An apron of coral conglomerate circles the peak. The elevation of the exposed conglomerate material ranges from less than 1 m a.m.s.l. near the ocean, to about 6 meters a.m.s.l. on the inland side of Lahilahi. The presence of the raised reef shows that the peak has been isolated from the main island during fluctuations in sea level, however, the last large change occurred well before human occupation of the Hawaiian Islands (Macdonald 1983:284). The sediments present on the low area connecting the rock peak with the main island range from deep coral sands to thin isolated deposits of sediments that appear to be related to the general soil associations found in the Wai'anae area. Based on comparisons with descriptions from regional soil surveys some of these sediments are related to the Waialua Silty Clay series that have been described for the area at the mouth of Mākaha valley (Foote, et al 1972).

Flora

Although native plants such as *hinahina* (*Heliotropium anomalum* var.) and *'ilima* (*Sida fallax*) are present, modern introductions dominate the flora of the area. *Kiawe* (*Prosopis pallida*) and *koa haole* (*Leucaena glauca*) are the most numerous and form dense thickets in undisturbed areas.

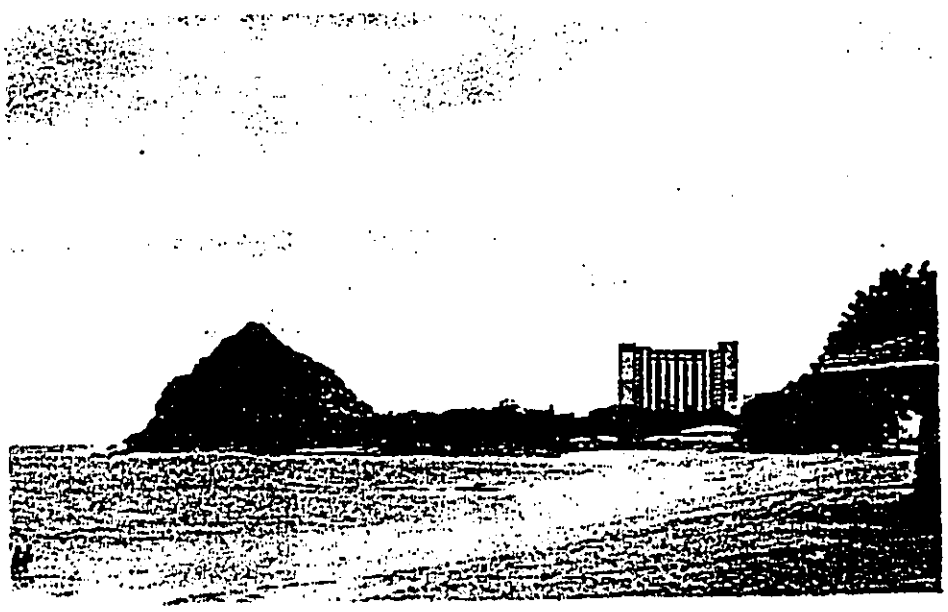


Fig. 2. VIEW OF SOUTH COAST OF MAUNA LAHILAHI. View to Northwest.
BPBM Neg. No. Oa(a)366-36.

Coconut trees (*Cocos nucifera*), *kou* (*Cordia subcordata*), ti (*Cordyline terminalis*), taro (*Colocasia esculenta*), and a number of other plants that were economically useful to prehistoric Hawaiians are present, however, these are isolated examples that were cultivated and maintained by modern landscaping activities since about 1935 (local informant).

A wide range of exotics are present in the extensive, landscaped area, and include the banyan (*Ficus* sp.), mango (*Mangifera indica*), plumeria (*Plumeria* sp.), bougainvillea (*Bougainvillea* sp.), tahitian gardenia (*Gardenia tahitiensis*) and night blooming cereus (*Hylocereus lemairei*).

Fauna

Feral rats and mice were noted in the area during the fieldwork and a cat was also present. Mynah birds, doves and bulbos were common in the area and frigates were frequently seen soaring over the high peak of Lahilahi.

HISTORY

Very little of the traditions concerning Mauna Lahilahi have been documented. The only tradition that was found is in the "Legend of Aiai" (Beckwith 1970:22-23). In this story, Aiai marks the fishing grounds for many areas of the Hawaiian islands with altars, stones, and enclosures. One of the fishing grounds noted is Mauna Lahilahi in Wai'anae district.

Vancouver was the first westerner to describe Mauna Lahilahi. In March of 1793 he described the area as "a high rock remarkable for its projecting from a sandy beach" and that at "a distance it appears to be detached from the land" (Vancouver 1978:217).

An excellent presentation of the early history of the general area (including most of the Wai'anae coast) is provided by Green in his study of Mākaha. The reader is referred to that work for general information about the study area. Specific information concerning the early historic period in the Mauna Lahilahi area is limited. This is not surprising since the main areas of early historic occupation appear to have been in the interior of the valley. The earliest relatively detailed map of the area was drawn in 1884 by George

Jackson for the Hawaiian Government Survey (Jackson 1884). On this map he has drawn a structure that appears to be an enclosure, near the location of one of the archaeological sites located during the present work (Site 50-Oa-C4-310) and, interestingly enough, Site C4-310 is a stone walled enclosure. A newspaper article referred to by Green states that sometime in the 1880's the Mauna Lahilahi area was fenced across to keep sheep and it is likely that the enclosure served a similar purpose at the time.

In the early part of the 19th century, the entire valley of Mākaha was under the control of Abner Paki. Soon after his death in 1855, the valley was sold to James Robinson and Company and in the legal documents related to the sale, Mauna Lahilahi is shown as divided in half, the northern half assigned to the *ahupua'a* of Mākaha and the southern half to the *ahupua'a* of Kamaile (Fig. 1). This division is also shown on a map from c. 1850 (Makalena, n.d.) that defines the boundaries of the fishing grounds for Mākaha and Kamaile.

PREVIOUS ARCHAEOLOGICAL RESEARCH

From 1968 through 1970 the fieldwork portion of the Makaha Valley Historical Project was conducted. This ambitious project resulted in the publication, by the Bishop Museum, of four initial volumes presenting the data, analyses and interpretations (Green, 1969 and 1970) (Ladd and Yen, 1972) (Ladd, 1973). The latest museum publication in this series, *Mākaha before 1880 A.D.*, (Green, 1980) is a synthesis of the earlier volumes. Green incorporates ecological, historical and archaeological data into an analytical framework that links the archaeology of Mākaha with more general problems related to the development of traditional Hawaiian socio-political systems.

In reconstructing the settlement of Mākaha, he uses data from other studies to establish a date range of A.D. 1100 - 1400 for initial occupation. He notes that these sites were probably situated near well-watered areas, which would include the coast of Kamaile (east of the present study area) and the northern boundary of the valley mouth (Fig. 1). Green's analysis shows that the subsequent development of an extensive dry-land field system in nearby inland areas was rapid and that the "territorial base of Mākaha *ahupua'a* as a localized lineage headed by a chief was fully established, if not immediately upon

The next development occurred about A.D. 1500 when wet taro systems were developed in the interior of the valley and a large *heiau* (religious site) was built, midway up the valley. These events are thought to "reflect a shift of permanent population from the coast to an inland zone of lower population density" (Ibid:76).

In marked contrast to the inland areas of Mākaha, no research had been conducted in coastal areas until January, 1986. At this time, a surface survey of the northeast third of the study area was conducted by Archaeological Consultants of Hawaii, Inc., however, the exact area involved is not clear (Kennedy, 1986). The research concentrated on locating and recording surface structures, and five sites were identified (Kennedy Sites 1 through 5). These structures were re-located during the present study and are cross-listed in Table 1.

In addition to mapping and recording all of the structures, Kennedy excavated a trench in Site 1. Site 2 was reconstructed after examination of its already exposed interior (no artifacts nor midden were reported from either site). Site 5 was described as having an "operational deposit" and considered to "lend itself to subsurface recovery", however, no excavations were conducted (Ibid). Sites 3 and 4 were reported as having very poor excavation potential and no further work was recommended.

Preservation of Site 2 was recommended, however, no further work was recommended for any of the other sites, "with the provision that Sites 1 and 5 enjoy a protective status under the new ownership" (Ibid).

SCOPE OF WORK

In addition to the principal objectives of defining and interpreting the archaeological resources in the study area, this study also provides evaluations and recommendations for resource management. Although there is a tendency to focus on each site itself in making these assessments, broader local and regional concerns are considered to be significant for the study area, and are given considerable weight.

About one half of the study area was the subject of a previous archaeological reconnaissance survey of surface structures (Kennedy 1986) while the present study constitutes the first formal archaeological inquiry for the remainder of the parcel. For the purposes of the present investigation, the area is divided in two (Fig. 3):

Area A - the previously surveyed area
Area B - the unsurveyed area

In terms of the current fieldwork, an intensive survey of Area A was conducted, while in Area B a reconnaissance level survey was completed. In Area A the work consisted of detailed mapping of all surface structures, and subsurface testing. Test pits were excavated in at all but two of the eight sites located in this area, site C4-306 (previously tested by Kennedy) and site C4-312 (possibly a prehistoric trail). Six transects of subsurface tests were also conducted here. In Area B all sites were mapped in detail, however, test excavations were much more limited. Test pits were excavated in four sites and no subsurface transects were conducted here.

A literature search for relevant documents including maps, journals, public documents, and manuscripts was also done.

RESEARCH GOALS

The primary focus of the present investigation is the relationship of the archaeological sites found in the study area to the results of previous studies undertaken in the interior of Mākaha Valley. These studies (see above- Previous Research) indicate a shift in the focus of prehistoric settlement from the coast, to inland areas. The model developed, however, relied on a inference, to a large extent, since no coastal site had been excavated. Although limited by its scope, this study seeks to test the model by recovering information on the chronology and function of the sites located on the coast near Mākaha.

More specifically related to the study area, but also relevant to this model, is the question of the location of the traditional Hawaiian land boundaries in this vicinity. As noted above, it appears that Mauna Lahilahi

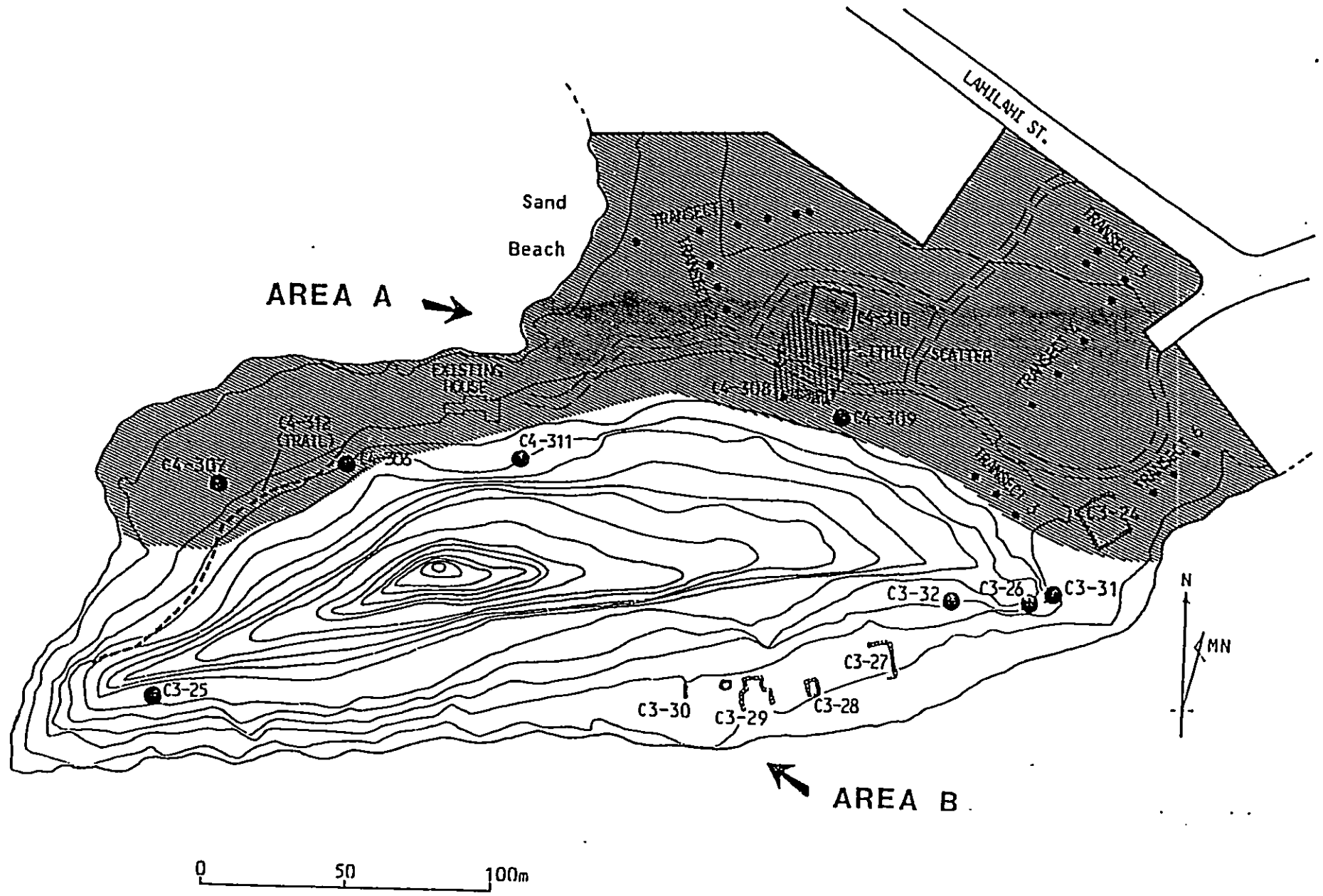


Fig. 3. MAP OF PROJECT AREA SHOWING AREAS A AND B.

possibility has an obvious bearing on any interpretation of the relationship of archaeological sites found in the project area to settlements in interior areas. This topic is explored with regard to preliminary interpretations of site function. (see below-Discussion).

METHODOLOGY

Because the area covered by the previous survey of the study area was unclear, a reconnaissance survey of the entire parcel was conducted to locate all archaeological surface structures and surface deposits. With the exception of vertical cliff faces, virtually 100 percent of the area was surveyed.

Maps of all structures (including previously located ones) were drawn using instrument mapping techniques (alidade or transit), or tape and compass as appropriate. All measurements were taken using the metric system. Site locations were plotted on a detailed topographic map with a 2 foot (61 cm) contour interval and a scale of 1/384. Black and white photographs of each site were taken and are assigned Bishop Museum negative numbers (BPBM Neg. No.).

Test pits were excavated by hand, initially using arbitrary levels for vertical control, but when natural layers were identified, excavation proceeded using levels within each layer. Excavated material was sifted through 1/4 inch and 1/8 inch mesh screen and all midden and artifacts from intact cultural layers were retained. For disturbed layers, a representative sample of midden materials was kept for analysis.

Six subsurface test transects were conducted in areas where surface structures and midden deposits were not present. These tests were excavated using a three inch (7.6 cm) diameter auger and were enlarged when necessary, using hand tools.

Soil descriptions were completed for all test excavations and include information on dominant color (based on Munsell Soil Color Charts) texture, composition, and layer boundary.

Charcoal samples for radiocarbon analysis are referred to by Bishop Museum,

using 5568 years as the half-life of radiocarbon, and the modern standard of 95 percent of the activity of the National Bureau of Standards Oxalic Acid. The CALIB computer program developed at the University of Washington, Quantenary Isotopes Laboratory in Seattle was used to calibrate radiocarbon ages (Stuiver and Reimer 1986). The reference data for the calibrations is the decadal (10 year interval) data published in 1986 (Stuiver and Becker 1986).

Except for HRC-969, the radiocarbon ages are not adjusted for 013/012 ratios. Calibrated date ranges are rounded to the nearest 50 years and except for HRC-973, all ranges are for the 95 percent (2 standard deviation) confidence level. For HRC-973, other relevant data indicates the increased statistical uncertainty of using the one standard deviation confidence level is acceptable.

SUBSURFACE TRANSECTS

The six subsurface transects in Area A are numbered A1 through A6 (Fig. 4). No intact cultural deposits were located in any of the areas sampled. However, a badly fragmented, pearlshell fishhook and very sparse midden was recovered from TP-3 in transect A1.

With the exception of the coral sand dune area of transect A1, where sand sediments are over 1.5 m. deep, all auger test and test pits were excavated to the coral conglomerate substrate. In these areas the substrate was exposed or covered by only a few centimeters of sediments. A summary description of the subsurface deposits found in each transect is presented below.

As mentioned in the section on geology, the clay sediments layers found in this area appear to be related to the Waialua Silty Clay series described for areas inland of the study area. Near Mauna Lahilahi the well developed clays appear to be remnants of more extensive deposits that may have existed when the Waialua series was originally formed. Subsequent erosion may have removed most of the original deposition and left the isolated pockets that are now present in the study area.

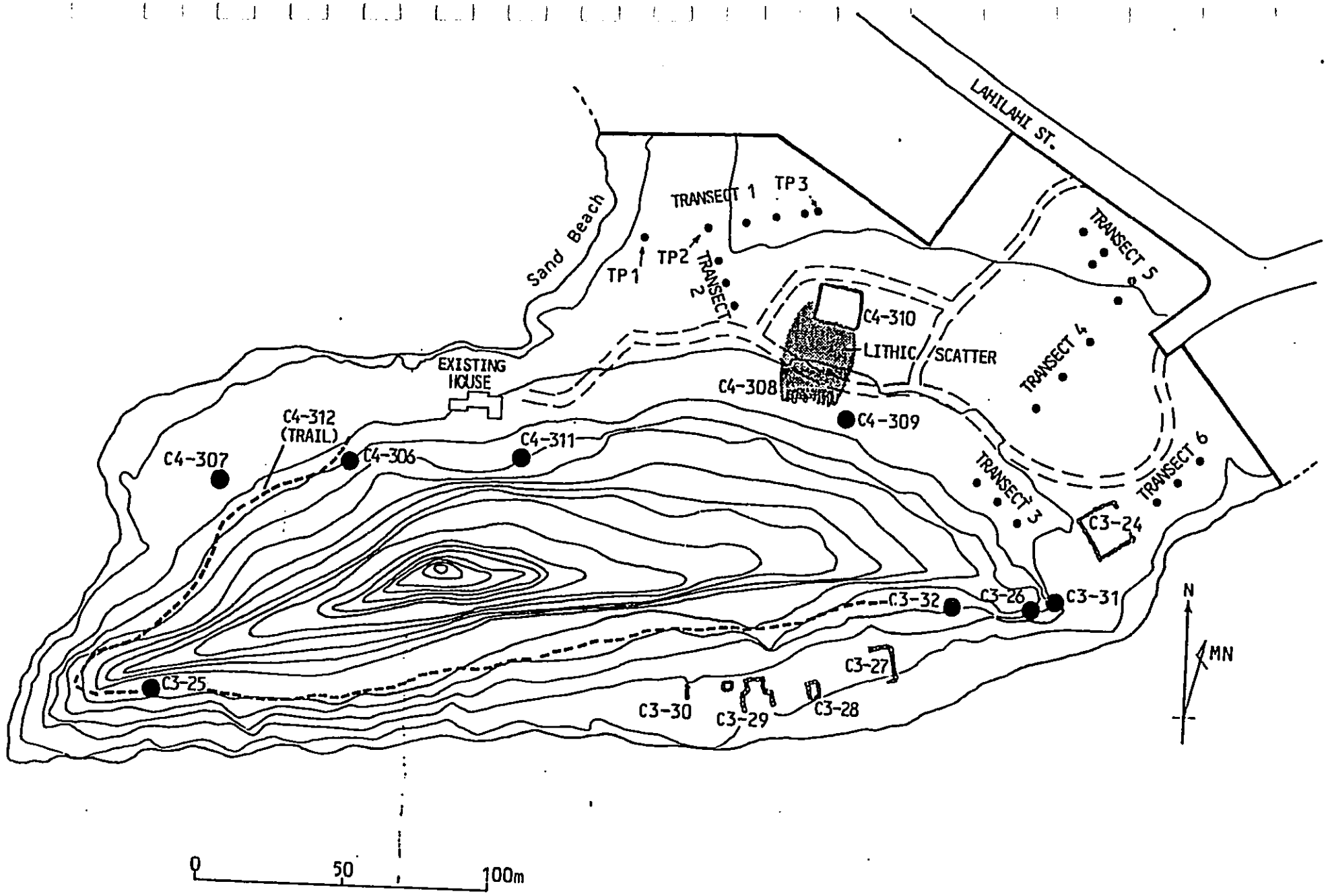


FIG. 4. MAP OF PROJECT AREA SHOWING APPROXIMATE LOCATIONS OF ARCHAEOLOGICAL SITES.

Transect 1

This transect consisted of three test pits (TP-1, TP-2, TP-3) and three auger tests extending from the top of the high coral sand dune (c. 4.9 m a.m.s.l.), down the gradual inland slope to the dunes lowest elevation of c. 2.4 m a.m.s.l. (Fig. 4). The sediments here range from the clean coralline sand at the top of the sand dune to bedded layers of coral sand mixed with terrigenous clays and silts, in lower areas.

TP-1 (1.0x1.0 m) was located at the highest point of the sand dune and excavated to a depth of 1.5 m below surface. The deposit under the 5 centimeter thick overburden entirely consisted of loose, clean, coral sands with no internal layering. No artifacts nor midden were found.

Located on the inland slope of the sand dune, TP-2 (1.0x1.0 m) was excavated to a depth of 1.8 m below surface. The upper 40 centimeters of deposit consisted of dune sand with few glass fragments, and charcoal flecking. From 40 to 95 centimeters below surface the grayish brown (10YR 5/2) bands of staining were present in the coral sand matrix. From 95 centimeters below surface to the limit of the excavation, the deposit consisted of clean coral sand. No artifacts nor midden were found.

TP-3 (75x75 cm) was excavated at the lowest elevation in this vicinity and six layers were observed:

Depth	Layer	Description
0-2	Overburden	Decomposing organic material
2-10	I	10YR 7/4; very pale brown; 50% terrigenous clay and silt with 50% fine to medium calcareous sand; weak fine crumb structure, abrupt smooth to wavy boundary.
10-13	II	Similar color and structure to Layer I but with finer sand component, very abrupt boundary.
13-23	III	10YR 3/4; yellowish brown, sandy loam; weak medium crumb structure; very abrupt smooth boundary.
	III (lenses)	10YR 4/3; dark brown, silt with rare calcareous sand; moderate very fine angular structure; clear, wavy boundary. 2-3 cm thick lenses.

Depth	Layer	Description
23-30	IV	10YR 7/4; very pale brown; 90% terrigenous clay and silt with 10% fine to medium calcareous sand; moderate fine angular structure; sticky and slightly plastic when wet; clear smooth boundary.
30-37	V	10YR 4/3; dark brown silt with rare calcareous sand; moderate very fine angular structure; very abrupt wavy boundary.
37-42	VI	10YR 7/4; very pale brown; 60% terrigenous clay and silt with 40% fine to medium calcareous sand; moderate medium/fine subangular structure; abrupt smooth to wavy boundary.
42-?	Bedrock	Coral reef conglomerate.

The pearl shell fishhook was recovered from layer IV at a depth of 25 cm below surface. The deposit at this level is probably aeolean and appears to be related to the clay deposits found in site C4-310, directly upslope from this test pit. Other than the fishhook, only a sparse midden comprised of 3 marine shells was recovered and no features were encountered during the excavations.

Transect 2

This transect consists of two auger holes and a test excavation (50x50 cm) extending from the inland slope of the sand dune towards the slope of Mauna Lahilahi. Under the organic layer that covers the surface is the disturbed layer of clay resting on coral reef conglomerate. The soil matrix in this area is very similar to the clays of Layer V in Transect 1 (TP-3) and at Site C4-310.

The area has been extensively disturbed and subsurface deposits contain a mixture of modern debris that includes bottle glass, metal fragments, gravel from road construction, and fragments of plastic.

Transect A3

Transect A3 is located at the base of the steep talus slope of Lahilahi and consisted of three auger tests and a 50x50 cm test pit. No artifact, midden nor cultural material of any kind was found in this area. The soil matrix under the organic layer consists of a clay that appears to be related to the clay

layers found in Transects A1 and A2. The substrate in this area consists of basalt boulders and outcrops.

Transect 4

This transect extends inland from the area below Transect A3, down and parallel to the slope. Three auger tests were conducted in this area. The deposit here consists of a thin (10 cm) layer of primarily organically derived sediments on a coral conglomerate substrate. The conglomerate material lies very close to the surface throughout this area and is exposed in many places. No artifacts nor midden were found.

Transect 5

Located in the area farthest inland, this transect also crosses the lowest point in this vicinity and the coral conglomerate conglomerate substrate in this area is exposed. Five auger tests were conducted in this area.

A very thin layer sediment primarily derived from organic materials and weathered coral is present in irregularities in the substrate. No artifacts no midden were found.

Transect 6

This transect is located on a grass lawn at the southeast corner of the parcel and consists of two auger holes and a test excavation (50x50cm). The southern border of this area is actively eroding, due to wave action, and was examined for the presence of cultural deposits and subsurface features. The coral substrate here underlies a thin mixture of weathered coral and terrigenou sediments, that is less than 20 cm thick. The extremely even surface and extremely thin overburden indicates that this area has been graded by modern machinery. No artifacts nor midden were found.

SURVEY AND EXCAVATION RESULTS

This section presents the results of mapping and excavation of the 16 archaeological sites identified during the present work (Fig. 4), including the five structures previously located by Kennedy. Each of the archaeological site is described, the details of test excavations (if any) summarized, and discusse

with regard to possible interpretations. The sites are grouped according to the area that they are located (Area A and Area B). All structural measurement are for maximum dimension unless specified and excavation depths are in centimeters below surface (b.s.).

References to the sites use the Bishop Museum numbering system. In this system, 50 = State of Hawai'i; Oa = Island of O'ahu; C = Wai'anae District; 3 = *ahupua'a* of Kamaile; 4 = *ahupua'a* of Mākaha; 306 = the discrete site number. Therefore, Site 50-Oa-C3-306 is site number 306 in Kamaile *ahupua'a*.

State of Hawai'i archaeological site numbers have also been assigned. In this system, 50 = State of Hawai'i; 80 = Island of O'ahu; 07 = the Wai'anae quadrangle of the U.S.G.S map series; 3704a = the discrete site number.

Table 1 is a cross-listing of the Kennedy, State, and Museum site numbers.

Table 1
Cross List of Site Numbers

Museum Site No.	State Site No.	Kennedy Site No.
AREA A		
50-Oa-C3-24	50-80-07-3704a	
C4-306	-3704j	1
-307	-3704k	2
-308	-3704l	3
-309	-3704m	4
-310	-3704n	5
-311	-3704o	
-312	-3704p	
AREA B		
50-Oa-C3-25	-3704b	
-26	-3704c	
-27	-3704d	
-28	-3704e	
-29	-3704f	
-30	-3704g	
-31	-3704h	
-32	-3704i	

AREA A

Site 50-Oa-C3-24

This site is an enclosure that is situated near the eastern base of a high outcrop of basalt bedrock on which Sites C3-25 and C3-26 are located. The enclosure is rectangular that measures 15.5 and 16.5 m (Fig. 5, 6). The northeast wall has been extensively disturbed, and a row of ornamental plants has been planted, but a few base stones remain. The walls of the structure are primarily constructed of stacked angular to subangular basalt interspersed with a few waterworn beach stones and chunks of coral conglomerate. The average diameters of the construction materials range from 20 to 40 cm. The walls range from 1.0 to 1.5 meters in width and from 30 to 103 cm in height. Vegetation in the area consists of *kiawe* trees (*Prosopis pallida*) and *koa haole* (*Leucaena glauca*) and various weeds and grasses.

No interior features are present, however, an alignment of large upright stones that extends from the south corner of the structure to the southwest is present, and appears to have been constructed to support a water pipe that is still present.

Two test pits (TP-1 and TP-2) and three auger tests were excavated inside the enclosure. No prehistoric-type midden nor artifacts were found inside the structure. In these pits a large number of lead bullet heads (primarily 0.30, 0.38, and 0.45 caliber) and a few glass fragments were found.

Two test pits (TP-3 and TP-4) and seven auger tests were situated outside the structure. No intact cultural deposits were present in the eight auger tests, however a pit feature was found in the test pits.

Test pits 3 and 4 are located 4 m northeast of the enclosure. Two sediment layers overlying the coral conglomerate substrate were observed:

Depth	Layer	Description
0-5	I	10YR 4/6; dark yellowish brown loam; moderate, fine crumb structure; bullets, glass fragments, and other modern debris.
5-28	II	10YR 5/6; yellowish brown loam; moderate, medium crumb structure; abrupt, wavy boundary; no cultural material.

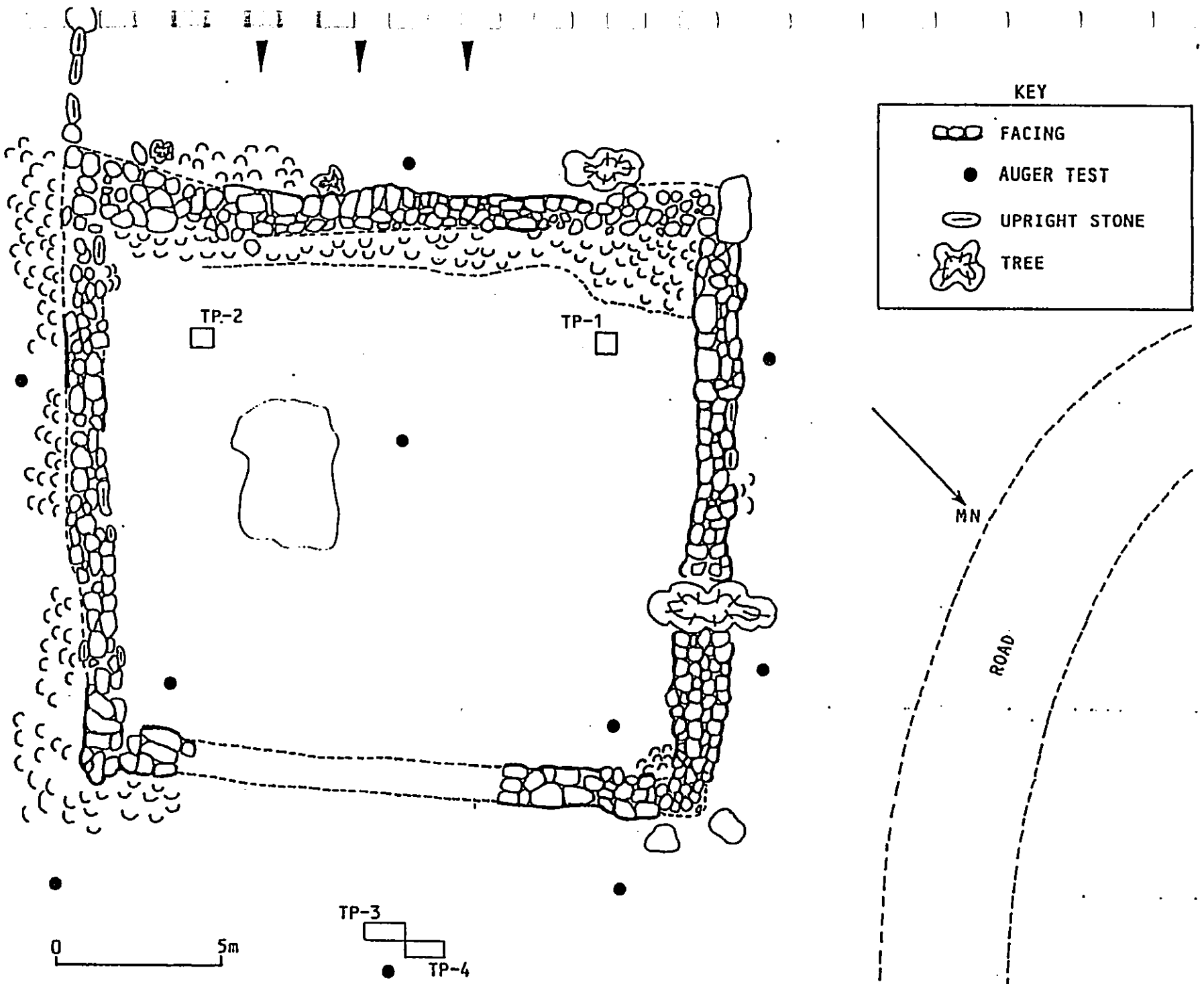


FIG. 5. MAP OF SITE 50-OA-C3-24.

FIG. 6. NORTHWEST WALL OF SITE 50-OA-C3-24.
View to Southeast. BPBM Neg. No. Oa(a)366-35.

At the intersection of TP-3 and TP-4 a 10 cm thick lens of weakly formed, dark grayish brown (10YR 4/2) loam formed a shallow pit c. 80 cm in diameter in Layer II (Fe A). A small amount of midden and large quantity of charcoal was present in the deposit but no ash lenses or other indications of firepits was present. No prehistoric-type artifacts were found during the excavation.

The total midden from one square meter of excavation consisted of 6.4 grams of fish bone (including two shark teeth), and 35.4 grams of marine shell. A charcoal sample (HRC-969) was collected from Feature A (28 cm B.S.) and analyzed for radiocarbon. The age of this sample was 490±60 years and the calibrated date range for this sample is from A.D. 1300-1500.

Discussion

Feature A appears to be the remnant of what was previously a more extensive cultural deposit. The boundary between Layer I and the underlying deposits suggests that some sort of grading activity removed the upper part of the deposit leaving the material in Feature A (a depressed area). Although data on the occupation represented by Feature A is sparse the radiocarbon date range of 1350-1500 for the deposit is useful in the establishment of a chronology of prehistoric-type activity for the area.

The walled enclosure does not appear to be related to the deposit found in TP-3 and TP-4. The complete absence of prehistoric-type artifacts and midden in the areas tested suggests that it is unrelated to the prehistoric activities associated with the deposition of Feature A. A local informant indicates that the structure was used as a house site in the early 1900's.

Site 50-Oa-C4-306

This site is a series of four contiguous depressions (Features A-D) and a stone alignment (Feature E) constructed at the base of a talus slope on the north side of Mauna Lahilahi (Fig. 7). A trail (Site C4-312) is located downslope of the site. *Kiawe* (*Prosopis pallida*) dominates the vegetation of this area. No artifacts or midden were found on the surface of the site.

Feature A is defined by a rough circle, constructed of 20-40 cm diameter boulders, measuring 2.3 m in diameter and 30 cm deep. Feature B is oblong and measures 2.5 m by 1.6 m (Fig. 8). It is defined on the west (downslope) by a

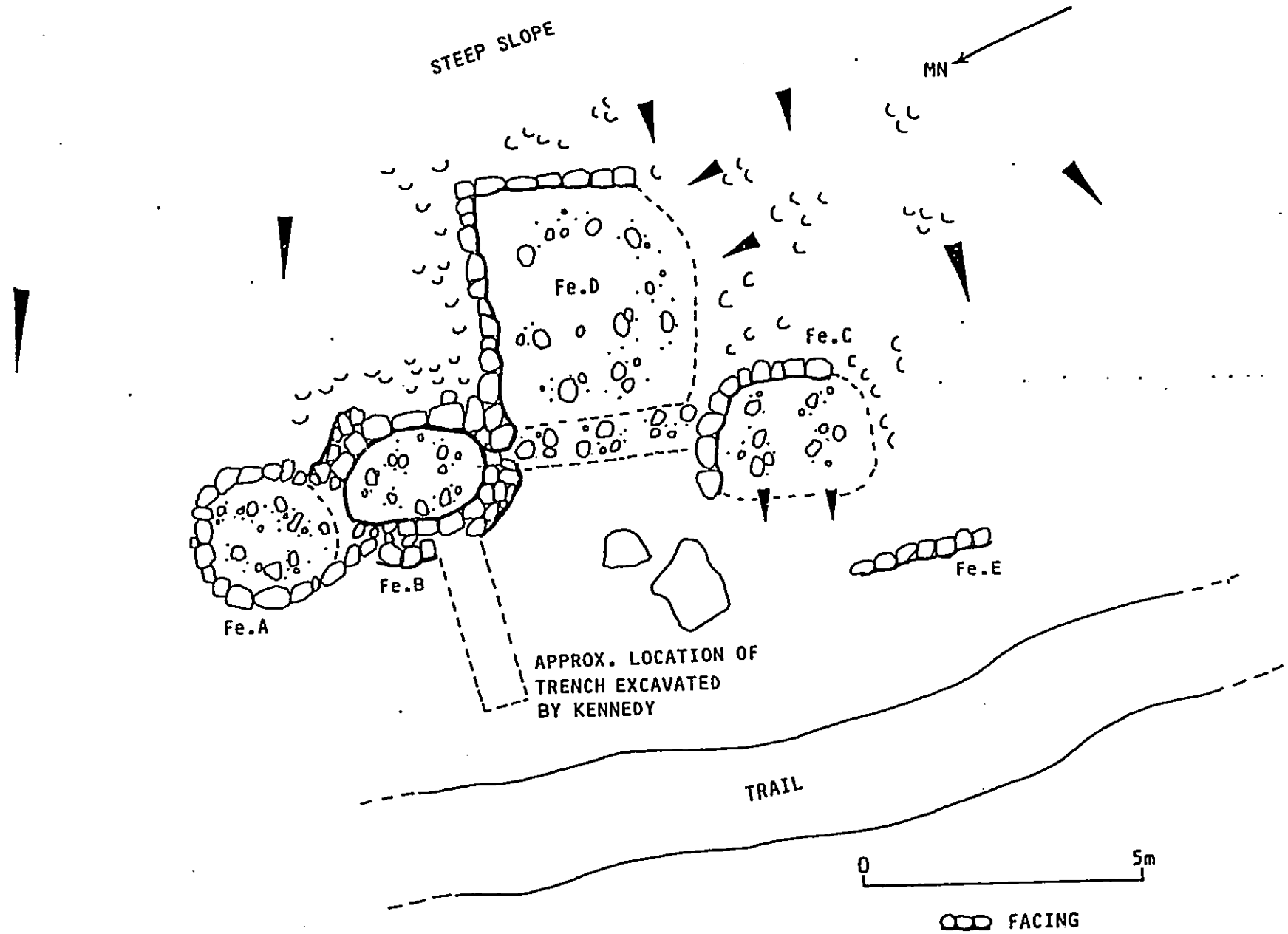


FIG. 7. MAP OF SITE 50-OA-C4-306.

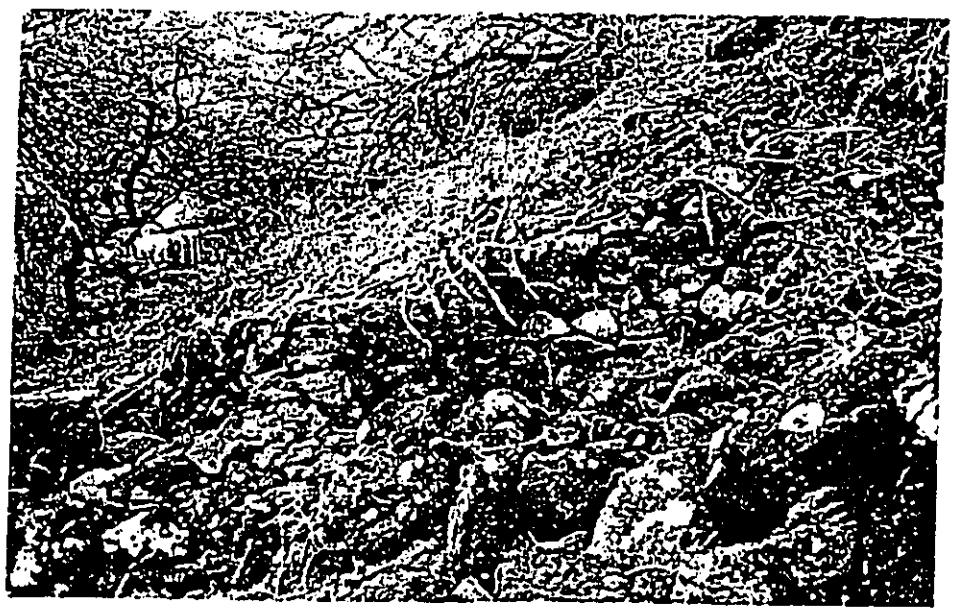


FIG. 8. FEATURE B (center-left) AND FEATURE D (center), SITE 50-Oa-C4-306. BPBM Neg. No. Oa(a)365-35.

low wall constructed of stacked stone, and its upslope boundary is defined by a well-constructed terrace c. 1.6 m high. Feature C is roughly circular and consists of a 80 cm high terrace constructed against the talus slope. The downslope portion of the depression is open. Feature D is a 1.2 m high L-shaped terrace constructed against the talus slope defining a rough square open on two sides. Feature E is an single stone alignment in talus rubble, and is 2.3 m long and 40 cm high.

Discussion

Previously described as a large structure with an area of 400 square meters, constructed of imported stone, this structure was thought to be a religious site (Kennedy, 1986). The previous work included the excavation of a trench and observations during the present fieldwork indicate that it was located in Feature B. It seems that no artifacts or midden were recovered from the trench.

Although some features may be completely buried in rubble, it is extremely unlikely the entire talus slope constitutes a site. It is also unlikely that the material was imported since similar material is present in nearby talus areas. The rationale for interpretation of the site as having a religious function is unclear. Virtually all of the architectural features that are associated with Hawaiian *heiau*, such as level terraced areas, platforms, and enclosures, are not present. Items commonly associated with shrines, such as coral fragments and waterworn stones are absent.

It is more likely that the depressions are associated with agricultural activities. One possibility is that the depressions were used for planting crops as sweet potato has been reported as a crop in rocky areas. (Handy and Handy 1972:129-131).

Site 50-Oa-C4-307

This site is a platform and terrace located at the inland border of the raised coral reef, west of Site C4-306. The platform was reconstructed during the previous study (Kennedy, 1986) and subsequently, the SW corner has been badly damaged. Its current dimensions are 3.5 m by 2.7 m. Constructed of stacked angular basalt boulders and coral conglomerate fragments, the platform is approximately 80 cm high and abuts the terrace (Fig. 9). Of similar construction, the rock filled terrace appears to have been built at right angles

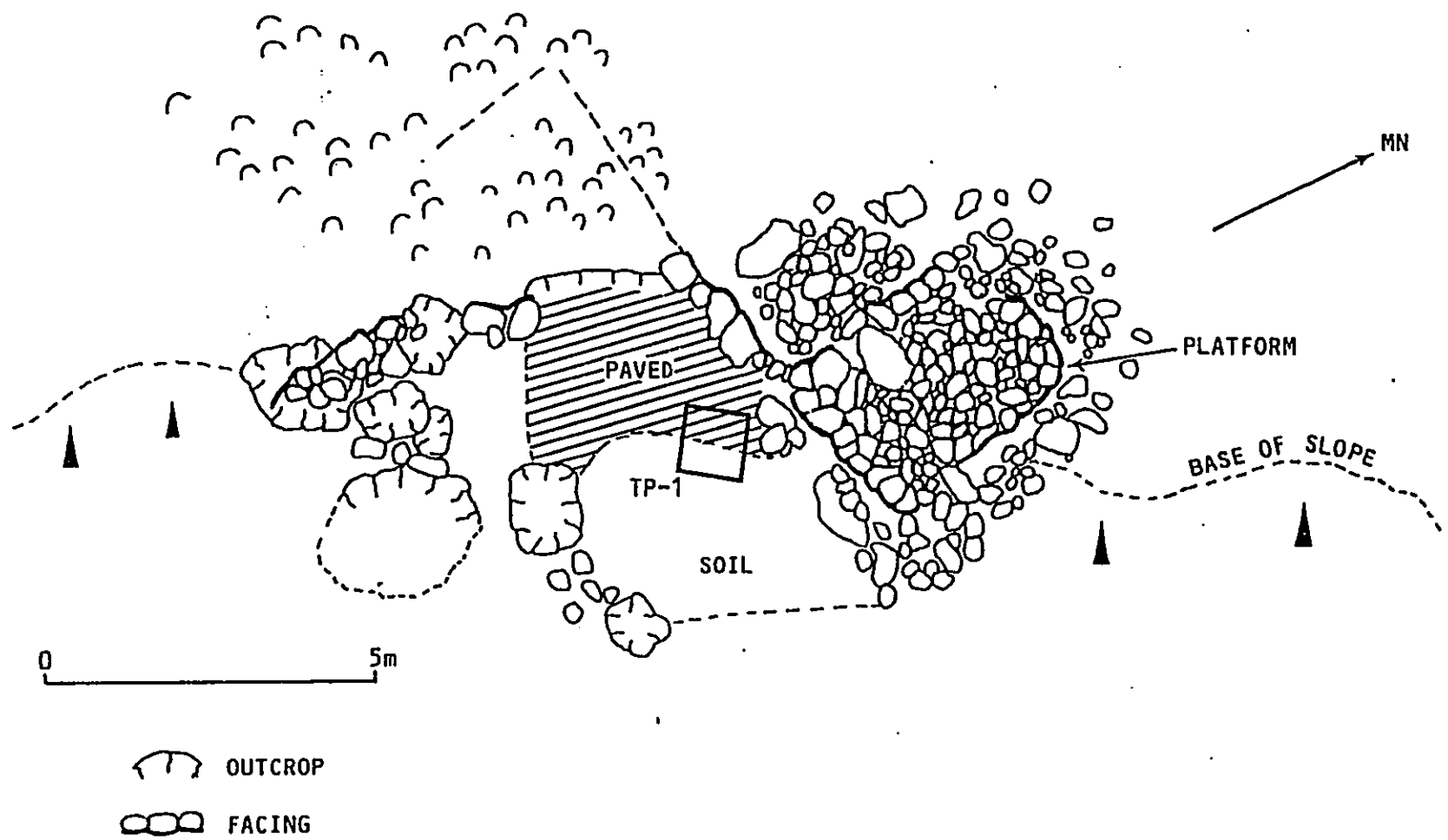


FIG. 9. MAP OF SITE 50-OA-C4-307.

to the platform but has been extensively disturbed. The two segments of stacked stone south of the terrace appear to be of recent construction. Vegetation in the area is dominated by *kiawe* (*Prosopis pallida*), however, *hinahina* (*Heliotropium anomalum* var.) a native to Hawai'i is present.

A 1.0 m by 1.0 m test pit (TP-1) was excavated in the terrace near the intersection with the platform (Fig. 10). Although the terrace fill consists primarily of rock, three sediment layers were observed in the rock interstices above the coral conglomerate bedrock:

Depth	Layer	Description
0-10	O.B.	Overburden consisting of organic material with few sediments; midden, artifact.
10-25	I	10YR 5/2; grayish brown; silt loam; weak, fine crumb structure; clear irregular boundary; midden.
25-40	II	10YR 4/3; brown/dark brown; silt loam; weak, medium crumb structure; clear irregular boundary; midden, artifacts.
40-56	III	7.5YR 5/6; strong brown; silt loam; moderate, medium crumb structure; abrupt smooth boundary; no cultural material.

Seventy percent of the 210.7 grams of shell midden recovered was from Layer II. The shell species represented inhabit nearby shoreline areas. A small amount of fish and mammal bone was also recovered, primarily from Layer II. Three artifacts were recovered from the site, two basalt flakes from Layer II and a coral abrader from the intersection of the overburden and Layer I.

Charcoal sample HRC-967 from Layer II (30 cm B.S.) was analyzed for radiocarbon and an uncorrected age of 520±60 years was obtained. Calibration of this age results in a date range of A.D. 1300-1450.

Discussion

Previous investigations at this site considered two alternatives for interpretation of the platform; human burial or fishing shrine (Kennedy 1986).

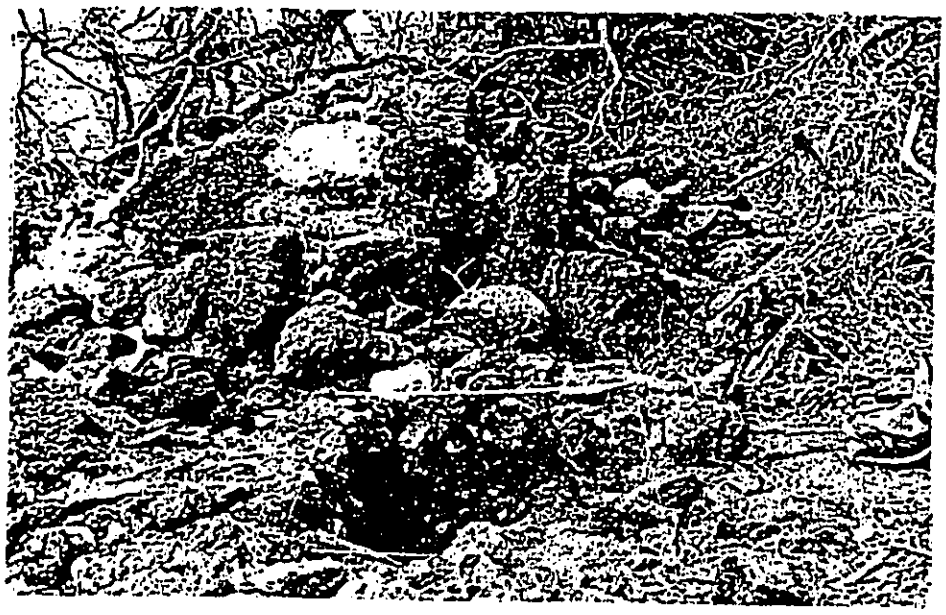


FIG. 10. TP-1 AND PLATFORM (behind TP-1), SITE 50-OA-C4-309. View to Northeast. BPBM Neg. No. Oa(a)366-17.

Since no human skeletal material was found in the interior of the structure, the site was identified as a shrine and reconstructed.

Many sites identified as fishing shrines are platforms that are similar to this site. However, a common attribute for shrines, a surface scatter of coral fragments, is absent from this structure. This may be the result of disturbance to the platform, but because of the recent reconstruction of the structure the extent and nature of past disturbances is difficult to assess.

Although an intact subsurface deposit is present at the site, relatively few artifacts and midden were recovered and it appears that the terrace was used for temporary habitation, in association with the use of marine resources. It is unusual for a shrine and habitation area to be contiguous, so if the platform is a shrine, it is likely that the two structures are not contemporary. Further excavation may establish a sequence of construction.

Site 50-Oa-C4-308

This site is a stacked stone terrace constructed parallel to the base of the boulder strewn, northeast slope of Mauna Lahilahi (Fig. 11). The overall dimensions of the structure are c. 20 m long, 8 m wide, and 1 m high. The vegetation in the area is dominated by *kiawe* (*Prosopis pallida*) and *koa haole* (*Leucaena glauca*).

The exterior facing of the terrace is poorly made and appears to have been recently constructed. Three segments of rock alignments located in the interior rock fill of the site, however, may ~~to~~ predate the recent additions (Fig. 12). A 1.5 m diameter depression is located near the western end of the terrace. Immediately east of this feature the rock surface is evenly paved over an area that measures 4.0 by 1.7 m.

Below the terrace is a surface scatter of lithic material that extends downslope to the road, c. 5 m north of the terrace, and continues on the other side of the road to Site C4-310 (Fig 3). Fine grain basalt flakes, cores, and possible adz blanks are deposited over a sloping area c. 30 m by 30 m, that is interrupted by a roadway. An estimate of 4, per square meter, indicates that over 3,000 artifacts may be present on the surface here. Basalt artifacts similar to these have been recovered from test excavations on the terrace itself and from Site C4-310.

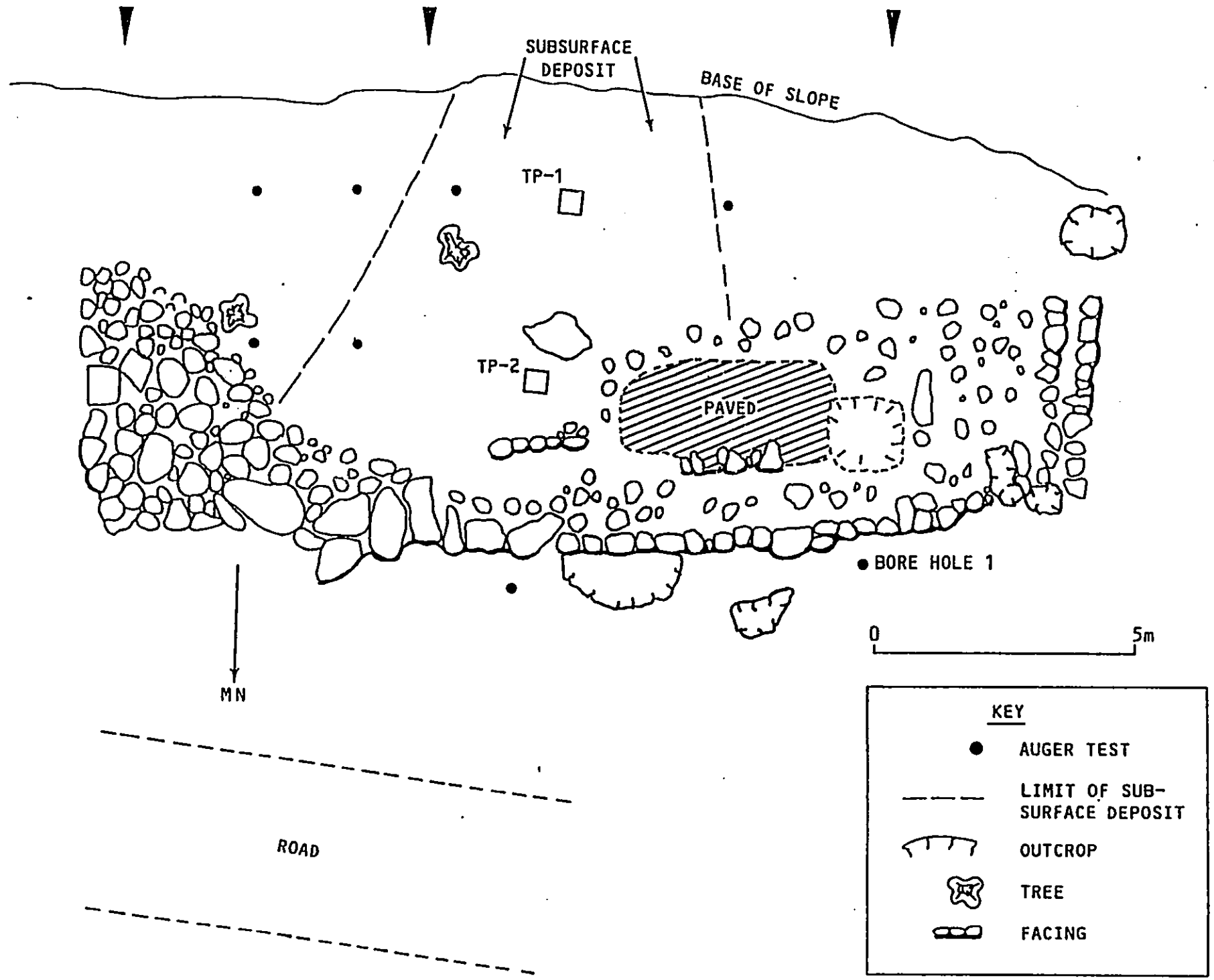


FIG. 11. MAP OF SITE 50-OA-C4-308.

FIG. 12. INTERIOR ALIGNMENT, SITE 50-OA-C4-308. View to West. (Jeff Yamauchi is Standing at Far End of Alignment) BPBM Photo Neg. Oa(a)366-20.

Auger tests in this area did not locate any subsurface cultural deposits so the source of the material is unclear, however, it may be from Site C4-308. This material is presently endangered by erosion, and traffic on the nearby road. The rock fill of the unpaved road is similar to the scatter and is mixing with the scatter along the road edge.

Two 50 cm by 50 cm test pits (TP-1 and TP-2) and six auger tests were placed in the soil deposit immediately behind the terrace, and two auger tests were situated at the base of the terrace. In all of the pits, large boulders underlay the sediment deposits and are considered to be bedrock although sterile sediments were not found. An intact subsurface deposit containing small amounts of midden, artifacts, and charcoal was found in TP-1. Its approximate limits were defined by the series of auger probes and TP-2. The deposit in TP-2 consisted of loose, recently eroded material containing small amounts of midden and two basalt flakes. A dark, very fine grained basalt flake was found on the surface near Auger Test 1.

Under a very thin overburden of organic material, three sediment layers were observed in TP-1. The following layer descriptions are typical for the area.

Depth	Layer	Description
0-15	I	7.5YR 4/4; brown/dark brown silt loam; moderate, medium granular structure; abrupt, smooth boundary; no cultural material.
15-25	II	7.5YR 3/2; dark brown loam; moderate, fine to medium granular structure; clear, smooth boundary; artifact, midden, charcoal.
25-53	III	5YR 3/2; dark reddish brown clay loam; moderate fine subangular structure; clear, wavy boundary; artifact, midden, charcoal.

Feature A, located at the southwest corner of the test pit may be a posthole (Fig. 13). The feature is c. 10 cm in diameter and c. 15 cm deep is intrusive into Layer III and is filled with rock and Layer II material.

Few artifacts and sparse midden were recovered from Layers II and III. The midden consists of 0.7 grams of fish bone, 0.5 grams of marine shell, 4.6 grams

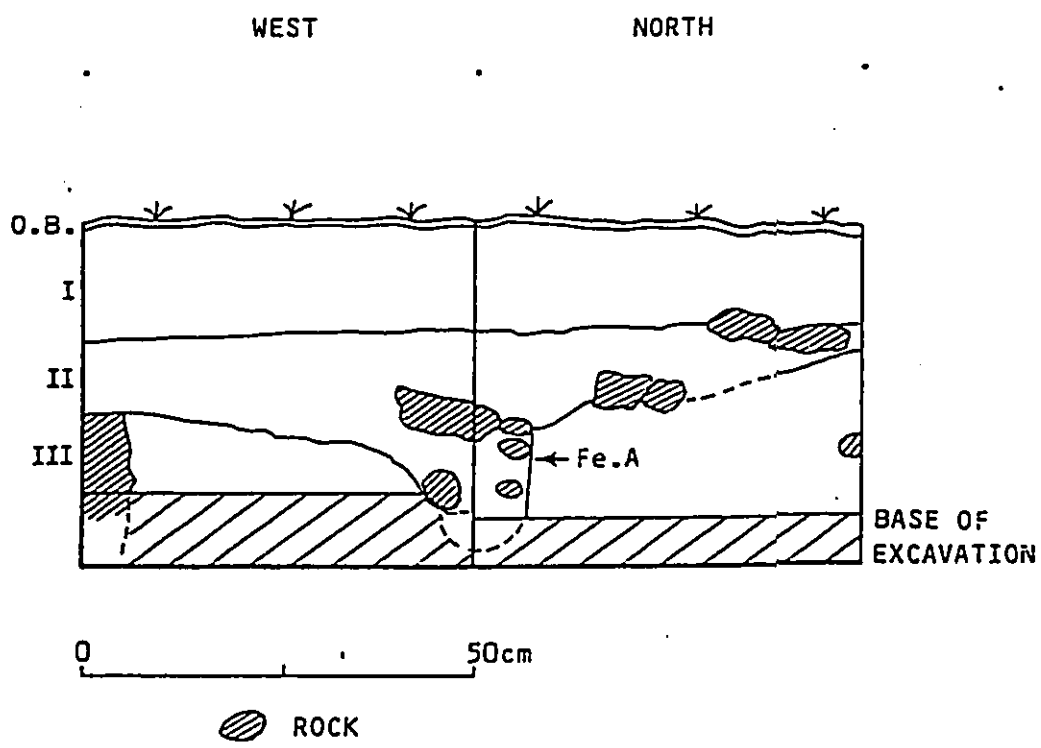


FIG. 13. PROFILE OF NORTH AND WEST FACES, TP-1, SITE 50-OA-C4-308.

of mammal bone, and 0.1 grams of *kukui* shell (*Aleurites mollucana*). Two basalt flakes, one each from Layers II and III were recovered.

A charcoal sample from Layer III (HRC-968) was analyzed for radiocarbon and the uncorrected age of 380±50 years was obtained. Calibration gives a calendrical date range of A.D. 1450-1650 for this sample.

Discussion

Although this site has been disturbed by recent activity, an intact cultural deposit with a possible posthole feature was located and additional subsurface features may be present. The structure is spatially associated with a basalt flake deposit located on the surface immediately downslope. It is likely, based on the large amount of material present on the surface, that stone tools were being manufactured in this area.

Site 50-Oa-C4-309

This site is a boulder outcrop that has been modified with two, crudely made terrace walls. Located at the base of the northeast slope of Mauna Lahilahi the structure is 9.0 m long, 3.2 m wide, and 1.45 m high (Fig. 14). Constructed of angular basalt stones that average 40 cm in size, the stacked stone walls slope up towards the outcrop and boulder face. Extremely large boulders (c. 1.5 m diameter) are located throughout and on top of the structure, and the walls have been constructed around them (Fig. 15). No artifacts or midden were observed on the surface.

Four auger tests at the base of the outcrop and two at the top were performed to test for subsurface deposits. No midden, artifacts, charcoal, or cultural material of any kind was found.

Discussion

Since no deposits or cultural materials of any kind were found it is difficult to interpret the site in terms of chronology and function. A local informant states that the site was originally constructed c. A.D. 1935 as a boundary wall and was later used to store large boulders. The crude form of the terrace is consistent with this information.

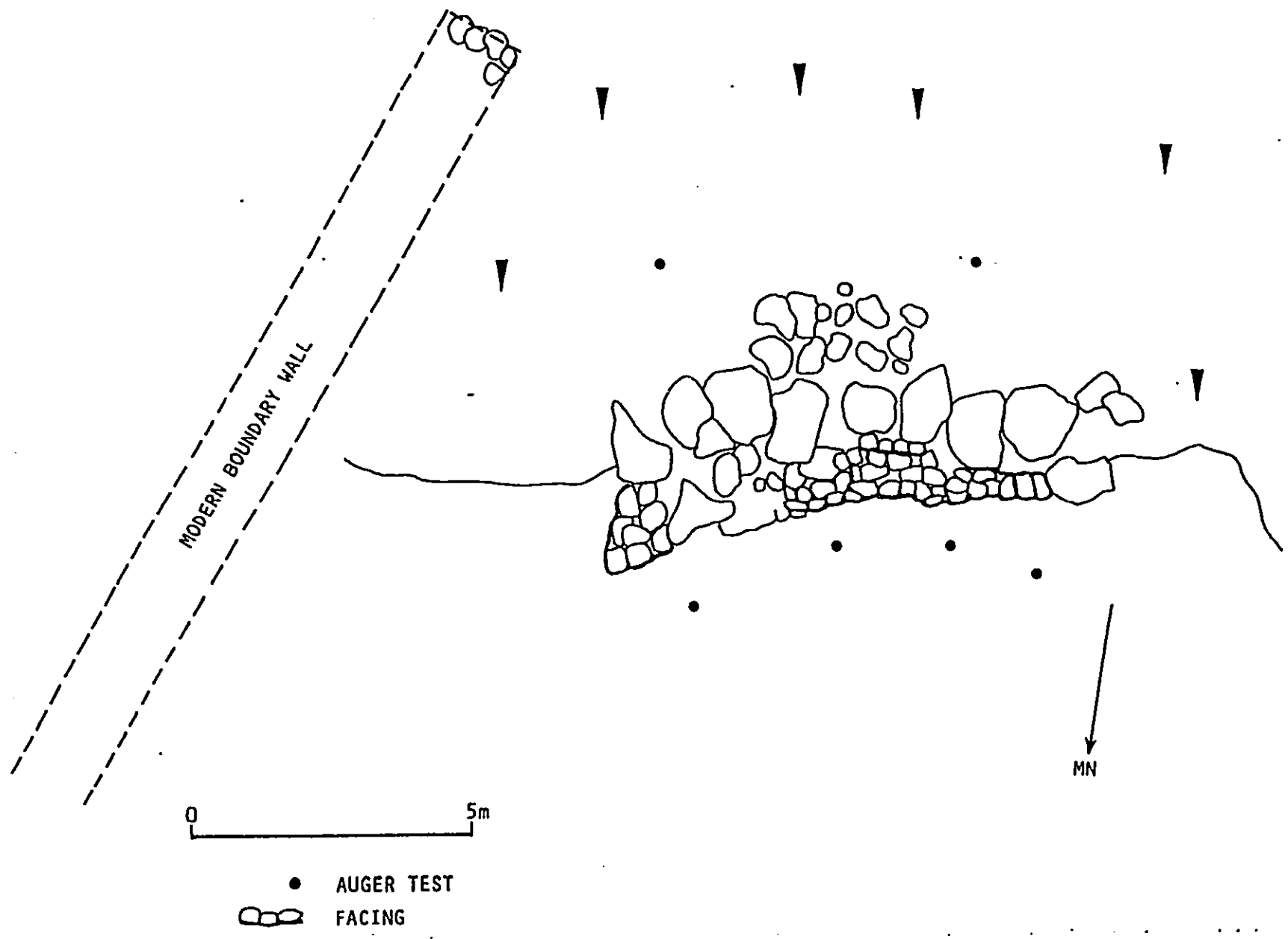

MODERN BOUNDARY WALL
MN
0
5m
AUGER TEST
FACING

FIG. 15. VIEW OF SITE 50-OA-C4-309. View to South.
BPBM Neg. No. Oa(a)366-24.

Site 50-Oa-C4-310

This site is a well preserved parallelogram-shaped, walled enclosure with corner angles measuring 98 and 82 degrees (Fig. 16). The outside measurements are approximately 12.5 m by 17.5 m and wall heights average about 80 cm. The north, east and south walls are constructed of stacked, angular basalt and coral conglomerate stones (average size - 40 cm). The west wall is core-filled (cobble fill), and constructed of similar material. A 1.25 m break in the walls of the structure is located at the southwest corner and appears to have been constructed (Fig. 17). The interior surface of the enclosure consists of clayey sediments with small exposures of bedrock (coral conglomerate), boulder rubble and areas disturbed by uprooted trees.

A large amount of modern debris is present inside the enclosure and includes wire screen, metal cables, and recent bottles, however, no early historic material was noted. The vegetation in the site consists of large *kiawe* (*Prosopis pallida*), *koa haole* (*Leucaena glauca*) and various grasses. This area is presently maintained as part of the landscaped garden and a large variety of ornamental plants are present.

The surface scatter of lithic material associated with Site C4-308 extends to the southern and western border of this site and similar material is present inside the enclosure, but at a much lower density. Four artifacts were recovered from the interior surface of the enclosure; three basalt flakes and a quadrangular adz blank from the vicinity of the entryway, and a basalt core from the northwest, interior corner. Two artifacts, a coarse grained basalt hammerstone and a small grindstone (maximum length -15.0 cm), were found on the enclosure wall adjacent to the test pits.

Two, 1.0 m by 1.0 m test pits (TP-1 & TP-2) were excavated inside the ~~the~~ enclosure, 2 m from the entry. Under a thin (2 cm) layer of organic overburden, two sediment layers were observed in both test pits:

Depth	Layer	Description
0-15	I	10YR 3/2; very dark gray, silty clay loam; strong, medium/coarse crumb structure; sticky and plastic; sparse midden, charcoal, basalt flakes, bottle glass, round metal nails.
15-44	II	7.5YR 3/2; very dark gray, clay; strong, coarse angular structure; sticky and plastic; smooth, wavy boundary; midden, basalt flakes.

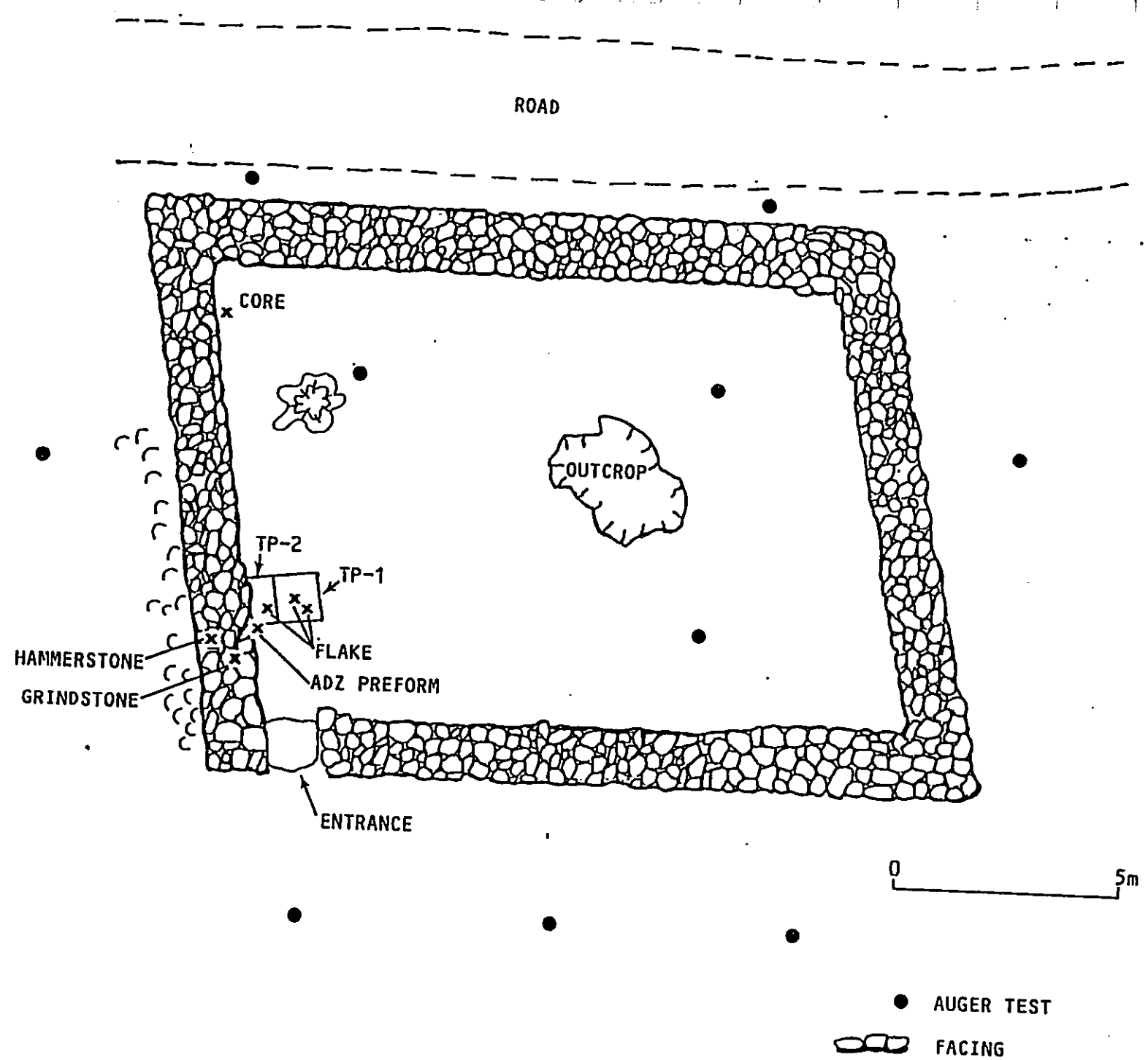


FIG. 16. MAP OF SITE 50-OA-C4-310.

FIG. 17. ENTRANCE TO ENCLOSURE, SITE 50-OA-C4-310.
View to North. BPBM Neg. No. Oa(a)364-16.

FIG. 18. INTERIOR OF WEST WALL AND TP2 SITE
50-OA-C4-310. BPBM Neg. No. Oa(a)364-29.

Layer I is a silty clay loam that contains a mixture of prehistoric and modern, midden and artifacts. The prehistoric-type material consists of four basalt flakes, a small amount of midden material (16 grams of marine shell and 1.6 grams of mammal bone) and a human incisor. Both types of material (prehistoric and modern) are deposited throughout the layer, indicating intense disturbance. A local informant indicates that the enclosure was used as an animal pen c. 1930 and this would be consistent with the findings.

Layer II is a blocky clay that appears to be related to the Waialua Clay Series that is present at the mouth of Makaha Valley. If this is true this layer may be the remnant of more extensive deposits that were extant earlier in the geologic sequence. Two basalt flakes and a small amount of shell midden (13.3 grams) were recovered from this layer.

A charcoal sample (HRC-966) from this layer (18 cm b.s.) was analyzed and a corrected (013/012) age of 110±60 was obtained. Unfortunately, the calibrated date range at one and two standard deviations extends to the present (A.D. 1650 - present) and can only be used for a "no older than" date.

TP-2 was excavated at the base of the enclosure wall and it appears that the wall was constructed subsequent to the formation of Layer I (Fig. 18). A mixture of material from both Layers I and II is present under basal stones of the wall and Layer I fills the interstices.

Three auger tests in the interior of the enclosure and seven outside, were situated to detect variations in the sediment deposition of the area and establish the geologic context of the two test pits. The deposits found were very similar to Layers I and II. These clay deposits are of limited extent and found only in the vicinity of this site, the upper portion of Transect 2 and the vicinity of Transect 3.

Discussion

The artifacts and midden found in Layers I and II and on the surface, show that prehistoric activity occurred in and/or nearby the site. With regard to the structure itself, the present data indicates that it may be of recent origin. However, the excavations were of limited extent and since two techniques

of wall construction are exhibited in the structure, the data is not conclusive with respect to the chronology.

Site 50-Oa-C4-311

Located at the base of a sheer rock cliff, this site is a low terrace situated between the cliff and a large boulder (Fig. 19). The terrace is 2.2 m long, 50 cm high and constructed of angular basalt stones with an average size of 30 cm. No midden or artifacts were found on the surface. Three auger tests were done, but no subsurface deposit was found in the shallow deposit of sediments.

A very shallow rock overhang with no sediment deposit is located in the cliff face, 1.0 m southeast of the terrace. Although it is not large enough for an adult to sit in, two fish vertebrae, and a *pipipi* shell were found in the shelter. Immediately downslope of the overhang, two basalt flakes were found on the surface. The very shallow sediments present in the overhang were examined but no cultural deposit was present.

Discussion

The artifacts and midden found at the site indicate that it is associated with prehistoric activities and the terrace may have been a planting area.

Site 50-Oa-C4-312

This site is a footpath that partially encircles Mauna Lahilahi (Fig. 4). One end of it begins near Site C4-306, at the base of the slope and continues west towards the end of the point. The portion of the trail between Sites C4-306 and C4-307 has been cleared of debris, is c. 1.5 m wide and is located near the base of a steep slope. This part of the trail has been modified and maintained in recent times (local informant). A considerable amount of modern debris is strewn about this area.

The trail continues from Site C4-307 towards the point where the terrain becomes very steep and crosses a rough talus slope. In this area the trail is very narrow (c. 0.5 m), winds around rock outcrops and has disappeared in many places. Near the end of the point the trail is situated at the edge of a steep cliff and recent modifications include the construction of cement steps.

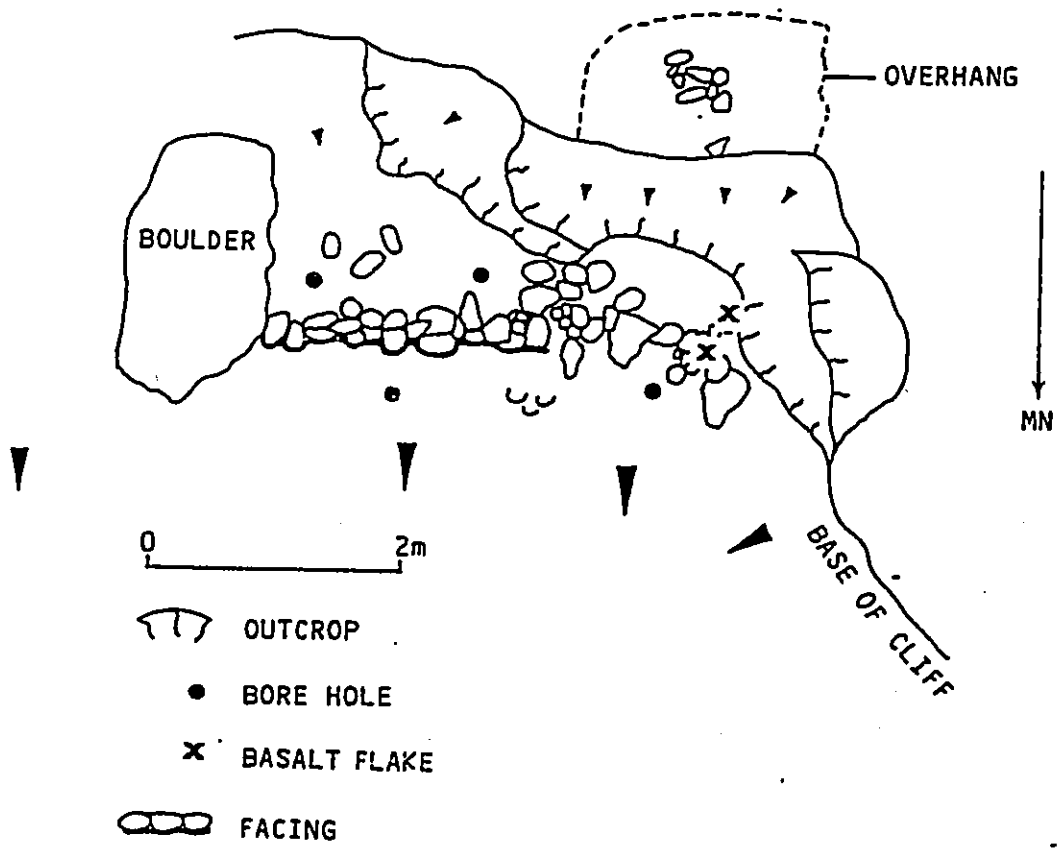


FIG. 19. MAP OF SITE 50-OA-C4-311.

The trail continues around the point at an elevation of c. 12 m a.m.s.l. and crosses Site C3-25 (rockshelter). It continues east along the top of a steep talus slope that rests against a bare rock cliff, eventually reaches site C3-32 (midden deposit) and ends at the rock outcrop where the petroglyph site is located (C3-26).

Discussion

None of the early historic maps reviewed for this project show the existence of this trail, however, a local informant states that it was traditionally used for access to the marine resources available at the point and that a "high" trail and a "low" trail were discussed in conversations with other residents of the area.

AREA B

Site 50-Oa-C3-25

This site is a rockshelter situated near the seaward end of Lahilahi at an elevation of about 15 m and is perched at the top of a very steep talus. The floor of the shelter is level, 8 meters deep from the back of the overhang to the edge of the talus, and about 10 meters wide (Figs. 20 and 21). The sloping ceiling is very high and is about 3.5 meters high near its center. Inspection of the surface of the shelter revealed no artifacts, midden, nor any surface structures indicating prehistoric-type activities. Although no vegetation is growing in the shelter itself, the vegetation outside the dripline consists of *koa haole* (*Leucaena glauca*) and various grasses. A modern fireplace has been constructed near the back of the site and a foam mattress, aluminum beer cans, and similar debris indicate very recent use.

Excavation

A 1.0 by 1.0 m test pit (TP-1) was situated approximately one meter from the back of the shelter. After the first two layers of disturbed sediments were removed, the west half of the pit was excavated to a depth of about 1.5 meters. Two auger tests extended the total depth of excavation to 1.65 meters, however, the substrate was not reached.

Below a thin (2-3 cm) layer of overburden, ten sediment layers were observed during the excavation (Fig. 22, 23). Average depths, and descriptions of

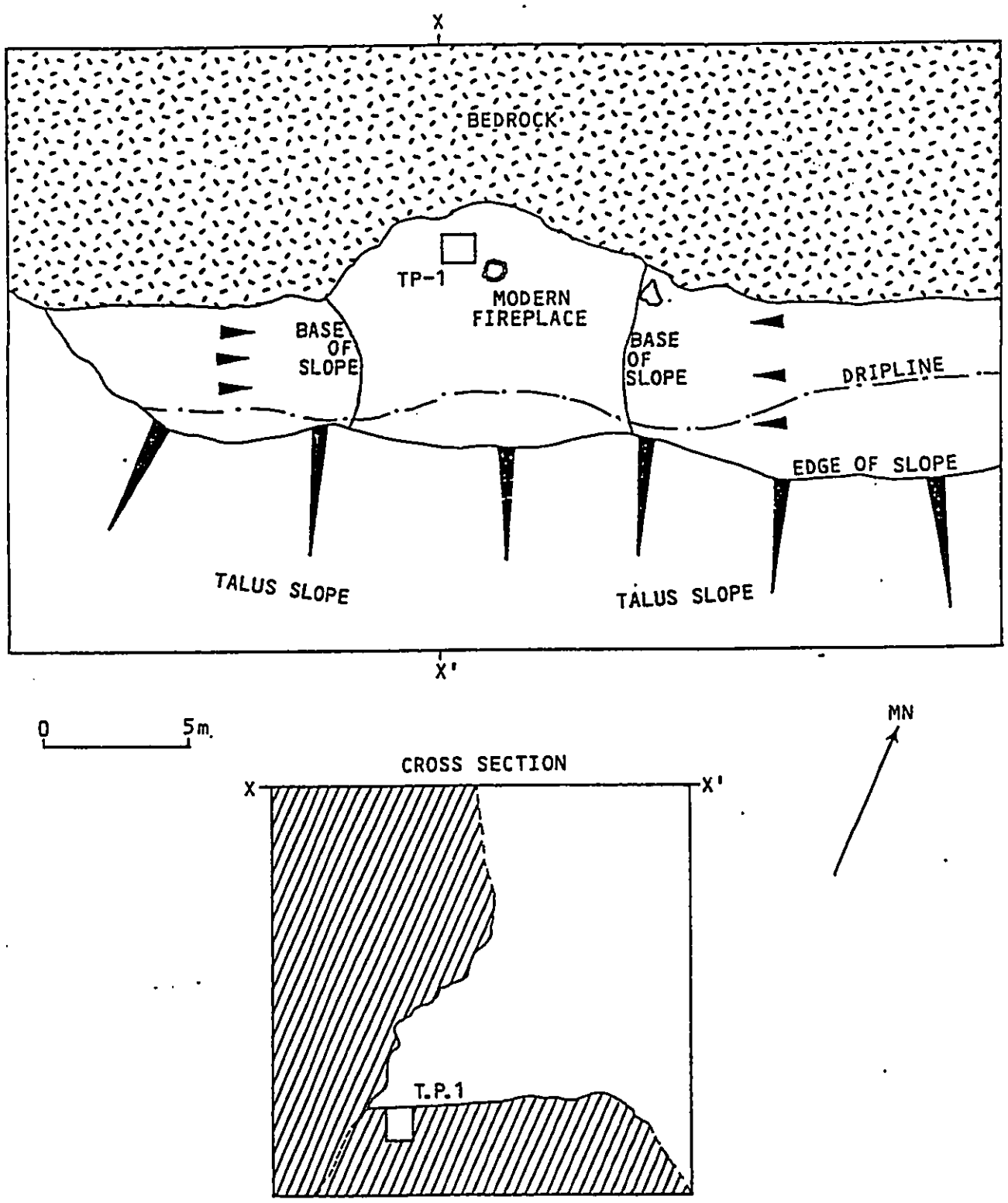


FIG. 20. MAP OF SITE 50-OA-C3-25.

FIG. 21. VIEW OF SITE 50-OA-C3-25. View to West.
BPBM Neg. No. Oa(a)366-8.

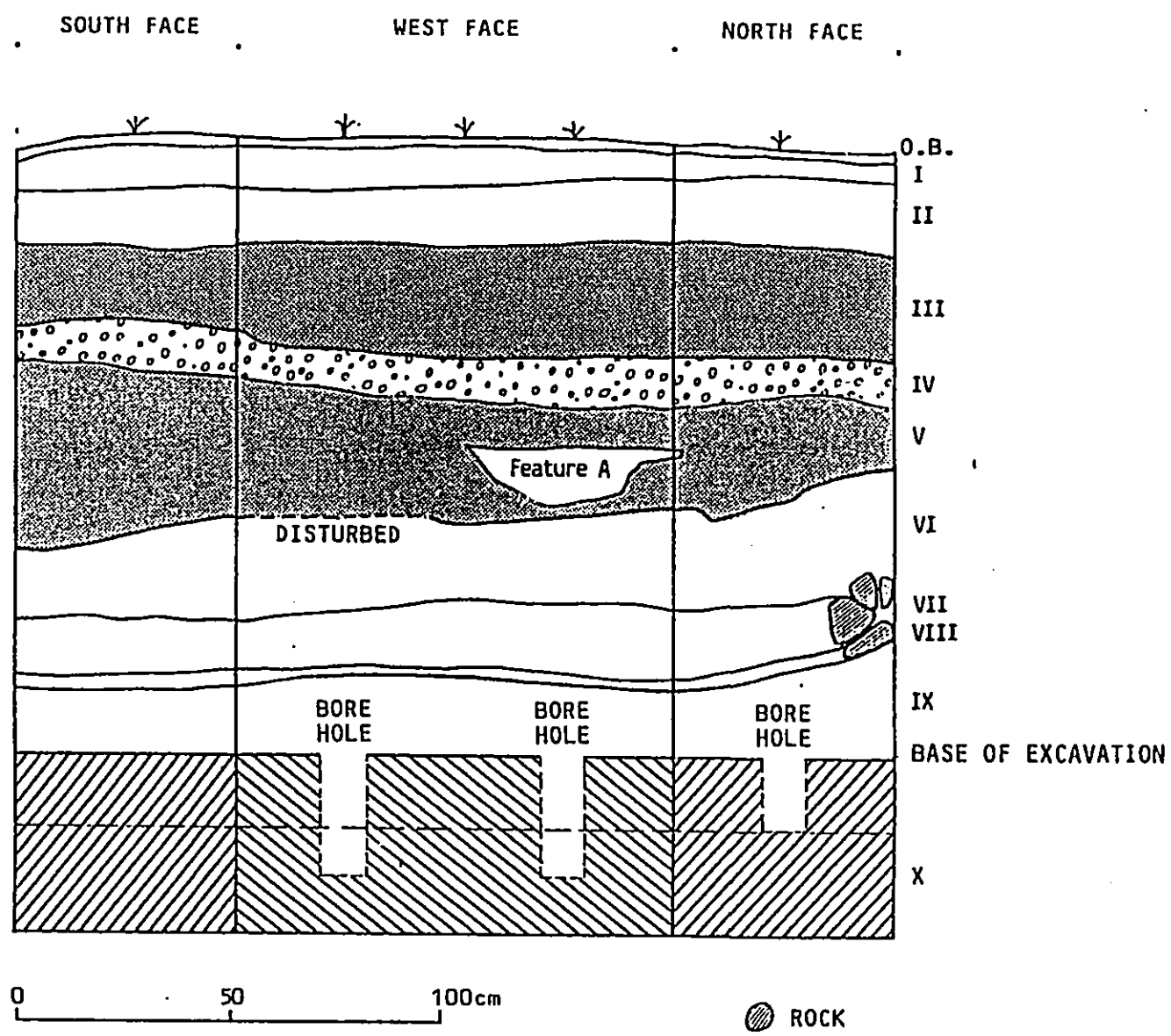


FIG. 22. PROFILE OF TP-1, SITE 50-OA-C3-25.
West, north and east faces.

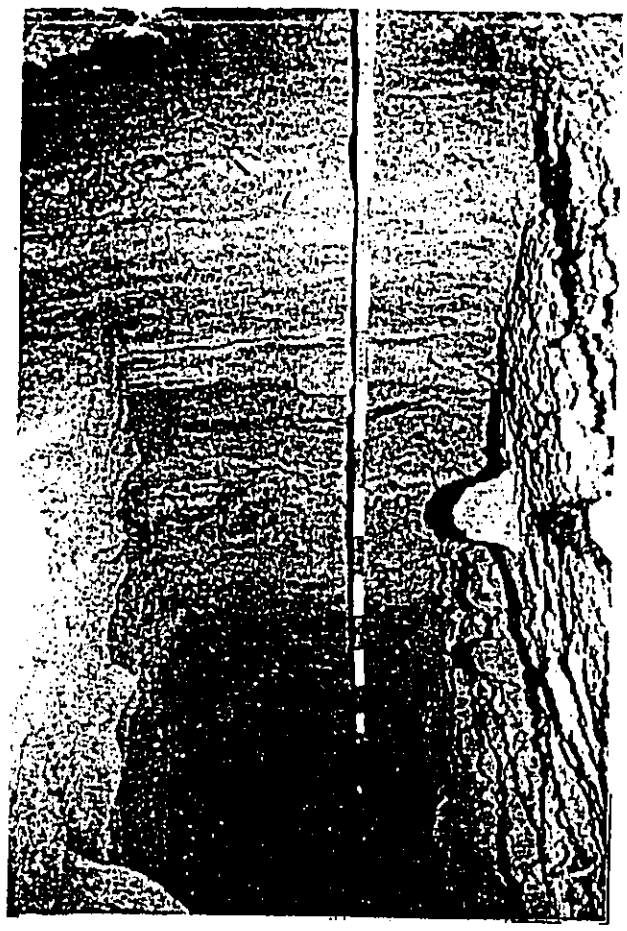


FIG. 23. WEST FACE, TP-1, SITE 50-OA-C3-25.
View to West. BPBM Neg. No. Oa(a)365-28.

FIG. 24. FISHHOOK FROM TP-1, SITE 50-OA-C3-25.
(illustration by Bonnie Froman)

each layer are presented in Table 2. Layers III, IV and V contained prehistoric-type midden material, however, Layer V contained the only substantial feature found, although numerous ash and charcoal lenses occur throughout the deposit. Feature A in Layer V is a 15 cm deep pit containing large amounts of charcoal, ash, midden and three artifacts. Although no ash or charcoal lenses were found in this feature, it may have been a fire pit. The material from the excavations was remarkably well preserved and even organic material (plant fiber) was recovered from Layer V.

Table 2
Site C3-25, TP-1 Stratigraphy

Depth (cm)	Layer	Description
0-3	O.B.	10YR 4/4; dark yellowish brown silt; gravel, sand; disturbed by recent use as campsite.
3-9	I	10YR 4/6; dark yellowish brown silty clay loam; weak, platy structure; abrupt, smooth boundary; goat dung, charcoal, bottle glass, other historic material.
9-23	II	10YR 5/3; brown sandy, clay loam; weak, fine crumb structure; sediments interstitial in dense cobble; white carbonate precipitate present; abrupt, smooth boundary, shell and bone midden, charcoal, bottle glass, other historic material present.
23-46	III	10YR 5/4; brown silty clay; weak, thin, platy structure; layer comprised of numerous layers of thin (3 cm), platy, bands of brown (10YR5/3) and dark brown (10YR 4/3) sediments; few cobble present; abrupt smooth boundary; shell and bone midden, charcoal, prehistoric-type artifacts.
46-62	IV	10YR 5/3; brown silty clay; weak, thin, platy structure; increase in cobble; abrupt, smooth boundary; shell and bone midden, less charcoal.
62-83	V	10YR 5/3; brown silty clay; weak, thin platy structure; abrupt smooth boundary; numerous lenses of charcoal and ash, shell and bone midden, artifacts.
83-101	VI	2.5Y 5/2; grayish brown sandy loam; weak, thin platy structure; abrupt sloping boundary; no cultural material.

Table 2 (continued)

Depth (cm)	Layer	Description
101-116	VII	10YR 5/3; brown sandy loam; structureless; abrupt sloping boundary; no cultural material.
116-119	VIII	10YR 5/2; grayish brown sandy, clay loam; structureless; abrupt sloping boundary; no cultural material.
119-150	IX	10YR 5/3; brown sandy loam; structureless; cobble and gravel present; no cultural material.
150-165	X	7.5YR 5/4; brown silty clay; structureless; boulders present; no cultural material; base of excavation in this layer.

The total amount of marine shell and bone midden recovered from the 1/4 inch fraction of these three layers was 2810.7 grams with c. 75 percent of this total from Layer V (Table 3). Although a wide range of gastropods are represented, *pipipi* (*Nerita* sp.) is the most common in all layers (59 percent). Also found in relatively large numbers are *opihi* (*Cellana* sp.), cowrie (*Cypraea sp.*), and drupe (*Drupa* sp.). All these shell species inhabit the shoreline areas adjacent to the site. Ninety five percent of the fishbone came from Layer V as did most of the other bone material, although a large fragment of human bone (humerus) came from Layer IV.

Six prehistoric-type artifacts were recovered from Layer III; four basalt flakes, a pencil urchin spine abrader, and a volcanic glass flake. The 36 artifacts from Layer V include; 24 basalt flakes, two calcite flakes, seven coral abraders, two pieces of worked mammal bone, and the shank of a one-piece jabbing fishhook with an internal barb (Fig. 24). The three artifacts from Feature A, consist of two coral abraders, and a basalt flake. No prehistoric-type artifacts were recovered from other layers. Basalt flakes are the most numerous artifact, however, most of the artifacts for which functional interpretations can be made appear to be associated with fishing activities. The small coral abraders (the largest of which is 3.0x2.96x1.8 cm) and pencil urchin spine may be associated with the manufacture and maintenance of fishhooks. These fishing related activities are also represented in the assemblage, by the pieces of worked bone. The calcite flakes do not exhibit evidence of use-wear and there may be a possibility that they are debitage from tool manufacture, however, the present data is very limited with respect to sample size.

Radiocarbon Analysis

Two charcoal samples (HRC-970 & 971) were analyzed for radiocarbon. HRC-970, from the top of Layer IV (46-47 cm B.S.) and HRC-971 from the bottom of Feature A in Layer V (83 cm B.S.). Unfortunately, the statistical error associated with HRC-970 is very large (uncalibrated radiocarbon age - 260±160 years) and the calibrated calendrical date range at two standard deviations is from A.D. 1325 to the present. However, for HRC-971 the uncalibrated radiocarbon age is 440±70 and the calibrated date range is A.D. 1325-1650.

Table 3.
Midden Site 50-Oa-C3-25, TP-1

Taxon	I	II	III	IV	V C	TOTAL
Bivalvia	-	-	12.5	8.0	22.3	42.8
Gastropoda						
Cellana sp.	+	2.0	15.7	5.2	217.5	240.4
Conus spp.	-	-	1.0	13.1	18.9	33.0
Cypraea spp.	-	0.2	26.3	17.3	196.8	240.6
Drupa spp.	-	1.3	43.6	51.4	316.1	412.4
Nerita sp.	-	4.2	277.3	114.2	1256.5	1652.2
Littorina sp.	-	-	3.0	5.7	39.7	48.4
Echinoderm	+	0.1	4.1	19.6	33.9	57.7
Chitonidae	-	-	0.8	-	0.2	1.0
Teredinidae		-	-	-	9.4	9.4
Unidentified	+	-	7.6	9.3	63.7	80.6
TOTAL		7.8	391.9	243.8	2175.0	2818.5
Crustacean	-	-	-	-	0.6	0.6
Human bone	-	-	-	14.5	-	14.5
Mammal bone	-	-	0.8	-	3.1	3.9
Mammal tooth	-	-	-	3.4	0.2	3.6
Fish bone	-	-	0.6	1.9	39.0	41.5
Bird bone	-	-	-	-	0.6	0.6
Unidentified bone	-	-	0.3	-	-	0.3
Aleurites mollucana	-	0.4	-	-	-	0.4
Fibrous material	-	-	-	-	+	

+ presence - absence

Discussion

The amount and condition of the material recovered from this very small test excavation indicates that a very substantial and well preserved deposit is

inferences can be tentatively made. It appears that there were two main periods of occupation, represented by Layers III and V, both associated with use of marine resources. Decreasing amounts of midden and charcoal and the absence of artifacts from Layer IV may indicate a hiatus. The dense midden and numerous artifacts deposited during the initial occupation of the site (Layer V) indicate a relatively long term of occupation in comparison with Layer III. The smaller amounts of midden and fewer artifacts deposited in Layer III may reflect a change in occupation pattern to intermittent.

Site 50-Oa-C3-26

This site consists of 26 petroglyphs located on the rock faces of an outcrop located near the southeast boundary of the study area and measures c. 20x20m. Three additional figures were found but are not of identifiable form. Seventeen are anthropomorphic and are recognizably human while nine appear to be animals. All of the human figures are roughly triangular and the animal figures appear to be dogs (Fig. 25, 26), although one may represent a cow or goat (Fig. 27). No linear forms are represented. Most of the figures have a maximum length of 20 to 30 cm but the range is from 8 to 67 cm.

Modern graffiti has been painted and inscribed on many of the rock surfaces and three of the petroglyph figures are crudely made and may be recent. All of the figures were sketched and located.

Discussion

These petroglyphs are similar to figures found at other sites in Hawai'i. The only site where a relationship between chronology and stylistic change in petroglyph forms has been proposed, is on the island of Hawai'i. Research at the Hilina Pali site indicates that there was a stylistic change in human figure petroglyphs at about A.D. 1600. Human figures carved when the cave was first occupied (circa A.D.1600) are dominated by linear figures (80%), with few open-bodied (10%) and triangular figures (10%). Based on inferential data a hypothesis that there was a subsequent change in preference for triangular forms as opposed to linear figures, was proposed, however, further research was considered to be necessary (Cleghorn 1980).

Since the human petroglyphs forms found at this site are all triangular, the work at the Hilina Pali site indicates that they were probably made sometime after A.D. 1600.

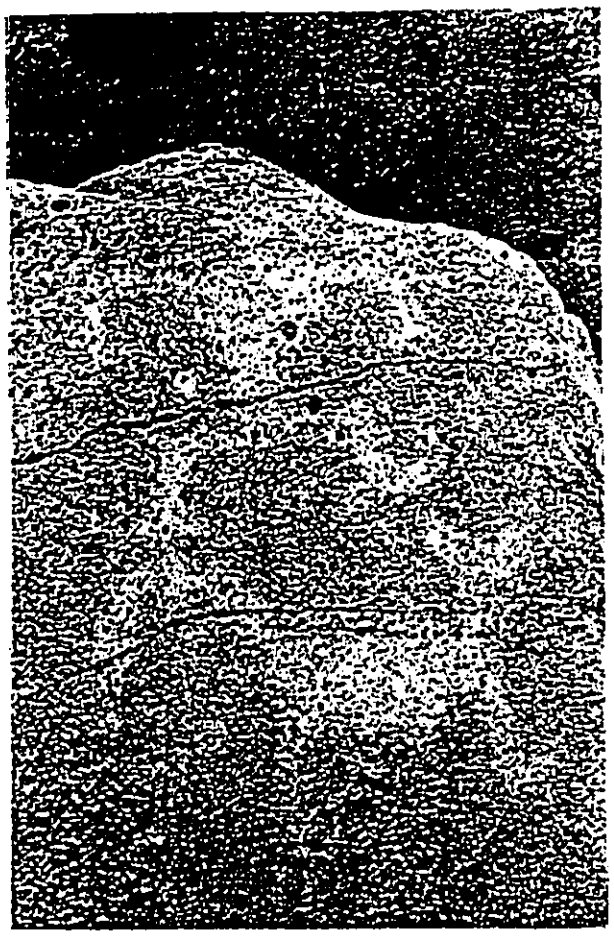


FIG. 25. DOG AND HUMAN-FORM PETROGLYPHS, SITE 50-OA-C3-26 (Panel 5). View to North. BPBM Neg. No. Oa(a)366-32.

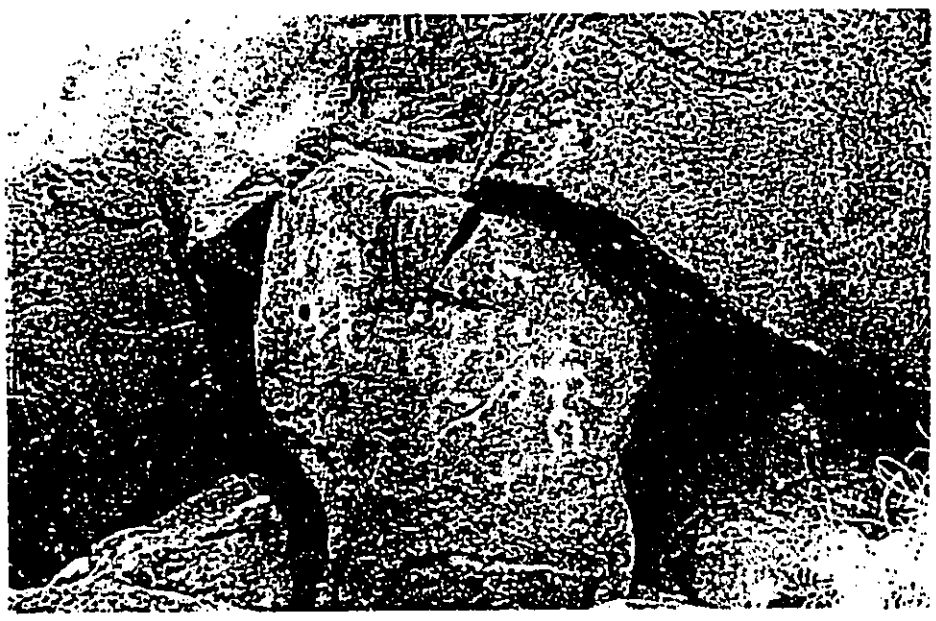


FIG. 26. THREE HUMAN-FORM PETROGLYPHS, SITE 50-OA-C3-26 (Panel 1). View to West. BPBM Neg. No. Oa(a)366-31.

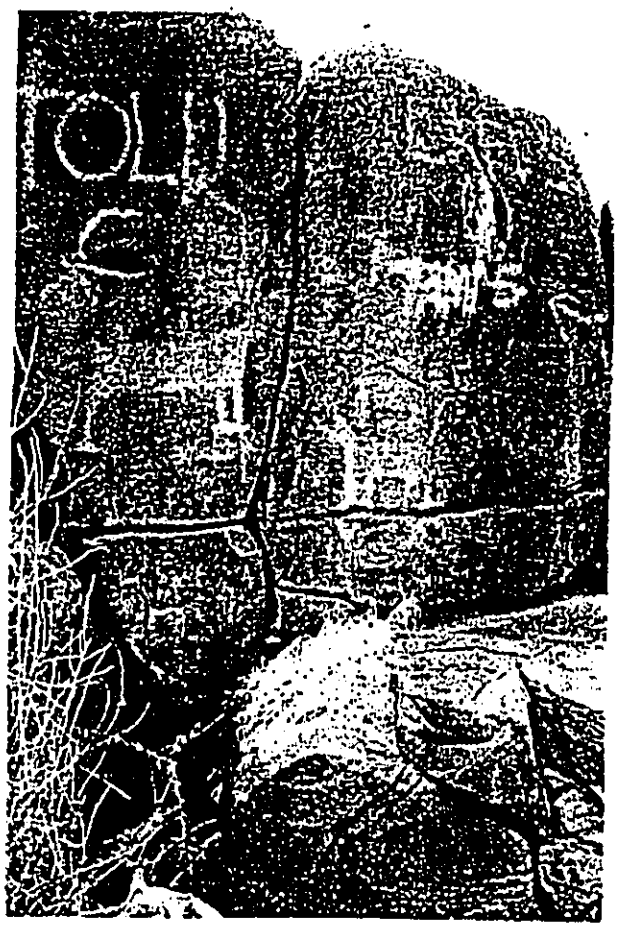


FIG. 27. GOAT OR COW (left), HUMAN (lower left), and TWO, DOG-FORM PETROGLYPHS, SITE 50-OA-C3-26 (Panel 4). View to North. BPBM Neg. No. Oa(a)366-34.

Site 50-Oa-C3-27

This site is a rectangular enclosure located at the base of the steep talus on the south coast of the study area. The coast in this area is very narrow (c. 30 m wide) and is exposed to high wave action. The east and north wall are fairly well preserved while the west and south wall are badly disturbed (probably by wave action) and consist of concentrations of stone rubble (Fig. 28). The overall dimensions of the structure are c. 11.0 by 10.0 m. The walls are constructed of stacked, waterworn and angular basalt stones, and coral conglomerate (average size - 40 cm). Wall heights are c. 1.1 m for the east wall (Fig. 29) and 30 cm for the north wall. Vegetation in the area consists of dense *kiawe* (*Prosopis pallida*) and various grasses. Modern debris such as beer bottles and pieces of plastic are present on the surface, and a recently built stone alignment has been built next to a large boulder on the wave swept shoreline near this site.

The interior of the structure is very badly disturbed but there appears to be three levels that start from ground level at the south and continuing north as two terrace/platforms c. 50 cm high. No prehistoric type midden was found on the surface, however, a large basalt core was collected from the surface of the terrace area.

A 50 by 50 cm test pit (TP-1) was excavated in the level area at the southern end of the enclosure. The upper layers appeared to have been disturbed but Layer II was intact and contained a small amount of midden and charcoal.

Depth	Layer	Description
0-5	O.B.	Overburden consisting of organic material.
5-10	I	7.5YR 3/2, dark brown, silty coral sand, structureless; glass fragments, metal, other modern debris.
10-27	II	5YR 2.5/2, dark reddish brown, silty coral sand; weak, medium crumb structure; smooth, abrupt boundary; midden and charcoal.
27-56	III	7.5YR 7/4 reddish yellow, well sorted, coral sand; weak crumb structure; wavy, abrupt boundary; no cultural material.

The total shell midden from Layer II weighed 39.7 grams, 34 grams of which were made up of two pieces of shell (*Conus* sp. and *Periglyta* sp.) although

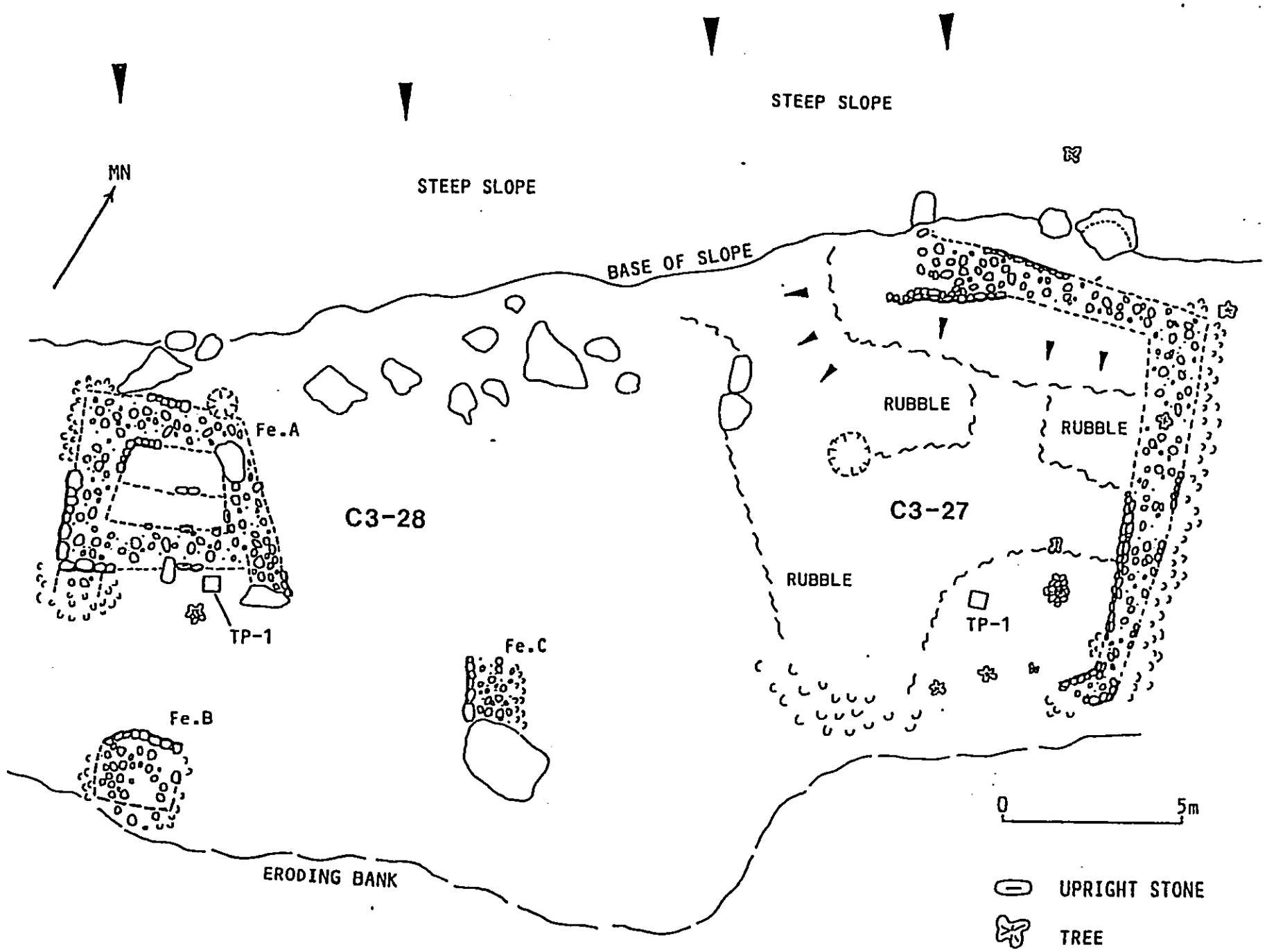

STEEP SLOPE
STEEP SLOPE
MN
BASE OF SLOPE
Fe.A
C3-28
TP-1
RUBBLE
RUBBLE
C3-27
RUBBLE
TP-1
Fe.C
Fe.B
0
5m
ERODING BANK
UPRIGHT STONE
TREE

FIG. 29. EAST WALL, SITE 50-OA-C3-27.
View to East. BPBM Neg. No. Oa(a)365-2.

bivalves were represented as were cowrie (*Cypraea* sp.), *pipipi* (*Nerita* sp.), and sea urchin (Echinodermata). Fishbone from the midden weighed 0.5 grams.

A charcoal sample collected from Layer II (22-27 cm B.S.) was analyzed for radiocarbon and age of 450±80 years was obtained. The calibrated date range for the sample is A.D. 1300-1650.

Discussion

Although the surface features of this site have been extensively disturbed sufficient data is available to make tentative interpretations regarding site function. The complex internal features of the structure, the small amount of midden and artifacts, and its large size, suggest that it may be a religious structure, or specialized structure such as a men's house, rather than a habitation site.

Site 50-Oa-C3-28

This site consists of three features (Fe A, Fe B, and Fe C) located c. 15 m west of Site C3-27. Fe A is a small quadrangular structure that measures c. 6.0x5.0 m (Fig. 28). The exterior of the site is defined by low (10-20 cm) pavements or wall foundations c. 50 cm wide that are constructed of coral conglomerate and basalt stones with an average size of 30 cm. A similar pavement, almost at ground level, is located at the north end of the structure. There is very little rubble in the vicinity of the structure and it appears to be relatively intact, however, the east and west borders may have extended further south. A 50x50 cm test pit (TP-1) was excavated near the south end of Fe A. No artifacts, midden, or charcoal was observed and the deposit consists primarily of coral sand and organic materials.

Fe B and Fe C are concentrations of stone rubble (average size 30 cm) with stacked stone facings along one side, located south and southeast of Fe A. Fe B is roughly rectangular, measures 2.0x2.5 m and is 75 cm high. Fe C is also rectangular, built against a large boulder 1.5x1.7 m and is 40 cm high.

No artifacts or midden were found on the surface of any of the features, however, branch coral is common on the surface of Fe A. The vegetation is the same as Site C3-27.

Discussion

Although the data concerning these structures is very limited, the branch coral found on Fe A suggest that it may be associated with religious activity and that it may be a shrine. In this context Fe B and Fe C may be badly disturbed cairns.

Site 50-Oa-C3-29

This site is a walled rectangular enclosure situated at the base of a talus slope and located approximately 25 m west of site C3-28 (Fig. 30). The south wall is badly disturbed and only rubble remains. The overall length of the east and west walls is about 12.0 m, however, 6.0 m from the north wall, they both make a right angle bend towards each other for 2.0 m and then continue north until they intersect the north wall. This forms a smaller square compartment (7.0x5.5 m) north of the main enclosure (c. 11.0x6.0 m).

The interiors of the walls are filled with angular basalt cobble, while the wall facings are constructed of waterworn and angular basalt boulders (average size - 30 cm), and fragments of coral conglomerate. The interior of the larger compartment appears to be paved with basalt stone, however, much of the surface is covered with organic and rock debris. The interior of the smaller compartment is slightly raised (c. 20 cm) and is comprised of an uneven surface of basalt stone. No artifacts or midden were found in the structure, however, a large number of branch coral fragments were observed on the surface. The vegetation is the same as Site C3-27, but denser.

No subsurface testing was conducted at this site.

Discussion

Since no excavations were done at this site the data is limited. The structural complexity of this site combined with the presence of branch coral, however, may indicate an association with religious activity. Another possibility is that the site is a specialized structure such as a men's house, however, the apparent absence of midden and artifacts contradicts this interpretation.

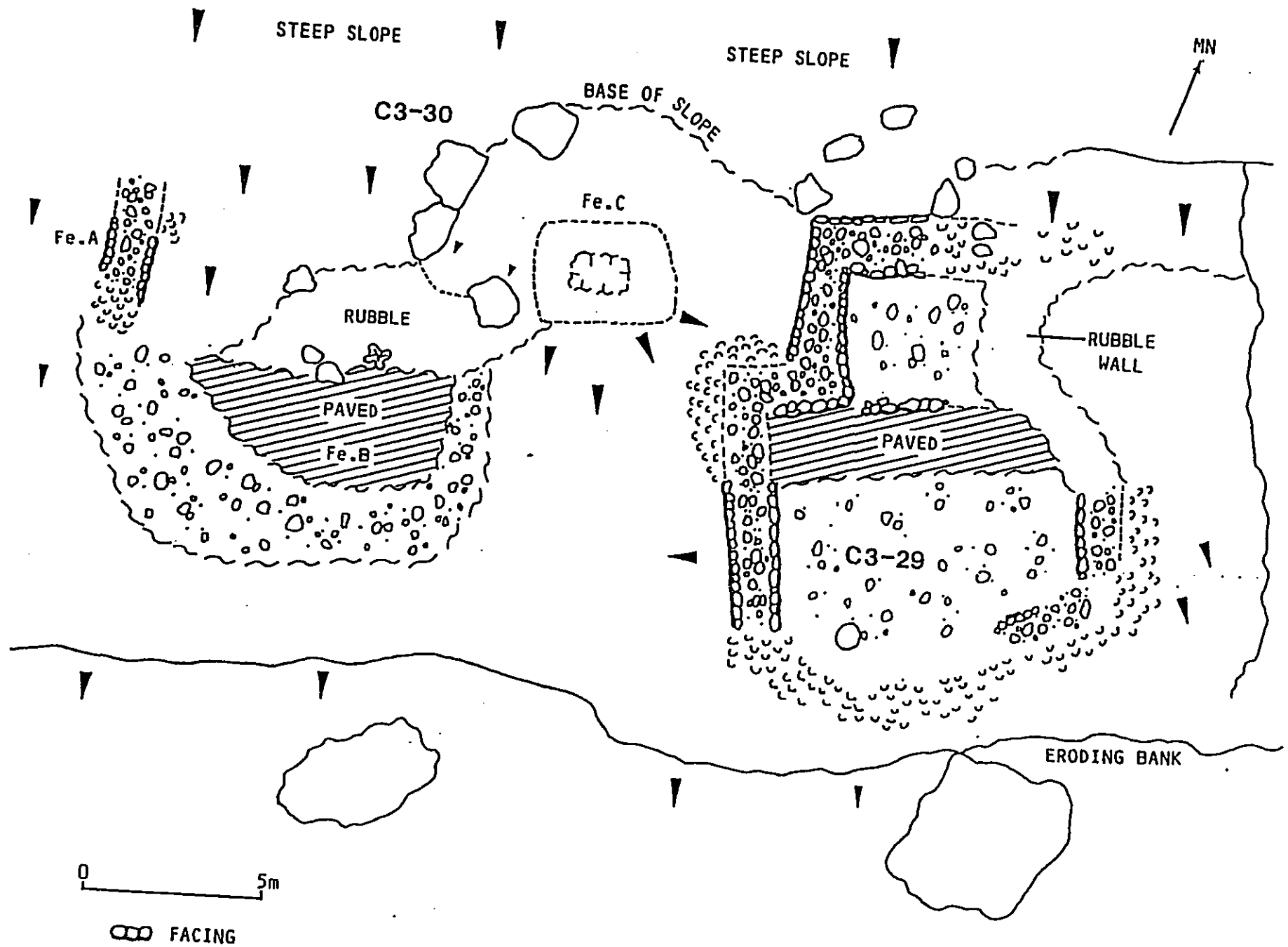


FIG. 30. MAP OF SITE 50-OA-C3-29 AND C3-30.

Site 50-Oa-C3-30

This site consists of three features (Fe A, Fe B and Fe C) located 10 m west of Site C3-29 (Fig. 30) Fe A is a wall segment constructed of stacked angular basalt (average size - 30 cm). The wall is c. 3.0 m long, 1.0 m wide, 70 cm high and is built against the talus slope. Fe B is an irregular exposure of pavement that is c. 6.0x3.0 m. Fe C is a badly disturbed, roughly rectangular, cairn that measures c. 3.0x3.5 m and is c. 70 cm in height. The interior of this structure appears to have been recently excavated and a c. 1.0 m square pit, 30 cm deep is located at the center of the cairn. Debris from the disturbance completely covers the structure and consists of small (average size - 8 cm) fragments of coral conglomerate and branch coral. A concentration of stone rubble is located south of these features. The vegetation in this area is the same as Site C3-29. The skeletal remains of a goat and modern debris such metal fragments and beer cans are present on Fe B, but no prehistoric-type midden nor artifacts were observed on any of the features.

No subsurface testing was conducted at this site.

Discussion

The shape of the stone rubble indicates that it may have been a wall connected to Fe A, forming a partial enclosure around Fe B. The large amount of branch coral observed in association with Fe C and its shape strongly suggest that it may be a shrine.

Site 50-Oa-C3-31

This site is a small rockshelter situated in the boulder outcrop where Site C3-26 (petroglyphs) is located. The interior of the site is roughly rectangular and measures 1.4x1.0 m (Fig. 31). The ceiling is formed by a steeply sloping basalt slab that is c. 1.0 m at its highest. The interior space is very limited and large enough for only one adult (Fig. 32). A crude stacked stone wall c. 1.0 m long, 0.6 m wide, and 1.15 m high is constructed near the northwest end of the site amidst large boulders that form the site boundary. Three artifacts (two basalt flake and a coral abrader) were recovered from the surface of the interior.

A 50x50 cm test pit (TP-1) was excavated in the center of the shelter floor using three 5 cm levels for vertical control. A 25x25 cm extension was later

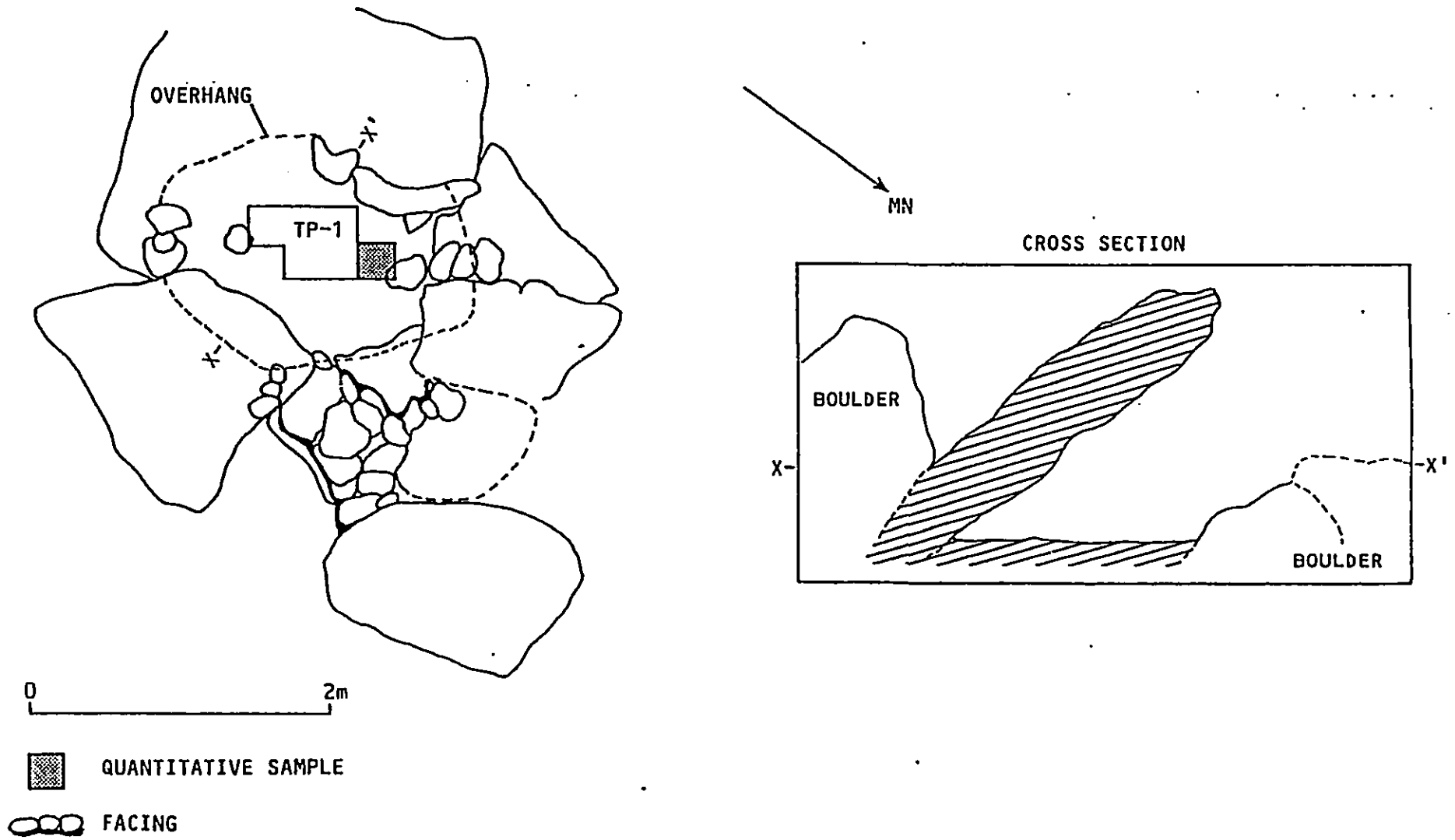


FIG. 31. MAP OF SITE 50-OA-C3-31.

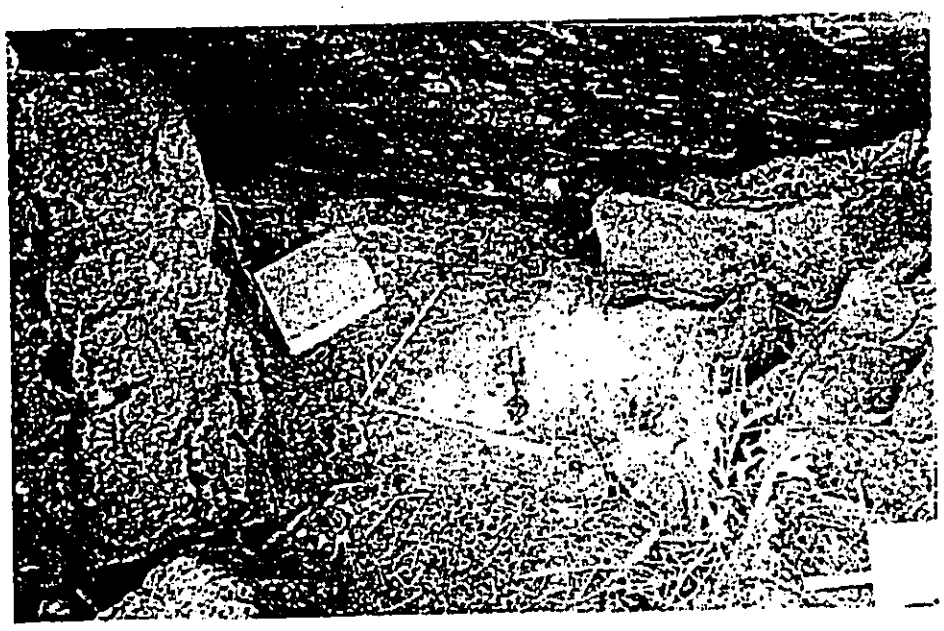


FIG. 32. INTERIOR OF SITE 50-OA-C3-31
View to Southwest. BPBM Neg. No. Oa(a)364-31.

FIG. 33. SHELL ORNAMENT, TP-1, SITE 50-OA-C3-31.
(illustration by Bonnie Froman)

no features were found in the excavations. A 25x25 cm quantitative sample of sediments was removed from the north face of TP-1. This sample was not processed, and is stored in the Bishop Museum. Two sediment layers were found under a thin (2 cm) overburden:

Depth	Layer	Description
0-15	I	10YR 5/3; brown silty sand; weak single grain structure; midden, artifacts, charcoal.
15-17	II	7.5YR 4/6; strong brown silt/gravel/pebble; no cultural material.

Twenty artifacts were recovered from the excavation. Fourteen were basalt flakes, 4 volcanic glass flakes, 1 coral abrader, and a marine shell (*Thais intermedia*) that has a 0.5 cm hole ground into the last whorl, near the posterior end of the aperture (Fig. 33).

The shell is small (3.8 cm length, 2.4 cm width) and the exterior surface extremely worn. Larger shells with similar modifications are often interpreted as food or fiber, scrapers. This artifact, however, is too small to serve as a scraper and is classified here as an ornament, as other examples of this type have been previously found in Hawai'i (Y. Sinoto, pers. comm.).

The total amount of marine shell and bone midden recovered from the 5 cm levels was 337.3 grams. The amount of midden from each level is fairly uniform, however, there is some variability in the percentage of each shell genus represented (Table 4). Although a wide range of gastropods are represented, *pipipi* (*Nerita* sp.) is the most common in all layers. Also found in relatively large percentages are the cowrie (*Cypraea sp.*) and drupe (*Drupa* sp.). All these shell species inhabit the shoreline areas adjacent to the site. A small amount of fish bone and mammal bone was also recovered from each level and a piece of *kukui* (*Aleurites mollucana*) shell was found.

A charcoal sample from a depth of 12-15 cm b.s. was analyzed for radiocarbon and an age of 350±80 years was obtained. Calibration of this age at two standard deviations results in a date range of A.D. 1400-1950, at one standard deviation the date range is A.D. 1450-1650. Since the date ranges for five of the seven other charcoal samples analyzed are between A.D. 1300-1650,

and are associated with deposits that contain cultural material similar to that found at this site, the A.D. 1450-1650 date range is adopted.

Table 4
Midden, Site 50-Oa-C3-31, TP-1

Taxon	0-5	5-10	10-15	TOTAL
Bivalvia	3.8	6.8	5.1	15.7
Gastropoda				
Cellana sp.	1.9	2.9	0.7	5.5
Conus spp.	2.0	0.2	2.0	4.2
Cypraea spp.	14.7	8.0	9.5	32.2
Drupa sp.	15.1	22.5	9.7	47.3
Nerita sp.	36.5	53.3	72.6	172.4
Littorina sp.	-	0.1	0.1	0.2
Echinodermata	9.0	6.7	7.1	22.8
Unidentified	14.5	13.8	8.7	37.0
TOTAL	107.5	114.3	115.5	337.3
Mammal bone	3.8	1.9	0.7	6.4
Fish bone	2.7	3.9	2.6	9.2
Aleurites mollucana	0.1	-	-	0.1

Discussion

Since the artifacts and midden obtained from the excavations are prehistoric type, the date range of A.D. 1450-1650 (one standard deviation) is used for interpretation of this site. Although this range is associated with a lower statistical confidence level, all of the prehistoric date ranges obtained for sites in the study area are from a similar time period. The two diagnostic artifacts (both coral abraders) recovered from the site are typically associated with fishing activities. The midden also points to marine resource use as the principal focus of activity at this structure.

The petroglyph site (Site C3-26) is located immediately upslope from this site, and a number of petroglyph figures are located within 10 m of the rockshelter.

Site 50-Oa-C3-32

This site is a mounded midden exposure that measures 80 cm in diameter and is located near the south end of the trail (Site C4-306) that partially encircles Mauna Lahilahi (Fig.3). The dark gray deposit appears to have been disturbed but contains charcoal and marine shell. A crude wooden cross has been recently placed in the deposit. Judging from the size of the disturbance, this may be an animal burial although the cross may simply be a marker.

Discussion

This deposit is possibly related to a prehistoric, temporary habitation.

DISCUSSION

Fourteen of the sixteen sites identified in the study area appear to be associated with prehistoric-type activity. The other two sites, Site C4-309 and the enclosure at Site C3-24 are associated with modern activities in the area such as sheep ranching, military activity, and construction of the landscaped estate.

The present discussion is limited to data from test excavations. It appears, however, that the prehistoric sites located in the study area are related to a wide range of activities. Functional interpretations of the surface structures indicates that habitation, agriculture, lithic technology, marine resource use and religious activity are all represented in the area. Although the data on midden and artifacts focus on marine resource use, the basalt flake scatter associated with Site C4-308 shows that lithic tools were manufactured in the area.

Prehistoric occupation of the study area may have occurred as early as A.D. 1300 and by the 15th and 16th century appears to have been well established. The length of occupation is not clearly defined, however, prehistoric activity in the area probably continued until European contact. Table 5 lists the functional interpretation and chronology of each site.

Table 5

Summary of Site Function, Chronology

Site No.	Functional Interpretation	(A.D.) *Date Range	Summary Description
C3-24	Modern activity		Enclosure
	Prehistoric activity	1300-1500	(pit feature near enclosure)
25	Habitation	1350-present	Rockshelter Layer II
		1350-1650	Fe A
26	Art		Petroglyphs
27	Religious/specialized	1300-1650	Enclosure
28	Religious		Pavement and possible enclosure
29	Religious		Enclosure with platform
30	Religious		Enclosure
31	Habitation	**1400-1650	Rockshelter
32	Habitation		Midden deposit
C4-306	Agriculture		Depressions
307	Habitation/religious	1300-1450	Platform and terrace
308	Habitation/manufacture	1450-1650	Terrace w/flake scatter
309	Modern activity		Boulders w/modifications
310	Prehistoric/Modern	***1650-present	Enclosure
311	Agriculture		Terrace
312	Transportation		Trail

* Except as noted all date ranges are uncorrected for 013/012 ratio and calibrated at one standard deviation.
** Calibrated at one standard deviation
*** Corrected for 013/012 ratio.

Habitation

The habitation sites found in the area appear to be for temporary or intermittent use. With the exception of the rockshelter near the point (Site C3-25) the sites are generally small and do not have deep, nor extensive midden deposits. The artifacts recovered from the habitation sites are principally related to marine resource use and lithic technology. Marine resource use could be seasonal or related to localized weather conditions since highly variable wave activity including very high surf, is known for this coast.

The manufacture of lithic tools may have been an intermittent activity in this area since locally available materials are of poor quality and the material utilized was probably imported from other areas.

The initial occupation of the large rockshelter at the point appears to

c. 20 cm thick and contains a high density of marine shell, charcoal, and bone. Subsequent occupations appear to have been short term resulting in much lower quantities of midden and a very different pattern of sediment deposition. These interpretations are tentative, however, since only half of a square meter pit was excavated and the area of the shelter floor is about 70 square meters.

Agriculture

The interpretation of sites C4-306 and C4-311 as agricultural sites is very tentative and there is no direct evidence for this use. Even if the interpretation is correct, however, agriculture at these sites would have been very limited and probably secondary to other activities.

Lithic Manufacture

Almost all of the lithic material recovered during the study was basalt flakes. A detailed analysis is beyond the scope of this work, however, most of the material from the sites was of very similar texture and color. A single fragment of fine grained basalt was found on the surface near the lithic scatter at Site C4-308. This lithic scatter is estimated to contain c. 3000 basalt flakes and it appears that a lithic workshop was present either at C4-308, or very nearby. A basalt core, a grindstone, a hammerstone, and an adz preform were found on the surface of Site C4-310 (immediately downslope C4-308), which is associated with the same lithic scatter.

Two flakes recovered from the large rockshelter (Site C3-25) are composed a light brown, very fine textured material that may be calcite. The material effervesces with acid and was probably formed in the raised coral reef that comprises much of the lower elevation substrate in the study area.

Religious Sites

Four sites in the area appear to be related to religious activity. Three of them, Sites C3-28 Fe A, C3-29, and C3-30 Fe C, are relatively large, complex in architecture and have coral fragments scattered on the surface. These characteristics are thought to be attributes of religious structures (Cordy 1978:114). Site C4-307 was interpreted as a fishing shrine in a previous study. The structure was rebuilt and subsequently damaged, so reinterpretation at this time is very difficult and an association with religious activity is adopted.

Sites C3-28 Fe A and C3-30 Fe C are relatively small structures with total areas of 30.0 and 10.5 square meters, respectively. The small size of these structures may indicate that they are shrines (associated with individual or small group activity) rather than *heiau* (religious site associated with a lineage). The large size c. 104.5 square meters and architectural complexity of C3-30, however, suggests that it may be a *heiau*.

Settlement Pattern

To understand these sites in terms of settlement patterns in prehistoric Hawai'i, they must be discussed in relationship to the archaeological model developed by Green for Mākaha *ahupua'a*. This model proposes that the focus of prehistoric settlement quickly shifted from the coastal areas of Mākaha to inland areas and that by c. A.D. 1400-1500 a permanent settlement was established in the interior. A corollary to this is the subsequent establishment of the "coastal-inland orientation typical of the ethnohistoric *ahupua'a*" and a "shift of permanent population from the coast to an inland zone of lower population density" (Green 1980:75, 76). Green also argues that early historic accounts of the area support the model.

The same early historic accounts, however, show that the prehistoric settlement at Kamaile did not shift its focus inland and in early historic times was still located on the coast although intensive use of inland areas for agriculture is also evident (Ibid:8, 12).

In this context the interpretation of the sites located at Mauna Lahilahi is somewhat problematic. Although local informants indicate that the entire area is part of Mākaha, all of the references reviewed for this study show that the boundary between Mākaha and Kamaile divides Mauna Lahilahi in half. To add weight to this argument, previously referenced map drawn c. 1850 by Makalena also shows that Mauna Lahilahi defines the boundary between the fishing grounds of Mākaha and Kamaile, and it is unlikely that a mistake in allocation of such an important resource would occur, and less likely, be allowed.

In his discussion of the "evolution of Hawaiian culture" Kirch argues that in Hawai'i c. A.D. 1450-1650 the *ahupua'a* was becoming established as the "central units of territorial organization" and as "the amount of available land diminished, the necessity of defining territorial boundaries increased" (Kirch

play a major role in the development of Mākaha, the Wai'anae area appears to have been well populated. It is likely that efforts at expansion from those areas may have had an effect on adjacent areas. If this were the case it is likely that Mauna Lahilahi was an area that was contested during this period an the chronology of the prehistoric sites at Mauna Lahilahi correlate well with this period of time.

The deposit in the large rockshelter (Site C3-25), and the location of the religious sites in the area also fit well with this model. Large rockshelters such as Site C3-25 often provide data on early prehistoric activity, in this case, however, the lowest cultural layer is associated with a relatively late date range. Although the available data is very limited, in relationship to stratigraphically higher levels, the lowest (earliest) cultural deposit appears to reflect comparatively intense activity at the site over a relatively short period of time. This would correlate well with the initial assertion of territorial rights in the area.

The establishment of possible religious structures on the south coast of the study area (Sites C3-27,28 and 29) and the single religious structure on the north coast (Site C4-307) appears to be at least partially related to the establishment and maintenance of territorial boundaries. Such structures would enhance the definition and stability of such boundaries by providing a focus fo activities associated with a larger social group.

Although the discrepency in the numbers and relative complexity of the sites on the north coast (*vers* Mākaha) and on the south coast (*vers* Kamaile) of the study area may be due to a sampling problem (the north side has been more extensively disturbed), it seems more likely that it is related to differences in the location of the primary settlements in the two *ahupua'a*. Simply based o proximity to the area, the coastal settlement at Kamaile would tend to be more concerned with establishing its territorial rights in close-by shoreline areas than the inland settlement at Mākaha. This higher concern appears to have been expressed in the larger number and greater complexity of religious structure constructed at Mauna Lahilahi.

RECOMMENDATIONS

Evaluations of individual site condition and interpretive value are listed in Table 6. In addition, initial significance assessments based on the National Register Criteria are presented. Although the sites differ in condition, research potential, and interpretive value, more generalized resource management concerns are of major interest (see below).

The project area was divided into two areas (Areas A and B) based on the presence or absence of previous research. The planned development activities are presently situated in Area A and these recommendations are principally concerned with this area. The condition of the sites are evaluated through a qualitative assessment of the site's structural integrity. The interpretive value of a site is based on the potential of a site for public use or display, and takes into consideration; uniqueness in the region, site condition, environment and accessibility.

Area A was the subject of an earlier study and most of the archaeological resources had been identified. During the current work in this area subsurface testing in all sites, and along six transects, was conducted. No intact subsurface deposits were found in the areas covered by the transects and it is likely that modern activities have resulted in the loss of much of the archaeological resources in these areas.

Area B was not included in the previous work and no development activities are planned in this area. Although it is likely that most, if not all, archaeological resources were identified, subsurface testing in this area was very limited and the research was at the reconnaissance level of intensity. The sites this area are generally better preserved, display greater complexity and are probably related to prehistoric religious activity.

It is recommended that all but two of the archaeological sites be preserved. In order to adequately protect the sites that are to be preserved, and with specific regard to the proposed development in Area A of the study area, a minimum of 6-10 ft of buffer space around each structure or site area should be provided.

Table 6
ARCHAEOLOGICAL SITE EVALUATIONS

SITE NOS. Kennedy	BPBM	State	Summary Description	*Condition	*Interpretive Potential	**Initial Significance Assessment A	B	C	D	E
	C3-24	07-3704a	Enclosure, nearby deposit	Fair	Poor					
	-25	-3704b	Rockshelter	Excellent	Good	X			X	
	-26	-3704c	Petroglyphs	Fair	Good	X			X	X
	-27	-3704d	Enclosure	Fair	Good	X			X	
	-28	-3704e	Paving, facings	Fair	Good	X			X	X
	-29	-3704f	Enclosure	Good	Good	X			X	
	-30	-3704g	Enclosure, platform	Fair	Good	X			X	
	-31	-3704h	Rockshelter, wall	Good	Good	X			X	
	-32	-3704i	Midden deposit	Fair	Poor				X	
1	C4-306	-3704j	Walled depressions	Good	Good				X	
2	-307	-3704k	Platform, terrace	Fair	Good	X			X	X
3	-308	-3704l	Terrace, flake scatter	Poor	Poor	X			X	
4	-309	-3704m	Boulders w/modifications	Fair	Poor					
5	-310	-3704n	Enclosure	Good	Good	X			X	
	-311	-3704o	Terrace	Fair	Fair				X	
	-312	-3704p	Trail	Fair	Good	X				

* Excellent, Good, Fair, or Poor.
**National Register Criteria
A - Association with events or broad patterns important in the history of an area.
B - Association with persons important in the history of an area.
C - Reflects architectural achievement.
D - Has yielded or has the potential to yield information significant for the understanding of traditional culture, history, prehistory, and/or foreign influences on traditional culture and history.
E - Perceived by the contemporary community as having traditional cultural value.

BPBM site numbers prefixed by: 50-0a-
State of Hawai'i site numbers prefixed by: 50-80-

The sites for which preservation is not recommended are Sites 50-Oa-C4-309 and 50-Oa-C3-24. None of the National Register Criteria for determination of significance apply to Site C4-309, a recently constructed terrace, nor Site 50-Oa-C3-24 (probably also of recent origin) where subsurface testing indicates that no intact cultural deposit is present.

No further work is recommended for C4-309, however, archaeological monitoring is recommended for any ground altering activities in the area northeast of the enclosure at Site C3-24, and the sand dune area at the northeast boundary of the study area (Fig. 34). Although subsurface testing in this area did not locate any intact subsurface cultural deposits, sand dunes frequently contain prehistoric burials and represent a potential concern for the community.

It is also recommended that intensive data recovery be conducted for the portion of site 50-Oa-C4-308 that is presently endangered. The surface concentration of basalt flakes located downslope of site Ha-Oa-C4-308 is actively eroding and is being mixed with road fill material. Intensive data recovery in the form of a systematic collection of the flake material should be conducted.

Resource Preservation Concerns

Recent land development activities in the coastal areas of Mākaha have left very few areas unaltered, and as a direct result, few archaeological sites near the shoreline are likely to remain. In addition, previous to this study and the research by Kennedy on this area in 1986, no archaeological investigations of sites near the shoreline had been conducted in this area. Therefore, the archaeological resources located in the present study area are unique in that they are probably the only sites left near the shoreline and have undergone documentation and archaeological research.

The interior areas of Mākaha have been the subject of extensive archaeological investigations and a model of prehistoric settlement has been developed for the area (see above-Discussion). Due to restrictions in the original project boundaries, however, the coast could not be included in the fieldwork and the model uses inference rather than direct evidence with regard

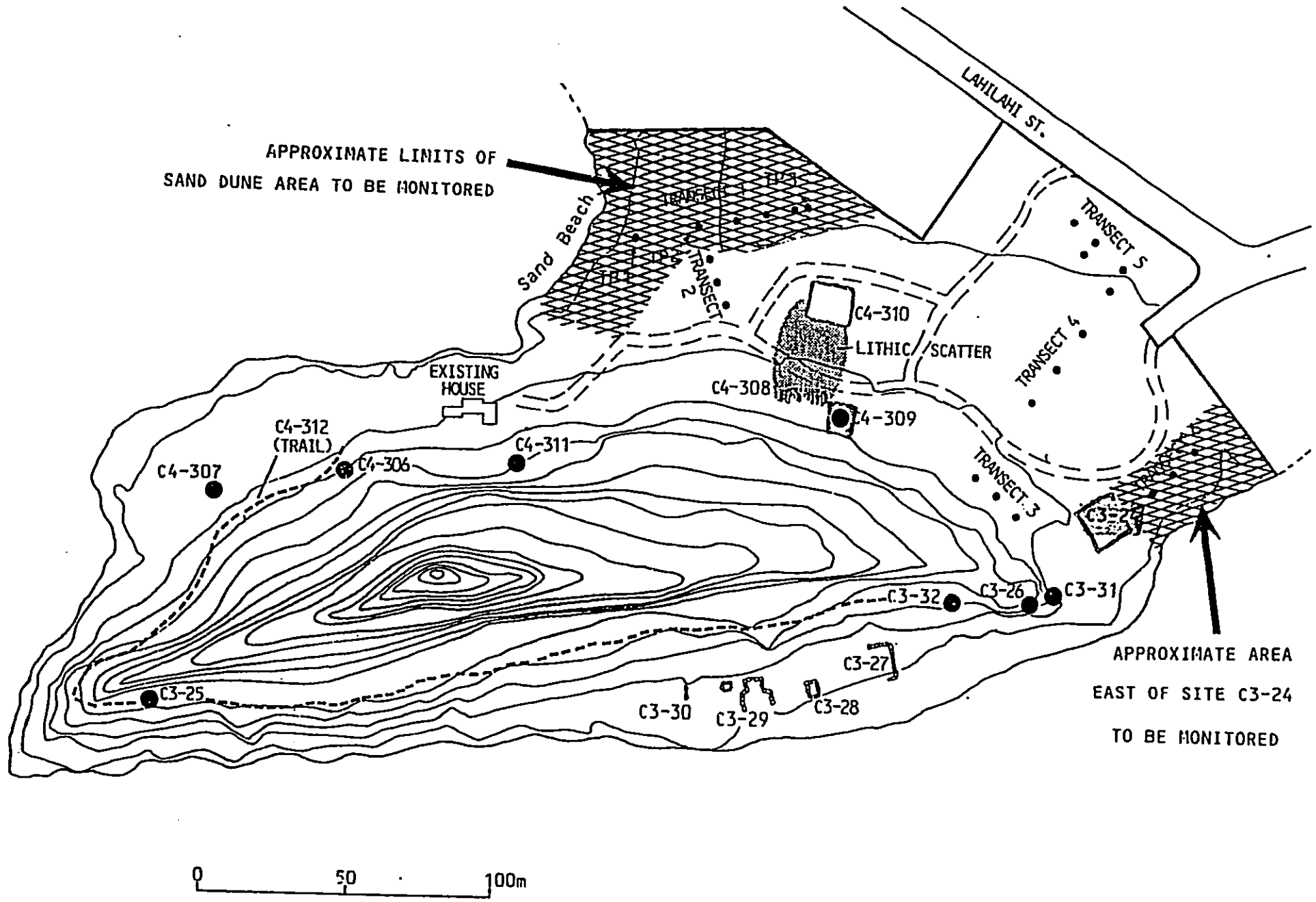


FIG. 34. MAP OF PROJECT AREA SHOWING PORTIONS OF AREA A, REQUIRING

to these areas. So, although the model is important to the study of the prehistory of Hawai'i in general, as well as the prehistory of Mākaha, and the Wai'anae District, a major area of concern has yet to be adequately addressed (i.e. prehistoric coastal settlements). Therefore, the extensive research conducted in the nearby inland areas has increased the significance of the remaining archaeological resources in shoreline areas and further support their preservation.

Ladd, E. J., and D. E. Yen (eds.)
1972 *Makaha Valley Historical Project: Interim Report No. 3.* Pacific Anthropological Records No. 18. B. P. Bishop Mus.

Macdonald, G. A., A. T. Abbott, and F. L. Peterson
1983 *Volcanoes in the Sea, the Geology of Hawaii.* Honolulu: Univ. Hawaii Press.

Makalena
c. 1850 "*Ahupuaa o Makaha, Waianae, Oahu*". Blueprint map on file at Dept. Anthropology, Bishop Museum.

Neal, Mary
1965 *In Gardens of Hawaii.* B. P. Bishop Mus. Spec. Pub. 50. Honolulu: Bishop Mus. Press.

Sterling, E. P., and C. S. Summers
1978 *Sites of Oahu.* Depts. Anthro. and Educ. B. P. Bishop Mus.

Stearns, H. T.
1939 *Geology Map and Guide of the Island of Oahu, Hawaii.* Bulletin 2. Hawaii Div. of Hydrography.

Stuiver, Minze and B. Becker
1986 "A High Precision Decadal Calibration of the Radiocarbon Time Scale, AD 1950-2500 BC." *Radiocarbon* 28(2B):863-910.

Stuiver, Minze and P. J. Reimer
1986 " A Computer Program for Radiocarbon Age Calibration." *Radiocarbon* 28:(2B):1022-1030.

Vancouver, George
1978 *Voyage of Discovery to the North Pacific Ocean and Around the World, 1790-1795.* Vol. II. London: G. G. & J. Robinson.

REFERENCES

Armstrong, R. W. (ed.)
1983 *Atlas of Hawaii.* Univ. Press of Hawaii.

Beckwith, M. W.
1970 *Hawaiian Mythology.* Honolulu. Univ. Hawaii Press.

Cleghorn, P. L.
1980 *The Hilina Pali Petroglyph Cave Petroglyph Cave, Hawai'i Island: A Report on Preliminary Archaeological Investigations.* Departmental Report Series 80-1. Dept. Anthropology, B. P. Bishop Mus.

Cordy, R. H.
1978 *A Study of Prehistoric Social Change: The Development of Complex Societies in the Hawaiian Islands.* PH.D Dissertation. Univ. Hawaii.

Foote, D. E., E. L. Hill, S. Nakamura, and F. Stevens
1972 *Soil Survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* Washington, D. C.: U.S. Govt. Printing Office.

Green, R. C.
1969 *Makaha Valley Historical Project, Interim Report No.1.* Pacific Anthropological Records No. 4. B. P. Bishop Mus.

Green, R. C.
1970 *Makaha Valley Historical Project, Interim Report No.2.* Pacific Anthropological Records No. 10. B. P. Bishop Mus.

Green, R. C.
1980 *Mākaha Before 1880 A.D.* Pacific Anthropological Records No. 31. B. P. Bishop Mus.

Handy, E. S. C., and E. G. Handy
1972 *Native Planters in Old Hawaii.* B. P. Bishop Mus. Bull. 233.

Kennedy, J.
1986 "Archaeological Investigations at Mauna Lahilahi, Wai'anae, Island of O'ahu." Typescript, Archaeological Consultants of Hawaii, Inc. Prepared for Franklin Gray & Associates

Kirch, P. V.
1985 *Feathered God and Fishhooks.* Honolulu: Univ. Hawaii Press.

Jackson, G. E. G.
1884 "Waianae and Adjacent Coast Oahu". Blueline map on file at Dept. Anthropology, Bishop Museum.

Ladd, E. J.
1973 *Makaha Valley Historical Project: Interim Report No. 4.* Pacific Anthropological Records No. 19. B. P. Bishop Mus.

APPENDIX A-1

State Historic Preservation Division Letter

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

PBR HAWAII
MAR 3 0 1998
Project
Project No.

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

DEPUTIES

GILBERT COLOMA-AGARAN

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

March 5, 1998

Mr. Todd P. Black
PBR Hawaii
1001 Bishop Street, Pacific Tower, Suite 650
Honolulu, Hawaii 96813-3429

LOG NO: 21131
DOC NO: 9802SC14

Dear Mr. Black:

SUBJECT: **Chapter 6E-8 Historic Preservation Review of the Proposed Mauna Lahilahi Cultural Garden**
Makaha, Waianae District, O'ahu
TMK: 8-4-001: 008 & 009; 8-4-003: 011; 8-4-004: 005 & 009

Thank you for the opportunity to comment on the proposed cultural garden to be built at Mauna Lahilahi in Makaha, O'ahu. According to the plans you transmitted, the City and County of Honolulu Department of Parks and Recreation proposes to make site improvements to their park at Mauna Lahilahi. Proposed improvements include landscaping, the installation of a subgrade irrigation system in the lawn areas, and upgrading of the existing parking area off Lahilahi Street. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the subject parcel.

In general, the proposed improvements are to be built in areas that either have no historic sites present or in locales that were previously surveyed and found to be without significant historic sites (*Archaeological Survey and Testing at Mauna Lahilahi, Wai'anae District, Island of Maui*. 1987. Komori). In view of these facts, we believe that the proposed undertakings will have "no effect" on significant historic sites. We would, though, recommend adding the following construction note to any plans prepared for the project:

Should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during construction activities, work shall cease immediately in the immediate vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division (587-0047), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary.

Should you have any questions, please feel free to call Sara Collins at 587-0013.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jk