DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
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DEPUTY DIRECTOR

2000/SMA-56

October 11, 2000

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

Dear Ms. Salmonson:

SPECIAL MANAGEMENT AREA ORDINANCE
CHAPTER 25, ROH
Environmental Assessment (EA)/Determination
Finding of No Significant Impact

Recorded Owner	:	City and County of Honolulu
Applicant	:	Department of Design and Construction
Agent	:	Kimura International (Glenn Kimura)
Location	:	750 Kaha Street - Kailua
Tax Map Key	:	4-2-16: Por. 1 and Por. 8
Request	:	Special Management Area Use Permit
Proposal	:	Improvements to the existing Kawai Nui Community Park, including replacement of the existing gravel-based parking lot with an asphalt concrete parking lot and creation of a passive park.
Determination	:	A Finding of No Significant Impact is Issued

Attached and incorporated by reference is the Final EA prepared by the applicant for the project. Based on the significance criteria outlined in Title 11, Chapter 200, Hawaii Administrative Rules, we have determined that preparation of an Environmental Impact Statement is not required.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the Final EA. If you have any questions, please contact Jeff Lee of our staff at 527-6274.

Sincerely yours,

RANDALL K. FUJIKI, AIA
Director of Planning
and Permitting

RKF:lg
Encls.

posse doc no. 57816

2000-11-08-OA-FEA-

FINAL
ENVIRONMENTAL ASSESSMENT

(Kawai Nui Community Park)
Parking Lot and Landscape Improvements

Project:
Vision 2000 - Playcourt and Play Apparatus
Various Parks, Kailua Recreation District 4

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF DESIGN
AND CONSTRUCTION

October 2000

FINAL
ENVIRONMENTAL ASSESSMENT
&
FINDING OF NO SIGNIFICANT IMPACT

Kawai Nui Community Park
Parking Lot and Landscape Improvements

Prepared for:

Department of Design and Construction
City and County of Honolulu

Prepared by:

Kimura International, Inc.

October 2000

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Executive Summary

The Department of Design and Construction (DDC) of the City and County of Honolulu is proposing to improve the existing Kawai Nui Community Park by 1) replacing an existing temporary gravel-based parking lot with a permanent 40-stall asphalt concrete parking lot, and 2) creating a passive park at the adjoining triangular area that is currently unimproved open space. The land is owned by the City and County of Honolulu and identified by TMK: 4-2-16: 01 por. and 4-2-16: 08 por. The proposed action is consistent with the State Conservation District Subzone regulations and the City and County General Plan, Development Plan, Zoning, Flood Hazard and Shoreline Management Area regulations.

The proposed project is located at the existing Kawai Nui Community Park (aka Kaha Park). The park is located on fast land on the northern fringe of Kawai Nui Marsh and is accessible from Kaha Street in the Coconut Grove Subdivision of Kailua. The 4.4-acre park site was originally built in 1978 after receiving a Conservation District Use Permit from the State Department of Land and Natural Resources (CDUA #OA-2/28/78-1036) and later subdivided from the larger Kawai Nui Marsh in 1994 (CDUA #OA-11/5/93-2679). The proposed project is located on the northern side of the park and is bound by the Kaelepulu Channel *Extension* to the west and *townhomes* on the east. The new parking lot is approximately 0.4 acres and the triangular passive park encompasses approximately 1.0 acres. Development of the passive park will increase the existing park by approximately 1.0 acre.

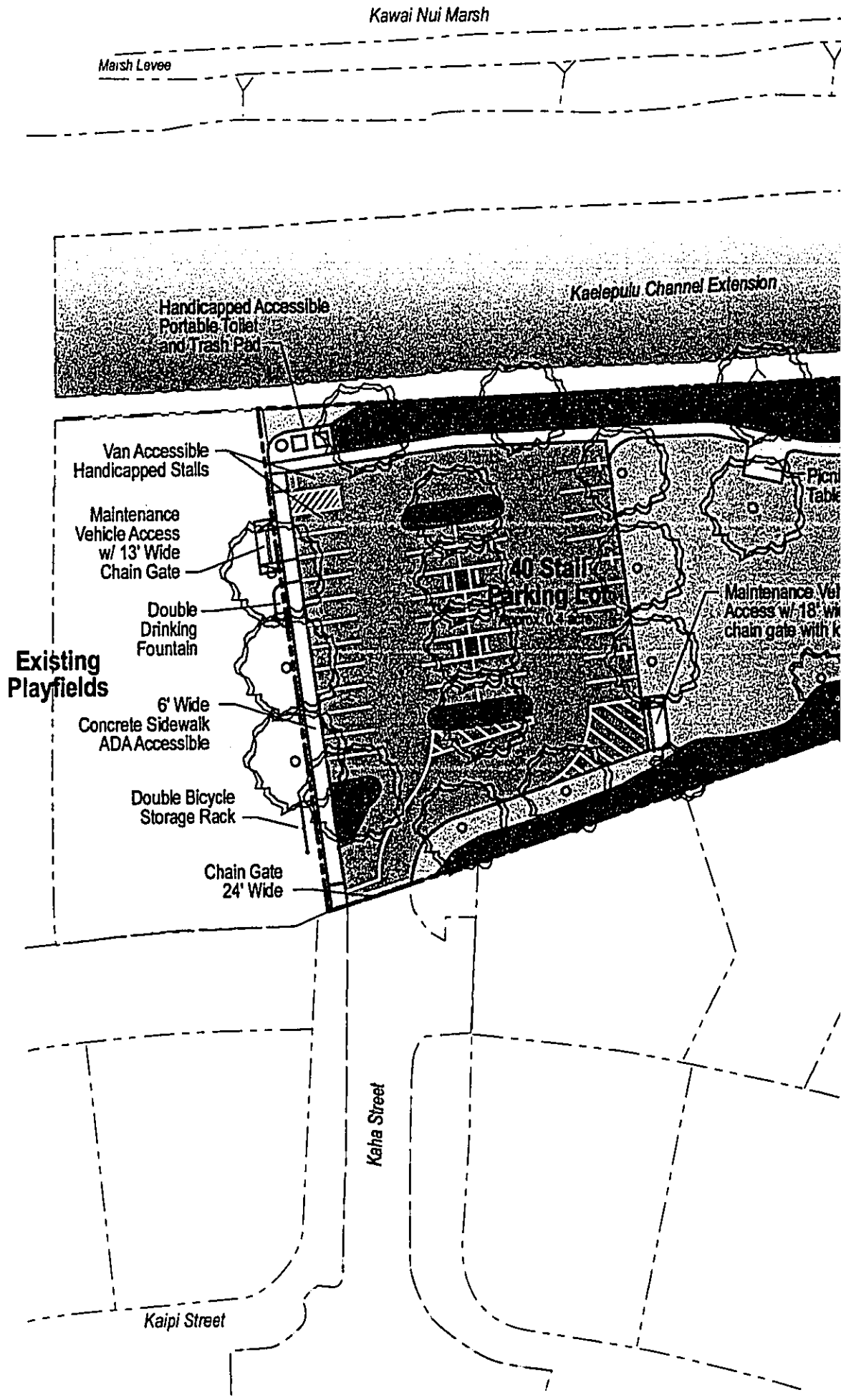
Parking lot features include 40 marked stalls, two of which will be restricted handicapped accessible stalls, canopy shade trees, irrigation system, a concrete sidewalk that extends along the southern and western sides of the parking lot, a lockable chain entry gate, double bicycle storage rack, double drinking fountain, and a concrete pad for two *handicapped accessible* portable toilets and trash container. The southwestern and northeastern corners of the parking lot will have chain gates with locks to provide access for maintenance vehicles. No lights will be provided in the parking lot or any area of the proposed improvements.

Landscape improvements to the adjacent triangular area will consist of a 4' wide meandering sidewalk that extends from the parking lot adjacent to the Kaelepulu Channel *Extension* and terminates at an existing rock monument identifying the Kawai Nui Flood Control Project, one picnic table positioned over a concrete pad, a park bench, large canopy shade trees, native accent trees, interpretive planting on the mauka and makai edges, and grassed open areas in the central portion of the triangular area.

Two alternatives, a no action alternative and an alternative design, were considered but rejected in favor of the proposed action. The proposed action is the result of design refinements following County and community input and review meetings *held by the Vision Team.*

Environmental impacts associated with the proposed action are limited to temporary construction related noise, air quality and potential surface runoff and soil erosion issues. However, with proper mitigating measures and the use of best management practices during construction, these environmental impacts are not judged to be significant. There is no significant archaeological evidence on site and no impacts are anticipated with respect to wildlife or botanical resources. Long-term impacts are positive because the proposed action will enhance an existing public recreational facility that is an appropriate and permitted use under State and County land use regulations. Furthermore, the proposed action provides positive benefits to residents of the community and users of the existing park.

This Final EA (FEA) and Finding of No Significant Impact (FONSI) has been completed in compliance with the Hawaii Environmental Review Process and Chapter 200 of Title 11, Department of Health Administrative Rules, Sections 10, 11 & 12 in compliance with requirements for a Special Management Area Use Permit, Major. Environmental impacts directly associated with the construction of the parking lot and landscape improvements were assessed. Based on the environmental consequences associated with the proposed action assessment, a Finding of No Significant Impact (FONSI) is anticipated. See Figure ES-1, Site Plan.


Kawai Nui Marsh
Marsh Levee
Kaelepulu Channel Extension
Handicapped Accessible Portable Toilet and Trash Pad
Van Accessible Handicapped Stalls
Maintenance Vehicle Access w/ 13' Wide Chain Gate
Double Drinking Fountain
Existing Playfields
6' Wide Concrete Sidewalk ADA Accessible
Double Bicycle Storage Rack
Chain Gate 24' Wide
40 Stall Parking Lot
Kaha Street
Kaipi Street

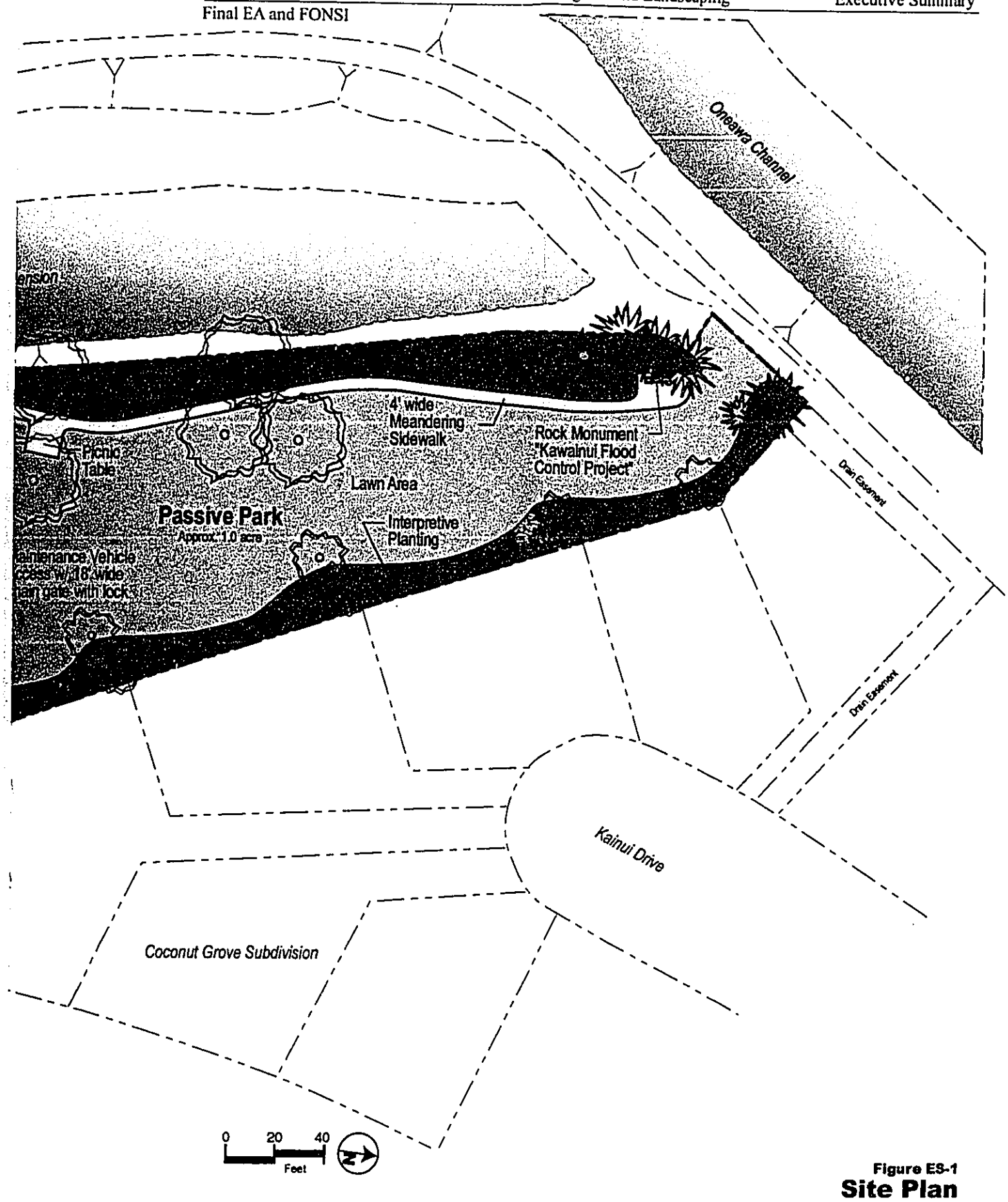


Figure ES-1
Site Plan

I. General Information

This Final Environmental Assessment has been prepared pursuant to the Administrative Rules of the Department of Health, Chapter 200 of Title 11, "Environmental Impact Statement Rules," Sections 10, 11, 12 as required for a Special Management Area Use Permit (SMP) under Chapter 25, Revised Ordinances of Honolulu, as amended.

A. Applicant:
Mr. Gary Q.L. Yee, AIA
Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 10th Floor
Honolulu, HI 96813
Tel: 523-4182
Fax: 523-4054

B. Recorded Fee Owner: City and County of Honolulu

C. Agent
Kimura International, Inc.
1600 Kapiolani Blvd., Suite 1610
Honolulu, HI 96814
Tel: 944-8848
Fax: 941-8999
Attn: Glenn T. Kimura

D. Tax Map Key: 4-2-016:01 por. and 08 por.

E. Lot Area: Approximately 1.4 acres

F. Agencies Consulted:
City and County of Honolulu, Department of Design and Construction
City and County of Honolulu, Department of Parks and Recreation
City and County of Honolulu, Department of Planning and Permitting
Department of Land and Natural Resources, State Historic Preservation Division
Department of Land and Natural Resources, Land Division
<Kailua Neighborhood Board No. 31> *delete*
Kailua Vision Team
Residential property owners adjacent to the Kawai Nui Community Park

II. Description of the Proposed Action

A. General Description

(1) Proposed Project

The proposed project, an initiative of the Kailua Vision 2000 Team, consists of a 40-stall, asphalt parking lot and landscape improvements to a triangular open area that is part of the existing Kawai Nui Community Park. The parking lot is considered an accessory structure to the existing park. Access to the project site is at the terminus of Kaha Street in the Coconut Grove Subdivision. The total project area encompasses approximately 1.4 acres. The parking lot will occur on an area that is currently a temporary, gravel-based parking area defined by used concrete piles and used sewer or water pipes. The new parking lot measures approximately 17,500 square feet. The project scope also includes development of a passive park on the adjacent undeveloped triangular open area (approximately 1 acre) located on the opposite side of the existing play fields.

The existing park was developed on land located on the northern fringe of the Kawai Nui Marsh, the largest remaining wetland in Hawaii and the subject of an Environmental Restoration Project sponsored by the U.S. Army Corps of Engineers, Honolulu District in cooperation with the State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife. A Conservation District Use Application (CDUA) permit (CDUA OA-2/28/78-1036) was approved for the park in 1978 and playfields, irrigation, fencing and a gravel-based parking lot were added shortly thereafter. The project site, which is located on the northern side of the park, is bound by *townhomes* on the east, and the Kaelepulu Channel *Extension* to the west.

The proposed action was initiated because of pent up demand for parking at a recreational park that receives heavy use already. According to Ms. Cindy Turner (a Kailua resident) and Mr. Alan Heu (also a Kailua resident, as well as a youth soccer advocate), the playfields are used extensively during the weekends, particularly on Saturdays, with as many as 14 AYSO soccer teams. Participants ranging in age from 8 to 10 years use the fields for practice and tournament play. The AYSO league has two seasons: the Fall season, which runs from mid-August until mid-November, and the Spring season, which runs from January through February. On Saturdays, the first game starts at 8:00 am and the last game starts at 3:30 pm. In addition, the more advanced, HYSA soccer league uses the park for practice and games on Sundays. In this league, as many 5 games may be scheduled, involving 10 teams whose participants range in age from 12 to 18 years. The playfields are also used for youth baseball practices during the baseball season.

The existing gravel-based parking lot can hold only 20 cars or so. It is common for cars to spill over onto adjacent local streets, particularly during the transition period when games are in progress and participants for the next scheduled games arrive to warm up. Mr. Heu

counted approximately 60 cars during one Saturday event in October 1999. Improvements to the parking lot will accommodate only a portion of peak period demand by providing 40 marked stalls within the confines of the recreational area. Park users will continue to use the local streets, but the impact on these streets will diminish accordingly.

2) Relation of parcel to Special Management Area

The proposed project falls within the Special Management Area that encompasses the larger Kawai Nui Marsh.

3) Location Map

See Figure II-1, Location Map and Figure II-2, Tax Map Boundaries.

4) Land Use Approvals

A Major Shoreline Management Permit is required for the proposed project because the project falls within the Shoreline Management Area and construction cost estimates exceed $125,000. In addition, a Conservation District Use Permit (CDUP) is required because the land falls within the State Conservation District. Building and grading permits are required for construction.

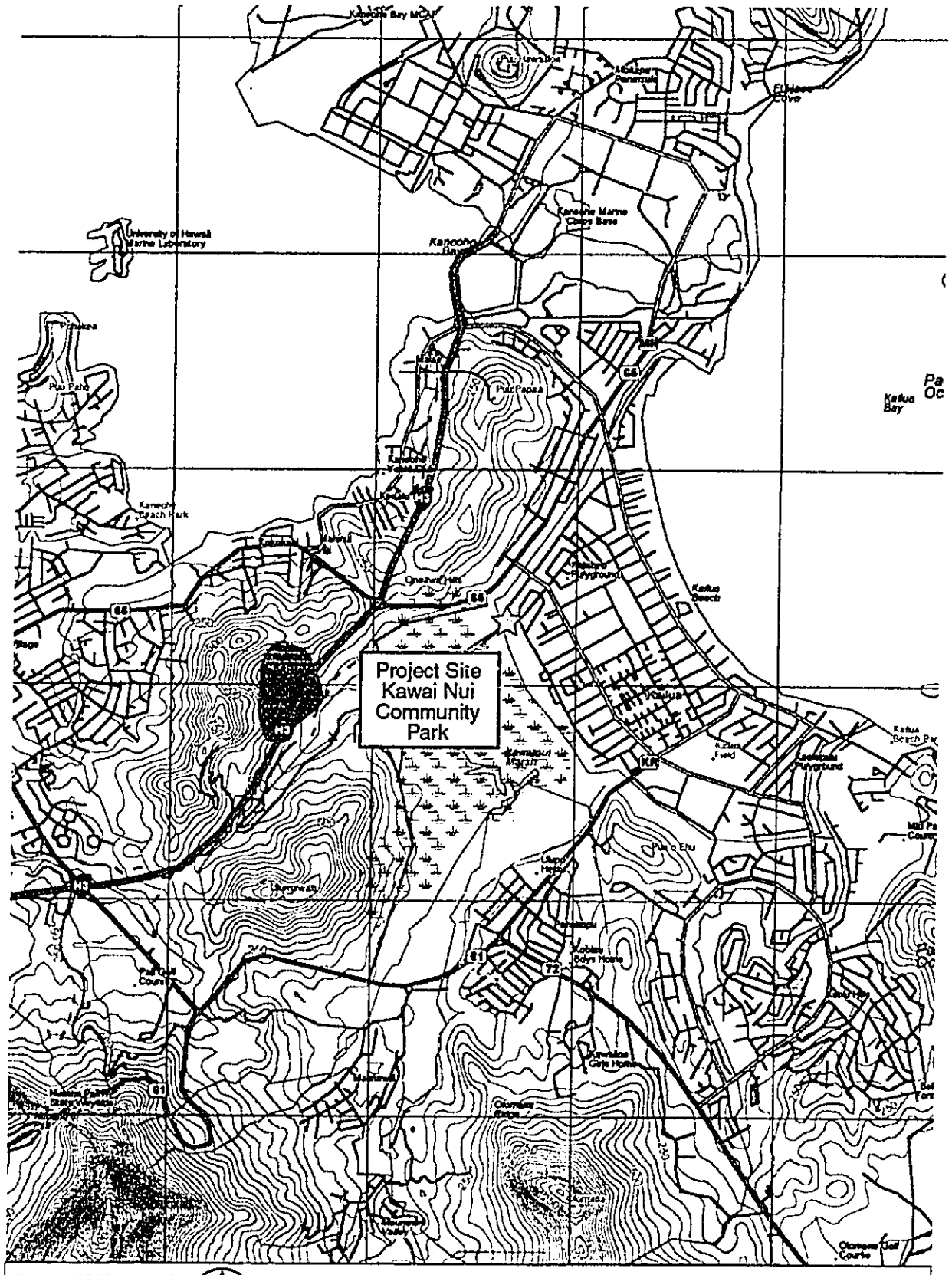


Figure II-1
Location Map

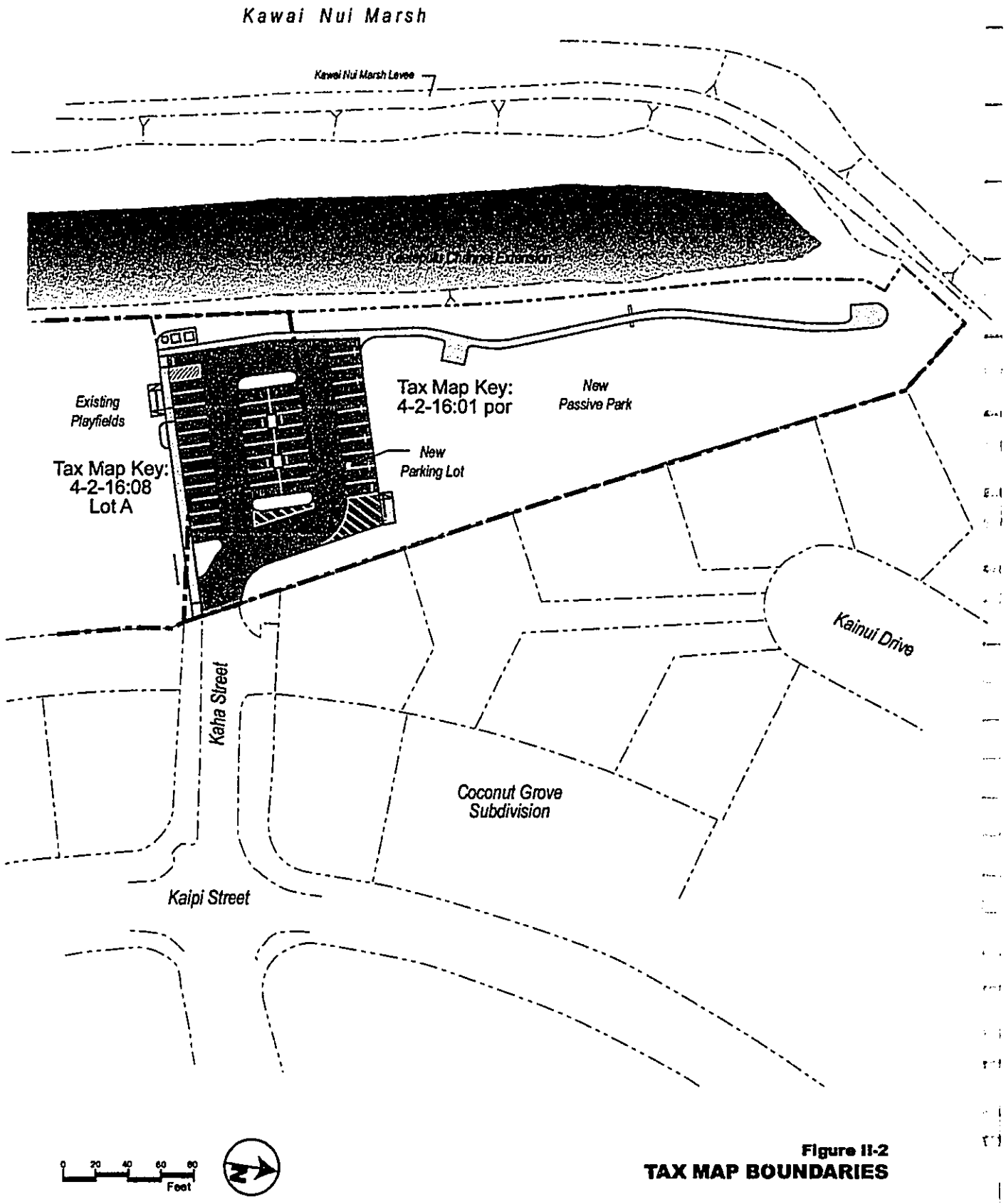


Figure II-2
TAX MAP BOUNDARIES

B. Technical Characteristics

(1) Use Characteristics

The proposed uses are improvements to the existing Kawai Nui Community Park. Improvements include 1) an asphalt concrete parking lot that will replace the temporary, gravel-based parking lot, and 2) landscape improvements to the adjacent triangular area that is currently unimproved open space. Parking lot features include 40 marked stalls, two of which will be restricted handicapped accessible stalls, canopy shade trees, irrigation system, a 6' wide concrete sidewalk along the southern side and a 4' wide sidewalk on the western side of the parking lot, a 24'-wide lockable chain vehicular entry gate, double bicycle storage rack, double drinking fountain, and a concrete pad for two *handicapped accessible* portable toilets and trash container. The southwestern corner of the parking lot will have a 13'-wide chain gate with lock to be used for maintenance vehicle access to the playfields. The northeastern corner of the parking lot will have an 18'-wide chain gate with lock to provide access for marsh levee and park maintenance vehicles. No lights will be provided in the parking lot or any area of the proposed improvements.

Landscape improvements to the adjacent triangular area will consist of a 4' wide meandering sidewalk that extends from the parking lot adjacent to the Kaelepulu Channel *Extension* and terminates at an existing rock monument identifying the Kawai Nui Flood Control Project, one picnic table positioned over a concrete pad, a park bench, large canopy shade trees, native accent trees, and interpretive planting on the mauka and makai edges, and grassed open areas in the central portion of the triangular area.

(2) Physical Characteristics

See 1" = 40' Scale Site Plan and Grading Plan attached following the appendices.

(3) Construction Characteristics

Construction will consist of removing existing concrete piles and *water or sewer pipes* that were used to define the parking lot, removing existing gravel fill, clearing and grubbing, and stockpiling usable mulch material. The area will be graded in accordance with the grading plan. Finished ground elevation of the parking lot will be approximately 6' above mean sea level. The parking lot will be constructed of 2" thick asphalt concrete over a 6" thick aggregate base course and 12" subbase course. For the open triangular area, acceptable soil will be imported for the fields and landscaped areas. An irrigation system that taps into the existing playfield irrigation system will be installed to irrigate landscape material in the parking lot and the newly landscaped triangular area.

(4) Utility Requirements

Utilities required will be limited to potable water for irrigation purposes and drinking fountains. No electricity or telephone lines will be installed.

(5) Liquid Waste

A concrete slab will be installed at the southwest corner of the parking lot for two *handicapped accessible* portable toilets. There are no plans to build permanent toilet facilities or to connect sewer lines to the existing sewerage system in the area.

(6) Solid Waste

Trash receptacles will be provided at the parking lot next to the portable toilets and along the meandering sidewalk. Trash disposal will be managed by the City and County of Honolulu, Department of Parks and Recreation.

(7) Access to Site

Access to the parking lot and landscaped triangle is at the western terminus of Kaha Street. A 16' wide lockable pipe gate controls access to the park's existing temporary parking lot. The pipe gate will be replaced with a lockable chain gate at the new entry to the parking lot.

C. Economic and Social Characteristics

(1) Estimated Cost and Time Phasing of Construction

The total estimated construction cost is approximately $350,000. This includes all work and materials to build the parking lot, sidewalks, portable toilet concrete pads, picnic table and bench, trash receptacle, bike storage rack, drinking fountain, landscape materials and other miscellaneous items.

Construction is estimated to take 6 months after bidding and award of contract. Construction activity will be divided into 2 phases. Phase 1 will involve the construction of the parking lot and phase 2 will involve the development of the passive park.

(2) Social Characteristics

As mentioned above, the proposed action was initiated because of pent up demand for parking at a recreational park that receives heavy use already. The playfields are used extensively during the weekends, particularly on Saturdays, with as many as 14 AYSO soccer teams. Participants ranging in age from 8 to 10 years use the fields for practice and tournament play. In addition, the more advanced, HYSA soccer league uses the park for

practice and games on Sundays. The playfields are also used for youth baseball practices during the baseball season.

The proposed project is an initiative originating from the efforts of the Kailua Vision 2000 Team. It was first proposed in January 2000 as a project limited to replacing the temporary gravel-based parking lot with a slightly larger grass parking lot using an interlocking polygeogrid product filled with topsoil in which grass would be grown. In the design development and review process, the grass parking lot concept was discouraged by the City Department of Parks and Recreation because of long-term maintenance problems, costs and safety issues. As a result, the parking lot has been redesigned as an all weather surface, asphalt concrete paved parking lot, complete with curbs and sidewalks. Further community input expanded the scope of the project to include landscaping the approximate 1.0 acre undeveloped, open triangular area as a passive park. Various schematic site plans and landscape plans were developed and reviewed by the Vision Team, <Neighborhood Board *delete*>, City agencies and neighboring residents, resulting in further refinements to the plan.

When completed, the proposed project will enhance the park and provide positive benefits to residents of the community. The Vision Team and design engineers have worked with the community and neighboring residents to address and mitigate specific concerns.

D. Environmental Characteristics

(1) Soils

According to a consultation letter prepared by Pacific Geotechnical Engineers, Inc., (see Appendix) the surface soils generally consist of light brown silty coralline sand. The ground surface is sparsely vegetated with grass.

Subsurface conditions were based on 3 borings conducted in the location of the proposed parking lot. Subsurface conditions generally consisted of fill material on the surface to a depth of approximately 5 feet. The fill consisted of 1 to 3 feet of loose to dense silty coralline sand underlain by very stiff silt and clay and loose to medium dense clayey coralline sand and gravel. The fill was underlain by lagoonal deposit consisting of very loose to medium dense silty coralline sand and gravel to a depth of approximately 10.5 feet. Ground water was encountered at depths ranging from 4.2 to 4.7 feet below existing grades or at an elevation of approximately 1 foot above mean sea level.

(2) Topography

The site's topography is relatively level with ground surface sloping gently from the north to the south. Surface elevations range from approximately 8 feet above mean sea level at the northernmost extent of the site to approximately 5 feet at the southern edge of the proposed parking lot. The project site is situated on fast land located at the northern boundary of the

Kawai Nui Marsh. The Kaelepulu Channel *Extension* separates the site's western boundary from a flood prevention levee that was constructed at the edge of the marsh by the U.S. Army Corps of Engineers as a flood control project in August 1966. The proposed parking lot will have a finished elevation of 6' above mean sea level.

(3) Surface runoff, drainage, and erosion hazard

The existing site consists of crushed basaltic gravel fill, coralline sand fill, sparse vegetation and weeds, and introduced ornamental landscaping that was planted on land adjacent to a few of the existing residences. Existing soil conditions have high permeability and slight erosion hazard. The proposed project will create approximately 17,500 square feet of impermeable surface. The drainage plans *originally called* for surface runoff to flow onto the adjacent landscaped playfields to the south and away from the Kaelepulu Channel *Extension. The use of rainfall runoff was given much thought in the design of the parking lot. The intent is not to waste rainwater that could wisely be used to irrigate the landscaping on site and to avoid continued use of potable water for irrigation. Since the publication of the Final EA, the parking lot drainage plan has been modified again. Now, half of the lot will drain toward the tree planters located in the middle of the parking lot and the other half will drain toward the playfields. The sidewalks on the playfield side of the parking lot have two open drain culverts topped with a steel plate that will allow runoff to flow into the playfields instead of back out to Kaha Street.* For the passive park, surface runoff will be captured in the open lawn area. Proposed landscape improvements will cover existing bare surfaces to help mitigate soil erosion and help to filter potential hydrocarbon pollutants that wash off the parking lot surface. However, should a major storm event occur *(see section (4) below)* runoff will flow to the channel. Should such an event occur, impacts would be minimized because the open lawn area and interpretive planting along the channel edge would help to mitigate surface runoff and erosion into the channel.

Median annual rainfall over urban Kailua averages around 40.6 inches (Station 791.3, Kalaheo Avenue). Kawai Nui Marsh Master Plan, page 2-8, State of Hawaii, Department of Land and Natural Resources, July 1994.

Using 40 inches as normal rainfall, the proposed improvements are designed to use runoff from the impermeable parking lot to irrigate the playfields and trees in the parking lot. This would conserve valuable potable water and use water that would otherwise flow into storm drains. Directing stormwater from the parking lot to the playfields is intended to filter waterborne particulate matter, such as road grime and rubber, before it permeates into the ground.

The proposed parking lot would create an impermeable surface of approximately 17,500 square feet. In comparison to the miles of existing roadways that border the area, this is a marginal increase.

(4) Federal FIRM, Flood Hazard District

According to the Flood Insurance Rate Map (FIRM), the project site has been determined to fall in Zone AH, defined as special flood hazard areas inundated by a 100-year flood with flood depths of 1 to 3 feet and a base flood elevation of 6 feet. Under normal circumstances, any habitable structures within this zone would need to be raised 6 feet above mean sea level. The Land Use Ordinance, Section 21-9.10, Flood Hazard Districts, indicates that public and private outdoor recreational facilities, lawn, garden and play areas are permitted uses in accordance with the underlying zoning district in floodways and flood fringe areas. In addition, off-street parking lots, including driveways, and walkways are exempt from flood hazard district requirements (Section 21-9.10-13 (a) (11).

According to the Urban Flood Control Study, Honolulu, Hawaii, prepared by the US Army Corps of Engineers in 1992, the last major storm event of this magnitude was called the "New Year's Eve Storm of 1987." This storm generated 17 inches in a 24-hour period over the 11.2 square mile Kawai Nui drainage basin. The ensuing flood was determined to have a probability of slightly higher than one-percent (equivalent to a 100-year flood). Flooding in the community of Coconut Grove was caused by floodwaters overtopping the Federal flood control levee that was built in 1966. The overtopping was aggravated by heavy vegetal growth in portions of the marsh that restricted water circulation and storage capacity, and channelized flood flows that ran perpendicular to the levee rather than toward Oneawa Channel. The 9-foot high, 6,850-foot long earth levee and drainage channel constructed in 1966 held back stormwater moving through the channel until the 1987 storm. In 1997, a 4-foot high wall was added to the top of the levee as added protection. According to the Corps of Engineers and local resident Alan Heu, the area has not flooded since the 1987 New Year's Eve flood. Major storm events have caused flooding in the area. Should such catastrophic rainfall blanket the region, it would be impossible to hold 100% of stormwater runoff.

(5) Other information pertinent to the Special Management Area

None.

III. AFFECTED ENVIRONMENT

A. Brief description of subject site in relation to surrounding area and the description of the surrounding area. Existing land uses, general plan and development plan land use designations, zoning and unique features.

The subject site is part of the existing Kawai Nui Community Park. It is bound by *townhomes* on its eastern boundary and the Kawai Nui Marsh on its western boundary. The proposed project is consistent with the goals, objectives and policies of the General Plan. The park is designated Preservation according to the Development Plan Land Use Map. Under the Development Plan Preservation designation, lands used for national, state or city parks (Section 24-1.3 (k)(9) is an established land use category. The park is zoned P-1 Restricted Preservation. Within the P-1 Restricted Preservation District, all lands that fall in a state-designated conservation district are governed by appropriate state agencies, in this case, the State Department of Land and Natural Resources. The purpose of the preservation district is to preserve and manage major open space and recreation lands and lands of scenic and other natural resource value. The proposed project is consistent with the recreational use of the land in accordance with these guidelines for the preservation district. The existing park and proposed improvements make good use of marginal land adjacent to an important habitat for native endangered waterbirds and a natural and cultural resource.

There is a pent up demand for parking at a recreational park that receives heavy use. According to Ms. Cindy Turner (a Kailua resident) and Mr. Alan Heu (also a Kailua resident, as well as a youth soccer advocate), the playfields are used extensively during the weekends, particularly on Saturdays, with as many as 14 AYSO soccer teams. Participants ranging in age from 8 to 10 years use the fields for practice and tournament play. The AYSO league has two seasons: the Fall season, which runs from mid-August until mid-November, and the Spring season, which runs from January through February. On Saturdays, the first game starts at 8:00 am and the last game starts at 3:30 pm. In addition, the more advanced, HYSA soccer league uses the park for practice and games on Sundays. In this league, as many 5 games may be scheduled, involving 10 teams whose participants range in age from 12 to 18 years. The playfields are also used for youth baseball practices during the baseball season.

The existing gravel-based parking lot can hold only 20 cars or so. It is common for cars to spill over onto adjacent local streets, particularly during the transition period when games are in progress and participants for the next scheduled games arrive to warm up. Mr. Heu counted approximately 60 cars during one Saturday event in October 1999. Improvements to the parking lot will accommodate only a portion of peak period demand by providing 40 marked stalls within the confines of the recreational area. Park users will continue to use the local streets, but the impact on these streets will diminish accordingly.

The project site falls within the State Conservation District, Protective Subzone. Under this subzone, the existing park is an identified land use, i.e., P-6 Public Purpose Uses for recreational facilities. A CDUA permit was approved for the park in 1978 (CDUA OA-2/28/78-1036) and another CDUA permit was approved to subdivide the 4.4 acre park from the larger Kawai Nui Marsh parcel in 1994 (CDUA OA-11/5/93-2679). The proposed project, i.e., the parking lot, is considered an "accessory structure", (P-10 Structures, Accessory). Under this category, construction of structures accessory to existing facilities as identified in the exempt classes established in section 11-200-8, are allowed and require no permit from the department or board. A CDUA permit will be filed with DLNR upon receipt of the SMP to request that the project be considered an "accessory structure" that does not require a permit (Chapter 13-5, Hawaii Administrative Rules, Section 13-5-22, P-10 Structures, Accessory).

See Figure III-1, Land Use Controls.

B. Project site in relation to publicly owned or used beaches, parks and recreation areas; rare, threatened, or endangered species and their habitats; wildlife and wildlife preserves; wetlands, lagoons, tidal lands and submerged lands; fisheries and fishing grounds; other coastal/natural resources.

The project site is located on property owned by the City and County of Honolulu and used as a recreation park. It is located on fast land adjacent to the Kawai Nui Marsh, the largest remaining wetland in Hawaii and the subject of an Environmental Restoration Project sponsored by the U.S. Army Corps of Engineers, Honolulu district in cooperation with the State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife. The proposed parking lot and landscaping improvements will provide the general public with convenient parking and access to the wetland resource without disrupting the natural resources and ecosystem of the marsh. It should be noted that the Wildlife Habitat Restoration Project and other recommendations discussed in the 1994 Kawai Nui Marsh Master Plan prepared by the Department of Land and Natural Resources involves projects and improvements that occur primarily on the southern portion of the approximate 750 acre marsh, away from the proposed project site. Provision of the off-street parking lot will also reduce the number of vehicles parking on street on Kaha and Kaipii Streets during organized sporting events.

Tim J. Ohashi, Certified Wildlife Biologist, conducted a field survey on May 13, 2000, to assess the wildlife resources found on and adjacent to the project site. Common mynas, zebra doves, spotted doves and the federally listed black-necked stilt were seen foraging in the soccer field. Three stilts were present during the site visit. On the adjacent vacant lot, a flock of about 30 red avadavats was foraging in grass seeds. Within the canal, there was a pair of feral mallards with one downy chick and a mallard hybrid hen with a brood of four ducklings. No endangered koloa or coots were found, although they are in the area. Because it was spring, no Pacific golden plovers were seen on the field, although they are expected to

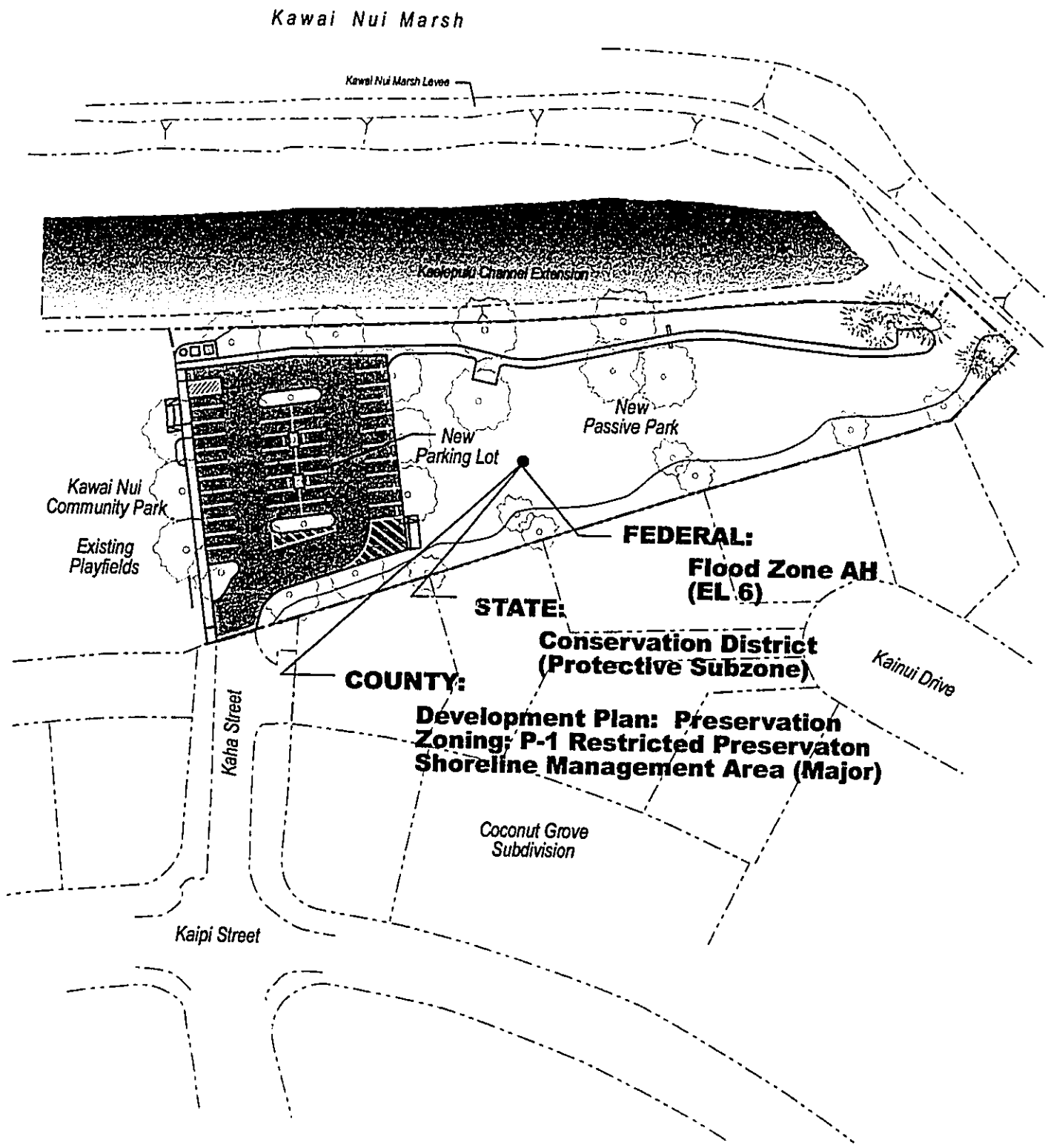


Figure III-1
Land Use Controls

be present during the fall and winter months. The following is a list of birds observed during the site visit.

- Java sparrow (*Padda oryzivora*)
- Red avadavat (*Amandava amandava*)
- Spotted dove (*Streptopelia chinensis*)
- Common myna (*Acridotheres tristis*)
- Zebra dove (*Geopelia striata*)
- House finch (*Carpodacus mexicanus*)
- English sparrow (*Passer domesticus*)
- Red crested cardinal (*Paroaria coronata*)
- Mallard (*Anas platyrhynchos*)

Black necked stilt (*Himantopus himantopus knudseni*) – The stilt is a federally listed endangered species. Stilts use a variety of aquatic habitats including fresh, brackish and salt-water areas. Stilts are opportunistic feeders. Upland sites near stilt aquatic habitats may be used by stilts during periods of rainfall or during irrigation. It is not unusual to see stilts on lawns and playgrounds within the Kailua wetland complex, which includes Nuupia Ponds, Kawai Nui Marsh, Kaelepulu Pond and associated canals and waterways.

The parking lot improvement project is proposed on a site that is already being used as a parking lot. Endangered stilts use the adjacent field but they appeared to be habituated to human activity and will likely continue to use the field if the project is approved. Since the project does not entail modifications to the canal, no affects are expected to the waterfowl using the canal except the usual human disturbance they are probably accustomed to in such an urban area.

Winona P. Char of Char and Associates, conducted an assessment of the botanical resources at the Kawai Nui Community Park on July 26, 2000. The objectives of the study were to 1) provide a general description of the vegetation on the areas planned for improvements, 2) search for threatened and endangered species as well as species of concern, and 3) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

The existing parking lot supports low mats of Bermuda grass, khaki weed (Alternanthera pungens), creeping indigo, (Brachiaria subquadriparia), Guinea grass (Panicum maximum), and puahilahila or sensitive plant (Mimosa pudica var. unijuga). Low patches of wedelia (Spagneticola trilobata) are common along the canal-side of the parking lot. Plant cover is about 40%.

To the north of the existing parking lot is an unmaintained, overgrown, weedy area with an existing gravel road. A layer of mulch has been spread on some parts of this site. Vegetation cover is about 60% with patches of white-flowered Spanish needle (Bidens alba var. radiata),

swollen fingergrass (Chloris barbata), pink blindweed vine (Ipomoea triloba), and khaki weed abundant. Other weedy species occurring here occasionally include creeping indigo, false mallow (Malvastrum coromandelianum), hairy spurge (Chamaesyce hirta), graceful spurge (Chamaesyce hypericifolia), prickly sida (Sida spinosa), Heliotropium, Johnson grass (Sorghum halpense), and Boerhavia coccinea. A few young monkeypod saplings (Samanea saman), and koa haole shrubs (Leucaena leucocephala), 2 to 3 feet tall, are also found in this area.

Where the unmaintained area abuts several homes and a chain link fence, there are plantings of coconut (Cocos nucifera) and other palms. Scarlet fruited gourd or coccinia (Coccinia grandis) vines are locally abundant along the fence line.

The project site is dominated by introduced, mostly weedy species. Introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is Cook's discovery of the islands in 1778. This is not surprising as the site has been disturbed and in use for a long time. The only native plant observed was 'uhaloa (Waltheria indica). The 'uhaloa is indigenous, that is, it is native to Hawai'I and elsewhere.

None of the plants found on the site is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service, 1999). No wetlands or wetland vegetation (Reed 1988) occur on the site proposed for improvements. Given the above, the proposed project is not expected to have a significant negative impact on the botanical resources. All of the plants can be found in similar disturbed, lowland habitats throughout the Hawaiian Islands. There are no botanical reasons to impose any restrictions, conditions or impediments to the proposed plans.

C. Relation to historic, cultural, and archaeological resources.

Cultural Surveys Hawaii, Inc., conducted an archaeological inventory survey for the proposed project at the Kawainui Community Park, in the *Ahupua`a* of Kailua, district of Ko`olaupoko, Island of O`ahu. The inventory survey consisted of pedestrian inspection and sub-surface testing of the proposed construction site, historical document and oral history research for the *Ahupua`a* of Kailua in general, and more specifically of the project area and its vicinity. No archaeological sites were observed during the pedestrian field inspection. Historic research indicated that if there were significant utilization (i.e., agricultural or habitation) along this area of Kawainui Marsh, remnants of this activity most likely would not have survived the extensive reworking of this area in association with the drainage engineering projects for Kawainui Marsh and the associated (and adjacent) Oneawa Drainage Canal. Based on the results of historical document research, pedestrian field inspection, and sub-surface testing of the project area, it appears that there are no historic properties within the project area and the proposed park improvements will have no effect on historic properties. No further historic preservation work is recommended for the project.

Although the Kawai Nui Marsh is an area of cultural significance to the Hawaiian people, the specific project area is an extensively altered parcel on the margin of the marsh. During field inspection, no surface historic or archaeological sites associated with traditional Hawaiian occupation were observed in any portion of the project area. Subsurface investigations identified thick (1.5m) landfill associated with the post-1940 construction of the Kawai Nui drainage system. The fill covers the project area which virtually eliminates the possibility of any remaining cultural site. If there were traditional practices on the parcel, it is unlikely that artifacts would have survived the extensive reworking of the area that occurred during engineering projects for Kawai Nui Marsh and the adjacent Oneawa Drainage Channel.

Documentary research indicates that the project area was not used in any notable manner. Long-time residents who participated in the community-based vision process did not recall significant historic practices on or uses of the area, nor did they raise objections to the proposed improvements. Nonetheless, the proposed improvements would help facilitate access to the marsh and provide opportunities for native Hawaiians to engage in cultural practices. The many people who are currently using the park facilities, especially children, youth, and families, are creating a new set of traditions and memories associated with the site, whether through formal, programmed activities (the athletic games) or through informal appreciation of a newly created passive park.

D. Coastal views from surrounding public viewpoints and from the nearest coastal highway across the site to the ocean or to coastal landform.

The project site is not visible from surrounding public viewpoints or from any coastal highway. Kawai Nui Marsh is regarded as a scenic vista and view shed. The proposed action will not adversely affect view opportunities of the marsh. A few of the residents adjacent to the area proposed for the passive park were concerned about potential loss of their panoramic view opportunities overlooking the marsh that may result with the introduction of large trees and vegetation. Based on their input, the design of the landscape plan was refined to minimize potential view obstructions.

E. Quality of receiving waters and ground water (including potable water) resources. Describe effects on the groundwater recharge cycle within the groundwater control area, show existing and proposed well locations with pumping estimates. Describe effects on receiving waters – streams and ocean waters.

The proposed site is adjacent to the Kaelepulu Channel Extension that drains *to the Kaelepulu Stream and drainage canal and discharges at Kailua Beach. The Oneawa Channel, which forms the northern boundary of the project site is not connected to the*

Kaelepulu Channel Extension. Short-term construction activity and long-term use of the site for parking and passive park are not anticipated to adversely affect the quality of these receiving waters. Soil erosion during construction is not anticipated because of the flat terrain. Erosion control measures and best management practices will be implemented during construction. All construction projects, including this one, are built from drawings that contain specifications, procedures, and measures to be followed by the contractor. These include the following :

Construction Notes:

- *No contractor shall perform any construction operation so as to cause falling rocks, soil or debris in any form to fall, slide or flow into existing city drainage systems, or adjoining properties, streets or natural watercourses. Should such violations occur, the contractor may be cited and the contractor shall immediately make all remedial actions necessary.*
- *The contractor shall be responsible for conformance with the applicable provisions of the water quality and water pollution control standards contained in Hawaii Administrative Rules, Chapter 11-54, "Water Quality Standards" and Chapter 11-55, "Water Pollution Control", as well as Chapter 14 of the Revised Ordinances of Honolulu, as Amended. Best Management Practices shall be employed at all times during construction.*

Temporary Erosion Control Measures:

- *Temporary erosion control measures shall be submitted by the contractor for approval by the engineer prior to start of construction.*
- *Sedimentation basins, filter inlets, cut-off swales and diversion dikes shall be provided as necessary.*
- *Areas to be cleared, grubbed, and exposed at one time shall be kept to the smallest area possible.*
- *Temporary ground cover shall be planted or a sill tackifier spread over exposed areas not being worked on.*
- *Temporary erosion controls should not be removed before permanent erosion controls are in place and established.*
- *All measures to control erosion (including silt fences) and other pollutants shall be in place before any safety moving operations are initiated.*

After implementation, runoff from the parking lot will be directed to the playfields to the south where it will filter through the playfield lawns. The landscaping and grading plan for the triangular area will be designed to contain storm water on the site. Storm water runoff into the adjacent channel is unlikely and would only occur during extremely heavy rainfall events. No effects on the groundwater recharge cycle are anticipated. No wells are proposed for the project site.

F. Include suitable and adequate location and site maps.

Location maps, site plans, landscaping plans and digital photos of the existing site are included in the report. Large scale construction drawings, i.e., site plan, grading plan and landscape plan accompany this report.

IV. PROJECT IMPACTS AND ALTERNATIVES CONSIDERED

A. Impacts of the project relative to the Coastal Zone Management objectives and policies (Section 205A-2, HRS) and the Special Management Area guidelines (Section 25-3.2 ROH) are presented below.

1. Coastal Zone Management objectives and policies (Section 205A-2) applicable to the proposed project are cited and discussed below:

(b) Objectives
(1) Recreational resources;
(A) Provide coastal recreational opportunities accessible to the public.

The proposed project involves accessory improvements to an existing public park that provides recreational opportunities accessible to the public.

(c) Policies
(1) Recreational resources;
(A) Improve coordination and funding of coastal recreational planning and management; and

(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

The proposed project, an initiative of the Vision 2000 program for the Kailua area, allocates public funds for the improvement of an existing public park that has been in existence since 1978.

It enhances an existing recreational park by providing permanent off-street parking facilities and improves public access to an area that is suitable for public recreation.

(2) Historic resources;
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

The archaeological study indicated that it appears that there are no historic properties within the project area and the proposed park improvements will have no effect on historic properties. No further historic preservation work is recommended for the project.

(3) Scenic and open space resources;
(D) Encourage those developments which are not coastal dependent to locate in inland areas.

The proposed improvements to the existing park take place in an inland area that is not coastal dependent.

(6) Coastal hazards;
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
(D) Prevent coastal flooding from inland projects; and
(E) Develop a coastal point and nonpoint source pollution control program.

According to the Flood Insurance Rate Map (FIRM), the project site has been determined to fall in Zone AH, defined as special flood hazard areas inundated by a 100-year flood with flood depths of 1 to 3 feet and a base flood elevation of 6 feet. Under normal circumstances, any habitable structures within this zone would need to be raised 6 feet above mean sea level. According to the Land Use Ordinance, Section 21-9.10, Flood Hazard Districts, public and private outdoor recreational facilities, lawn, garden and play areas are permitted uses in accordance with the underlying zoning district in floodways and flood fringe areas. In addition, off-street parking lots, including driveways, and walkways are exempt from flood

hazard district requirements (Section 21-9.10-13 (a) (11). Erosion control measures and best management plans will be used during construction to minimize point and nonpoint source pollution into the adjacent Kaelepulu Stream.

2. Shoreline Management Area Review Guidelines (Section 25-3.2) that are relevant to the proposed project are discussed below:

(a) All development in the special management area shall be subject to reasonable terms and conditions set by the council to ensure that:

(1) Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas and natural reserves is provided to the extent consistent with sound conservation principles;

(2) Adequate and properly located public recreation areas and wildlife preserves are reserved;

(3) Provisions are made for solid and liquid waste treatment, disposition and management which will minimize adverse effects upon special management area resources; and

(4) Alterations to existing land forms and vegetation; except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation or failure in the event of earthquake.

The proposed project is consistent with the guidelines expressed above. The construction of a permanent parking lot to replace the existing temporary parking lot and landscape improvements to the undeveloped portion of the existing park will enhance access opportunities to an existing recreation area. The City and County will manage solid and liquid wastes. Trash receptacles will be provided as standard procedure for all county parks and two portable toilets will continue to be provided, as is now the practice. Existing landforms are characterized by flat terrain and will receive minimal alterations. The existing level topography will be grubbed and regraded. Suitable subbase and base course material imported for the parking lot and suitable soils will be imported for the lawn and landscaped areas of the triangular area.

(b) No development shall be approved unless the council has first found that:

(1) The development will not have any substantial, adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interest. Such adverse effect shall include, but not be limited to, the potential cumulative impact of individual

developments, each one of which taken in itself might not have a substantial adverse effect and the elimination of planning options;

(2) The development is consistent with the objectives and policies set forth in Section 25-3.1 and area guidelines contained in HRS Section 205A-26;

(3) The development is consistent with the county general plan, development plans and zoning. Such a finding of consistency does not preclude concurrent processing where a development plan amendment or zone change may also be required.

The proposed project is consistent with the guidelines expressed above. The proposed project replaces a temporary parking lot with a permanent parking lot at an existing community park. Provisions are made to direct runoff from the parking lot to the grass open fields and landscaped areas and away from the Kaelepulu Channel Extension. No substantial, adverse environmental or ecological effects are anticipated. The project is also consistent with relevant objectives and policies of Section 25-3.1 as well as the county general plan, development plans and zoning.

(c) The council shall seek to minimize, where reasonable:

(1) Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon;

(2) Any development which would reduce the size of any beach or other area usable for public recreation;

(3) Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams which the special management area and the mean high tide line where there is no beach;

(4) Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast;

(5) Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.

The proposed project is consistent with the guidelines expressed above. Implementation will not involve dredging or filling operations of any water body and the proposed action is not relevant to beach alteration. The project enhances public access opportunities to an existing public park that is adjacent to a marsh. It does not interfere with the line of sight from a major highway to the sea and it would not affect water quality, bodies of water used for fishing, wildlife habitats or agricultural uses of land.

B. Alternatives Considered

The proposed project calls for the construction of a permanent parking lot and landscape improvements to the adjacent triangular area at the existing Kawai Nui Community Park. Alternatives to the proposed project include 1) no action, and 2) alternative design. The following is a discussion of the alternatives considered and the recommended course of action.

(1) No Action

The no action alternative would be counterproductive to the desires of the community as expressed by the initiative put forward by the Vision 2000 Team for Kailua. The users of the park, *which includes as many as 24 youth soccer teams and their parents will continue to use the temporary gravel-based parking lot. Demand for parking will continue to be unmet. Cars will continue to spill over onto adjacent local streets, creating congested conditions during weekends.* Members of the community will not enjoy the adjoining undeveloped open space as a passive park.

(2) Alternative Design

In January 2000, the initial design idea proposed by the Vision 2000 Team for improving the park was to build a parking lot using a new interlocking polygeogrid product filled with topsoil in which grass would be grown. Subsequent meetings of the Vision Team revised the plan to where the primary parking lot would be constructed with gravel topping while the other half would use grass blocks for over flow parking. Although environmentally more appealing than a standard asphalt parking lot, the grass block parking lot concept was opposed by the City Department of Parks and Recreation for safety and maintenance reasons and the scope of work was revised to build an asphalt parking lot. Further community input increased the scope of work by adding landscaped improvements to the adjoining triangular area to create a passive park.

(3) Recommended Course of Action

Through the planning and design process and community input from the Vision 2000 Team, <the Neighborhood Board *delete*>, and residents adjacent to the proposed project, the design of the proposed project has evolved as the recommended course of action. Among the alternatives considered, the proposed project is consistent with land use controls for the site and has the support of the Kailua community.

V. MITIGATION MEASURES

Short-term environmental impacts would be associated with construction activity during the 6-month construction period. Construction will involve the use of heavy machinery for grading and trucks for hauling material to and from the site. Construction noise would be mitigated with the incorporation of State Department of Health construction noise limits and curfew times. Dust control barriers erected adjacent to the *townhomes* and routine watering will be employed to control fugitive dust. Erosion control barriers and best management practices will be used to mitigate potential erosion during grading operations and installation of landscaping *(see Chapter III, E)*.

Long-term environmental impacts are not anticipated. The construction of the 0.4-acre parking lot and sidewalks would increase the impermeable surface of the existing park by about 7 percent. Runoff from the parking lot will be directed to the open play fields on the southern side of the parking lot or planting strip in the middle of the parking lot. The lawn and landscaped areas will function as siltation basins and help filter hydrocarbon pollutants that may be borne by surface water runoff.

Residents adjacent to the park have expressed concerns about potential loitering and undesirable behavior at the park during the night. As a continuation of current practice, the park will be closed at night and the parking lot entrance locked.

VI. Determination

Based on the information described herein, the proposed project is not expected to result in significant social, economic, cultural or environmental impacts. Consequently, a finding of no significant impact is warranted pursuant to the provisions of Subchapter 6 of Chapter 11-200, HAR.

VII. Findings, and Reasons Supporting the Anticipated Determination

In accordance with the significance criteria on Section 11-200-12 of Title 11, Chapter 200, this EA has determined that the proposed project will have no significant adverse impact on the environment.

Significant criteria supporting the anticipation of a Finding of No Significant Impact (FONSI) are presented below:

The project does not involve an irrevocable commitment to loss or destruction of any natural or cultural resource.

No loss or destruction of any natural or cultural resource will be involved. In contrast, the proposed project involves enhancement and improvements to an existing natural resource, a community park that has been in existence since 1978. The archaeological study indicated that it appears that there are no historic properties within the project area and the proposed park improvements will have no effect on historic properties. No further historic preservation work is recommended.

The project does not curtail the range of beneficial uses of the environment.

The proposed project is located on the fringe of a major wetland, is zoned for conservation use and is within the flood hazard area. The existing park is a permitted use according to State and County land use controls and is allowed within the flood hazard area. The proposed improvements do not curtail the range of beneficial uses of the environment because land use controls prevent it from being used for anything else, except perhaps a natural or scenic resource. In this case, the benefits to the community outweigh its use as a natural or scenic resource.

The project does not conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.

The proposed project is consistent with the environmental policies, goals, and guidelines defined in Chapter 344, HRS. The proposed project helps to enhance, and thereby conserve a natural resource, i.e., a community park, for public recreational use. (Section 344-3, (1) and 344-4 (4)).

The project does not substantially affect the economic or social welfare of the community or State.

The proposed project will not significantly affect the economic welfare of the community or State; however, the proposed park improvements will have a direct positive effect on the social welfare of the Kailua community by improving park facilities for the larger community to enjoy. In addition, providing additional off-site parking would help to reduce the amount of cars parking on street during times of peak park use.

The project does not substantially affect public health.

The proposed project will be performed in accordance with all state, and local regulations to ensure the protection of human health and the environment. Potential impacts on public health are considered insignificant and temporary. Any impacts from the project, which may affect public health, will be mitigated by measures defined in this report.

The project does not involve substantial secondary impacts, such as population change or effects on public facilities.

The proposed action involves improvements to an existing public park and is not expected to cause substantial secondary impacts, such as population changes or effects on public facilities.

The project does not involve a substantial degradation of environmental quality.

The proposed project does not involve a substantial degradation of environmental quality. In contrast, proposed improvements will replace an existing temporary gravel-based parking lot with a permanent lot designed to meet current standards and landscaping in an area that is barren and sparsely vegetated with weeds. The subject site is not environmentally pristine and does not have any biological resources of significance.

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

This project will have a positive cumulative effect on the environment by enhancing an existing community recreational resource. The action, in itself, will not lead to a commitment for larger actions.

This project does not affect any rare, threatened, or endangered species, or its habitat.

The proposed project site has been previously disturbed and is currently used for parking and does not contain any endangered flora. The Black necked stilt (*Himantopus himantopus knudseni*), a federally listed endangered species have been observed to use the adjacent playfield but they appeared to be habituated to human activity and will likely continue to use the field after the improvements are made. Since the project does not entail

modifications to the canal, no affects are expected to the waterfowl using the canal except the usual human disturbance they are probably accustomed to in such an urban area.

This project does not detrimentally affect air or water quality or ambient noise levels.

The potential impacts on air, water, and noise levels will be insignificant and limited to the short duration of the project. Any potential impacts from the project will be mitigated by measures defined in this report.

This project does not affect nor is it likely to suffer damage by being located in an environmentally sensitive area.

The proposed project site is located adjacent to the Kawai Nui Marsh, an environmentally sensitive area. Portions of the park has been subdivided from the larger marsh and does not fall within the boundaries of the marsh for which improvements are proposed in its resource management plan. In fact, most of the resource management proposals are on the southern end of the marsh, away from the proposed project site. The proposed project is not anticipated to adversely affect the marsh. Any potential impacts from the project will be mitigated by measures defined in this report.

This project does not substantially affect scenic vistas and viewplanes identified in county or State plans or studies.

The Kawai Nui Marsh is identified as a significant vista and view shed. The proposed project will not adversely affect the scenic vistas provided by the marsh. The project itself continues to provide open space view opportunities and visual improvements with the addition of landscaping in an area currently void of landscaping.

This project does not require substantial energy consumption.

Energy, in the form of gasoline and diesel fuel will be consumed during construction. However, the amount of energy expended is not considered substantial.

VIII. Comments and Responses to the Draft Environmental Assessment

The availability of the Draft EA was published in the August 23, 2000 Environmental Notice with a public comment deadline of September 22, 2000. The following comment letters were received during the Draft EA 30-day comment period. Corresponding response letters are attached. A list of the commenting agency, organization or individuals that commented in writing and a record of telephone calls are provided below.

Party	Via	Date	Comment
Ralph & Virginia Turner	Telcon	7 Sept	Supports project
Unidentified woman	Telcon	7 Sept	Requests handicap access, wants pedestrian access when park closed
Flip Aman	Telcon	7 Sept	Concerned with traffic impact on Kaha/Kaipii Streets, feels money better spent on traffic improvements
Joe Correa	Telcon	7 Sept	Supports project
DOT Hayashida	letter	29 Aug	No impacts to transportation facilities
OEQC	letter	1 Sept	Print on two sides, request DLNR concurrence on archaeological report
Libby Ellet Tomar	email	8 Sept	Wants flat topped speed table added to center of parking lot, would like dogs allowed, questioned location of sidewalks, concerned with runoff
Mr. McDiarmid	Telcon	9 Sept	Should address traffic at Kaha/Kaipii first. Concerned with parking lot runoff.
Army Corps of Engineers	Telcon	28 Aug	Contacted J Dobinchik. Corps has EA and is processing it. Will contact us with comments.
Div of Forestry and Wildlife, M. Buck	letter	1 Sept	Project will not affect DOFAW's programs. No objections to project.
DLNR, Uchida	letter	13 Sept	No comments other than DOFAW's
BWS, Jamile	letter	19 Sept	Identifies meters and notes requirements for review.
UH Env Center, Rappa	letter	25 Sept	Discuss demand, rainfall, erosion control and BMPs, cultural impacts
Windward Soccer Club, Yamashita	letter	16 Sept	Welcomes project, request large canopy trees restricted to perimeter and outside play area.
Kawai Nui Heritage	letter	22 Sept	Incorrect waterbody name and drainage

Foundation, Miller			pattern, concern with parking lot runoff.
Kailua Neighborhood Board No. 31, Corcoran	letter	21 Sept	Incorrect statement that KNB was consulted. Challenges vision process and violation of sunshine law.

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2550 Campus Road • Crawford 317 • Honolulu, Hawai'i 96822
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September 25, 2000
EA: 243

Mr. Howard Mau
City and County of Honolulu
Department of Design and Construction
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Mau:

Kawai Nui Community Park Parking Lot and Landscape Improvements
Draft Environmental Assessment
Koolaupoko, Oahu

The City and County of Honolulu Department of Design and Construction proposes to replace an existing gravel-based parking lot with a permanent asphalt concrete parking lot and create a passive park at the adjoining open space parcel. The project is located at the existing Kawai Nui Community Park (Kaha Park) on the northern fringe of Kawai Nui Marsh. The purpose of this project is to enhance the recreational value of the existing park. This review was conducted with the assistance of Sherri Hiraoka, Environmental Center.

Current and projected park user volumes would be helpful in determining both the need for these park improvements and the full effect on the environment. It is possible that improved facilities will draw additional users to the park, and while that may be a positive effect, it may also add strain on the natural resources of the area. For example, additional automobiles may increase the quantities of vehicular emissions and residual particles that are carried into the ground and the nearby Kaelepulu Channel.

In several sections of the EA, most notably on page II-7, section II D-3 and page III-6 Section III E, it states that major storm events may lead to runoff to the Kaelepulu Channel, yet no rainfall data is provided. Some idea as to the frequency of "major storms" or "heavy rainfall" would be very helpful in determining the potential impacts of runoff to the receiving waters. The Windward side of the island does occasionally receive large amounts of rain. The Coconut Grove area has been subjected to floods in the past after such rains. Thus, a more complete discussion of rainfall is warranted in the EA.

The EA states that erosion control measures and Best Management Practices (BMP) will be implemented during construction (page III-6, section E). It may be helpful to cite some of the erosion controls and BMPs planned.

The nearby Kawai Nui Marsh has been identified as an area of cultural significance. Noting this, we suggest that local Hawaiian organizations be contacted to determine that these proposals are in agreement with their needs. We acknowledge that a cultural survey has been done, but the investigation by Cultural Surveys Hawaii seems to focus mainly on archaeological significance, and not current or traditional practice. It was not clear if the civic club and visioning process included this aspect of social impact.

The Archaeological Inventory Survey was omitted from one of the copies of the EA that was sent to us. It may be possible that this appendix was also left out of other copies that you circulated.

Finally, we suggest that the final Environmental Assessment be printed double-sided to reduce the amount of paper used. Thank you for the opportunity to comment on this draft Environmental Assessment.

Sincerely,

Peter Reppa
Environmental Review Coordinator

cc: Jeffrey Lee, Honolulu Department of Planning & Permitting
Glenn Kimura, Kimura International
OEQC
James Moncur, WRRC
Sherri Hiraoka, Environmental Center

KIMURA INTERNATIONAL

Monday, October 02, 2000

Mr. Peter Rappa
Environmental Review Coordinator
University of Hawaii
Environmental Center
2550 Campus Road, Crawford 917
Honolulu, HI 96822

Dear Mr. Rappa:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 25, 2000 regarding the above-mentioned project. We offer the following responses to your comments:

Need for the Project Relative to Current and Projected Park User Volumes

The proposed action was initiated because of pent up demand for parking at a recreational park that receives heavy use already. According to Ms. Cindy Turner (a Kailua resident) and Mr. Alan Heu (also a Kailua resident, as well as a youth soccer advocate), the playfields are used extensively during the weekends, particularly on Saturdays, with as many as 14 AYSO soccer teams. Participants ranging in age from 8 to 10 years use the fields for practice and tournament play. The AYSO league has two seasons: the Fall season, which runs from mid-August until mid-November, and the Spring season, which runs from January through February. On Saturdays, the first game starts at 8:00 am and the last game starts at 3:30 pm. In addition, the more advanced, HYSA soccer league uses the park for practice and games on Sundays. In this league, as many 5 games may be scheduled, involving 10 teams whose participants range in age from 12 to 18 years. The playfields are also used for youth baseball practices during the baseball season.

The existing gravel-based parking lot can hold only 20 cars or so. It is common for cars to spill over onto adjacent local streets, particularly during the transition period when games are in progress and participants for the next scheduled games arrive to warm up. Mr. Heu counted approximately 60 cars during one Saturday event in October 1999. Improvements to the parking lot will accommodate only a portion of peak period demand by providing 40 marked stalls within the confines of the recreational area. Park users will continue to use the local streets, but the impact on these streets will diminish accordingly.

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Tel (808) 944-5545 • Fax (808) 941-5999

In addition to increasing the availability of parking, a permanent parking lot would improve existing conditions. Today, the lot consists of exposed sandy soil and gravel. During the rainy season, it tends to become muddy as a result of vehicular traffic. Muddy stormwater has the potential to work its way into storm drains located at the Kaha and Kaipii Street intersection. These storm drains discharge into Oneawa Canal (Kawai Nui Canal), which eventually discharges into the ocean. Care has been taken in designing the parking lot to take advantage of runoff by using it as a natural source of irrigation for trees in the parking lot and the open playfields. During the dry season, cars kick up dust and other airborne particulates.

It is also likely and, in fact, desirable for the proposed improvements to attract more users during off peak periods. The proposed passive park will visually and functionally enhance an area that contains scattered clumps of weeds. Taking all of these factors into consideration, the proposed project serves a justifiable community need. It will benefit hundreds of soccer and baseball participants, as well as other members of the neighborhood who will be able to enjoy the recreational opportunities provided by the proposed improvements.

Rainfall and Flooding

Our discussion of potential runoff to Kaelepulu Channel in the event of major rainfall events was intended to convey the impossibility of holding 100% of the stormwater should there be a catastrophic rainfall that blankets the region. According to the Urban Flood Control Study, Honolulu, Hawaii, prepared by the US Army Corps of Engineers in 1992, the last major storm event of this magnitude was called the "New Year's Eve Storm of 1987." This storm generated 17 inches in a 24-hour period over the 11.2 square mile Kawai Nui drainage basin. The ensuing flood was determined to have a probability of slightly higher than one-percent (equivalent to a 100-year flood). Flooding in the community of Coconut Grove was caused by floodwaters overtopping the Federal flood control levee that was built in 1966. The overtopping was aggravated by heavy vegetal growth in portions of the marsh that restricted water circulation and storage capacity, and channelized flood flows that ran perpendicular to the levee rather than toward Oneawa Canal. The 9-foot high, 6,850-foot long earth levee and drainage canal constructed in 1966 held back stormwater moving through the canal until the 1987 storm. In 1997, a 4-foot high wall was added to the top of the levee as added protection. According to the Corps of Engineers and local resident Alan Heu, the area has not flooded since the 1987 New Year's Eve flood.

Median annual rainfall over urban Kailua averages around 40.6 inches (Station 791.3, Kalaheo Avenue). *Kawai Nui Marsh Master Plan*, page 2-8, State of Hawaii, Department of Land and Natural Resources, July 1994.

Using 40 inches as normal rainfall, the proposed improvements are designed to use runoff from the impermeable parking lot to irrigate the playfields and trees in the parking lot. This would

conserve valuable potable water and use water that would otherwise flow into storm drains. Directing stormwater from the parking lot to the playfields is intended to filter waterborne particulate matter, such as road grime and rubber, before it permeates into the ground.

The proposed parking lot would create an impermeable surface of approximately 17,500 square feet. In comparison to the miles of existing roadways that border the area, this is a marginal increase. Given the relatively minor increase in hard surfaces and design plans to dispose of most of the runoff on-site, a hydrologic analysis of the proposed action was not warranted.

Erosion Controls and Best Management Practices

All construction projects, including this one, are built from drawings that contain specifications, procedures, and measures to be followed by the contractor. The following specifications and notes are pertinent to your concerns:

Construction Notes:

- No contractor shall perform any construction operation so as to cause falling rocks, soil or debris in any form to fall, slide or flow into existing city drainage systems, or adjoining properties, streets or natural watercourses. Should such violations occur, the contractor may be cited and the contractor shall immediately make all remedial actions necessary.
- The contractor shall be responsible for conformance with the applicable provisions of the water quality and water pollution control standards contained in Hawaii Administrative Rules, Chapter 11-54, "Water Quality Standards" and Chapter 11-55, "Water Pollution Control", as well as Chapter 14 of the Revised Ordinances of Honolulu, as Amended. Best Management Practices shall be employed at all times during construction.

Temporary Erosion Control Measures:

- Temporary erosion control measures shall be submitted by the contractor for approval by the engineer prior to start of construction.
- Sedimentation basins, filter inlets, cut-off swales and diversion dikes shall be provided as necessary.
- Areas to be cleared, grubbed, and exposed at one time shall be kept to the smallest area possible.
- Temporary ground cover shall be planted or a sill tackifier spread over exposed areas not being worked on.
- Temporary erosion controls should not be removed before permanent erosion controls are in place and established.

- All measures to control erosion (including silt fences) and other pollutants shall be in place before any safety moving operations are initiated.

Cutural Siginificance

The Kawai Nui Marsh is an area of cultural significance to the Hawaiian people. The specific project area, however, is an extensively altered parcel on the margin of the marsh. During field inspection, no surface historic or archaeological sites associated with traditional Hawaiian occupation were observed in any portion of the project area. Subsurface investigations identified thick (1.5m) landfill associated with the post-1940 construction of the Kawai Nui drainage system. The fill covers the project area which virtually eliminates the possibility of any remaining cultural site. If there were traditional practices on the parcel, it is unlikely that artifacts would have survived the extensive reworking of the area that occurred during engineering projects for Kawai Nui Marsh and the adjacent Oneawa Drainage Canal.

Documentary research indicates that the project area was not used in any notable manner. Long-time residents who participated in the community-based vision process did not recall significant historic practices on or uses of the area, nor did they raise objections to the proposed improvements. Nonetheless, the proposed improvements would help facilitate access to the marsh and provide opportunities for native Hawaiians to engage in cultural practices. Indeed, the many people who are currently using the park facilities, especially children, youth, and families, are creating a new set of traditions and memories associated with the site, whether through formal, programmed activities (the athletic games) or through informal appreciation of a newly created passive park.

Thank you for your comments. The Final EA will be printed on both sides to save paper. I appreciate this opportunity to clarify the descriptions and analyses contained in the Draft Environmental Assessment.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU HI 96813

JEREMY HARRIS
Mayor

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

BARRY FUKUNAGA
Deputy Director

IN REPLY, REFER TO:
EST 00-032

September 26, 2000

TO: RANDALL K. FUJIKI, AIA, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: KENNETH E. SPRAGUE, P.E., PH.D.
DEPARTMENT OF ENVIRONMENTAL SERVICES

SUBJECT: CHAPTER 343, ENVIRONMENTAL ASSESSMENT SPECIAL MANAGEMENT AREA USE PERMIT (SMP); 2000/SMA-56 (lml)

Thank you for the opportunity to review and comment on the draft Environmental Assessment for improvements to the existing Kawai Nui Community Park.

Our database (current to 1993) shows no sewer lines in the park. Unless your Wastewater Branch's review shows new sewer lines in that area, the proposed action will not have an impact on our facilities or services. Therefore, our Department has no comments on this report.

Should you have any questions, please call Jack Pobuk, Program Coordinator at 527-6696.

KES nt

Post it® Fax Note 7671	Date 9/26/00	# of pages ▶ 1
To Glenn Kimura	From Jerry Lum	
Co./Dept.	Co. DEP	
Phone #	Phone # 527-6274	
Fax # 541-8557	Fax #	

KIMURA INTERNATIONAL

Monday, October 02, 2000

Mr. Kenneth Sprague, P.E., Ph.D.
Director
Department of Environmental Services
City and County of Honolulu
650 South King Street
Honolulu, Hi 96822

Dear Dr. Sprague:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 26, 2000 regarding the above-mentioned project, which indicated that because there are no sewer lines in the park, the proposed action will not have an impact on your facilities or services.

Thank you for your input.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-5845 • Fax (808) 941-8999

2000/CLOG-5175

KAILUA NEIGHBORHOOD BOARD NO. 31

P.O. BOX 687 • KAILUA, HAWAII 96734

00 SEP 21 AM 9 43

September 18, 2000

Randall K. Fujiki, AIA
Director of Planning and Permitting
City & County of Honolulu
650 South King Street
Honolulu, HI 96813

RE: City & County DPP letter dated September 13, 2000
Subject: Kawainui Community Park Improvements,
Draft Environmental Assessment
(Office Symbol: 2000/SMA-56(JJ))

Your letter asks for review and comment on the Environmental Assessment for Kawainui Community Park. Deadline for comments in the body of the letter is October 13, however, bottom line instruction states "REPLY DUE TO DPP, September 25, 2000." On September 15, Mr. Jeff Lee agreed with Jim Corcoran, Chair, Environmental Committee, Kailua Neighborhood Board No. 31 that the suspense date is, in fact, October 13, 2000.

Review of the Draft EA dated August, 2000 shows that one among other agencies consulted for this DEA was the Kailua Neighborhood Board No. 31 (See page I-1, paragraph I. F.). The EA further states that the design of the proposed project has evolved "through the planning and design process and community input from [interalia] the Neighborhood Board" (See page IV-5, paragraph IV. V (3)). This information is factually incorrect. Extensive review of official Kailua Neighborhood Board meeting minutes reveal that this project was never a subject of consideration by the Kailua Neighborhood Board. Further the Kailua Neighborhood Board Chairperson, Ms. Faith Evans, states that this project was never brought before the Kailua Neighborhood Board and that the Board had no knowledge of, and never acted on, the Kawainui Community Park proposed project.

The Draft EA states "the proposed project, an initiative of the Vision 2000 program for the Kailua area, allocates public funds for the improvement of an existing public park that has been in existence since 1978." (see page IV-1, paragraph IV. A. 1. *(c) (1)*). Also, listed among Agencies Consulted is the "Kailua Vision Team" (See page I-1, paragraph I. F.). Additionally, the Draft EA states in the body that, "In January 2000 the initial design idea proposed by the Vision 2000 Team for improving the park" dealt with the parking lot covering material. This paragraph goes on to say that "subsequent meetings of the Vision Team revised the plan" for the parking lot topping (Emphasis added, see page IV-5, paragraph IV. B. (2)). The recommended course of action for this project states that the project "has the support of the Kailua community."

The "Vision Team 2000" role in pushing this project forward without input from the Kailua Neighborhood Board is cause of great concern. After the Mayor's appearance at the Kailua Neighborhood Board, August 3, 2000, Mr. Arakawa, the City Counselor, told the Kailua Neighborhood Board that "Vision Teams do not have supervisory control, jurisdiction or advisory power over specific matters" (See OLEO TV recording, Kailua Neighborhood Board No. 31, August 3, 2000). Yet here, this Draft EA states that this project was "proposed" by the Vision 2000 Team, that the Kawainui Community Park is an "initiative put forward by the Vision 2000 Team for Kailua" and that "subsequent meetings of the Vision Team revised the plan." All of that was done without the knowledge of, or input by the Kailua Neighborhood Board. The Vision Team 2000 actions on this project appear clearly to have constituted "supervision, control, jurisdiction or advisory power over specific matters" (HRS, Chapter 92 "Sunshine Law", paragraph 92-2(1)) as shown above.

Should not the Vision Team 2000 be brought under the provisions of the "Sunshine Law" in that it has performed actions as stipulated in that very law?

If "subsequent meetings of the Vision Team revised the plan," doesn't that, clearly, demonstrate that the Vision Team has "control," or, at least, "advisory power" over plans and expenditures of public

monies? This especially, in light of the fact that directions and guidance were purportedly given to the sub-contractor by an employee or employees of the City and County of Honolulu?

There is concern among members of the Kailua Neighborhood Board, as expressed at many monthly meetings and in various letters, that the Mayor's Vision Team is diluting the responsibility and capacity of the Kailua Neighborhood Board No. 31 to carry out its chartered role (under the City and County's Neighborhood Plan (R)) to develop and submit CIP projects to the City & County Government. In this case, the Vision Team launched, and revised, this project and brought it to the Draft Environmental Assessment level, with a Public Hearing scheduled for September 28, 2000, without knowledge or input from Kailua Neighborhood Board No. 31.

It is respectfully requested that the operating parameters and fiduciary jurisdiction of the Vision Team 2000 be examined to determine whether or not the Vision Team should, in accordance with existing statutes, be required to operate under the full requirements of the "Sunshine Law," or be discontinued permanently.

We ask for a timely response to the issues we raise in this letter in order to expedite Kailua Neighborhood Board No. 31 proceedings on community projects in the critical months ahead. The next meeting of the Kailua Neighborhood Board is October 5, 2000. Thank you, very much.

Sincerely,

Jim Corcoran
Chair, Environmental Committee
for Ms. Faith Evans,
Chair, Kailua Neighborhood Board No. 31

CC Mayor Jeremy Harris
Earl Anzi, Attorney General
Ms. Monya Gray, Director OIP
Representative David A. Penafleton
Representative Cynthia Thielen
Councilmember Steve Holmes
Councilmember John Henry Felix

KIMURA INTERNATIONAL

Tuesday, October 03, 2000

Mr. Jim Corcoran
Chair, Environmental Committee
for Ms. Faith Evans,
Chair, Kailua Neighborhood Board No. 31
P.O. Box 487
Kailua, HI 96784

Dear Mr. Corcoran:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 18, 2000 regarding the above-mentioned project.

The statements in the Draft EA referring to consultation or review by the Kailua Neighborhood Board No. 31 are incorrect. As subconsultants, we were hired to prepare the EA and were not with the project from its very beginning. We had assumed incorrectly that the neighborhood board was consulted and apologize for this error. The Final EA will correct any references on this matter.

Thank you for your comments.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1602 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-8848 • Fax (808) 941-8929

September 22, 2000 Submitted via Fax

City and County of Honolulu
Department of Design and Construction
Attention: Mr. Gary Q. L. Yee, AIA, Director
650 South King Street
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment - Kawai Nui Community Park Parking Lot and Landscape Improvements, August 2000

Dear Mr. Mau:

Kawai Nui Heritage Foundation appreciates the opportunity to comment on the subject document. Our comments on the subject document fall in two areas.

Incomplete waterbody name; incorrect statements regarding pattern of drainage

1. Throughout the document, the body of water immediately mauka of the subject parcel is referred to as "Kaelepulu Channel." The correct name is "Kaelepulu Channel Extension" to differentiate it from drainages from Kaelepulu Pond (Enchanted Lake).
2. The body of water at the Mokapu Saddle Road end of the subject parcel is variously named "Kawai Nui Canal" (Figure ES-1) and "Oneawa Channel" (various places in the text); both names have been used for that body of water over the years. Whichever name is used, we believe that the assertion (Executive Summary, p. III-5, and perhaps elsewhere in the document) that Kaelepulu Channel Extension drains into Kawai Nui Canal/Oneawa Channel is not correct.

We are aware that the March 1977 document "Kawainui Marsh Environmental Restoration Project,...Assessment" listed as a reference in the subject dEA (and earlier documents) indicated that a weir making that connection was to be constructed. However, it was not constructed when the dike was built. Unless it was added during the raising and reinforcing of the dike in the mid-1990s (and we are not aware it was), there is not and never has been a connection

between Kaelepulu Channel Extension and Kawai Nui Canal/Oneawa Channel. We urge that contact be made with the Honolulu Engineer District, U. S. Army Corps of Engineers to ascertain the correct facts in this matter.

Potential runoff erosion problem

Figure ES-1 shows a 6' wide ADA accessible concrete sidewalk running between the parking lot and the play fields. On Page III-6 (continuation of Section E.) of the subject document the statement is made "After implementation, runoff from the parking lot will be directed to the play fields to the south where it will filter through the play field lawns."

We have two concerns with this scenario. One is that if the parking lot is sloped to send runoff toward the play fields, it will hit the sidewalk and end up running back down Kaha Street. Secondly, given the fact that much of Kailua's rain comes in short, hard squalls, runoff from the parking lot, if it can get to the play fields over the sidewalk, will erode into the play field along the fence line.

We suggest that a single-block width of "Grasscrete" or other polygeogrid product filled with soil and planted with low-maintenance groundcover be embedded along both sides of the sidewalk to slow runoff flow.

Mahalo again for the opportunity to comment, If we can provide any more information, please do not hesitate to contact me at 261-7580.

Me ke aloha pumehana,

Susan Elliott Miller

Susan Elliott Miller, President

cc: Approving Agency/Accepting Authority -
City and County of Honolulu, Department of Planning and Permitting
Agent - Kimura International, Inc.
Office of Environmental Quality Control

Na Kia'i Pono 'O Kawai Nui
KAWAI NUI HERITAGE FOUNDATION
P.O. BOX 1101 KAILUA, HAWAI'I 96734

KIMURA INTERNATIONAL

Monday, October 02, 2000

Ms. Susan Elliott Miller, President
Kawai Nui Heritage Foundation
P.O. Box 1101
Kailua, HI 96734

Dear Ms. Miller:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 22, 2000 regarding the above-mentioned project.

1. **Kaelepulu Channel Extension**
Thank you for clarifying the name and drainage pattern of this channel. It will be called "Kaelepulu Channel Extension" throughout the final Environmental Assessment (EA). A site visit verified that this channel does not connect to the Kawai Nui Canal/Oneawa Channel. We also caused undue confusion by using two different names -- the Kawai Nui Canal and Oneawa Channel – to describe the same waterway. The confusion stems from various documents that use the U.S.G.S. map as the base map. The U.S.G.S. map identifies the waterway as the Kawainui Canal. But on more recent documents, i.e., the Kawai Nui Marsh Master Plan, 1994, the waterway is named the Oneawa Channel. For the sake of simplicity, we will consistently identify this body of water as the Oneawa Channel, which appears to be the correct name, in the Final EA.

2. **Potential Runoff Erosion Problem**
The use of rainfall runoff was given much thought in the design of the parking lot. The intent is not to waste rainwater that could wisely be used to irrigate the landscaping on site and to avoid continued use of potable water for irrigation. Since the publication of the Draft EA, the parking lot drainage plan has been modified again. Now, half of the lot will drain toward the tree planters located in the middle of the parking lot and the other half will drain toward the playfields. The sidewalks on the playfield side of the parking lot have two open drain culverts topped with a steel plate that will allow runoff to flow into the playfields instead of back out to Kaha Street. Your concern over possible erosion on the playfield is well taken. If erosion becomes a problem at the points of discharge, some type of "grasscrete" or polygeogrid product may be warranted.

Thank you for your comments. I appreciate this opportunity to clarify the statements contained in the Draft Environmental Assessment.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-5545 • Fax (808) 941-5999

SEP-26-00 TUE 8:41 PLANNING & PERMITTING FAX NO. 8085276743 P.02

BOARD OF WATER SUPPLY

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

'00 SEP 25 AM 10 11

CITY & COUNTY HONOLULU

September 19, 2000

JEREMY HARRIS, Mayor

EDDIE FLORES, JR., Chairman
CHARLES A. STED, Vice-Chairman
JAN M. L. Y. AMI
HERBERT S. K. KAOPUA, SR.
BARBARA JOAN STANTON

KAZU HAYASHIDA, Ex-Officio
ROSS S. SASAMURA, Ex-Officio

CLIFFORD S. JAMILE
Manager and Chief Engineer

TO: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: FOR CLIFFORD S. JAMILE

SUBJECT: YOUR TRANSMITTAL OF AUGUST 23, 2000 REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KAWAI NUI COMMUNITY PARK PARKING AND LANDSCAPE IMPROVEMENTS, KAILUA, OAHU, TMK: 4-2-16: PORTION 1 AND 8

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the proposed Kawai Nui Park improvements.

We have the following comments:

1. There is one existing 1-inch water meter (Prem ID Number: 1055086) serving TMK: 4-2-16: 08. There are two existing 2-inch meters (Prem ID Number: 1112762 and 1112763) and one inactive service (Prem ID Number: 1070320) serving TMK: 4-2-16: 01.

2. 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.

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

4. The proposed project is subject to Board of Water Supply cross-connection control requirements prior to the issuance of the building permit application.

If you have any questions, please contact Kathryn Kami at 527-5221.

Pure Water ... our greatest need ... we protect wisely

KIMURA INTERNATIONAL

Monday, October 02, 2000

Mr. Clifford S. Jamile
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96843

Dear Mr. Jamile:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 19, 2000 regarding the above-mentioned project. We will forward your letter to the civil engineer in charge of the project to ensure that the BWS's requirements are met during the building permit process.

Thank you for your input.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-5548 • Fax (808) 941-5599

September 16, 2000

Mr. Henry Mau
Department of Design and Construction
City and County of Honolulu
650 S. King St.
Honolulu, HI 96813

RECEIVED
'00 SEP 19 P2:06
FACILITIES DESIGN & ENG.
DEPT. OF DESIGN & CONST
C & C OF HONOLULU

Dear Mr. Mau,

Subj: Planned Improvements to Kaha Park, Kailua

This letter is to provide inputs to the planned improvements to Kaha Park. The Windward Soccer Club is a community-based soccer club serving youth on the Windward side of Oahu. Our teams use Kaha Park to play soccer games as part of the Hawaii Youth Soccer Association (HYSA), which is the accredited state organization for the US Youth Soccer Federation (USYSF).

We welcome the City's efforts to improve the facilities and amenities in the park, including landscaping. However, we request that the landscaping be restricted to areas along the park perimeter so as not to interfere with the soccer fields. Trees with large canopies should not be planted since they will eventually encroach on the field. This has happened at the Kailua Recreation Center where monkeypod trees now reach over into the field, affecting balls in the air.

We are available to consult on the proposed improvement plans. You can either reach me at 474-4889, or Greg Culver at 261-7517. Greg is a professional landscaper, and would be familiar with plant growth and the appropriate selection.

Thank you for the opportunity to comment on this very important project to the Kailua and youth soccer communities.

Sincerely,

Byrnes Yamashita
President
Windward Soccer Club
966 Kina St.
Kailua, HI 96734
Phone: 261-8542

cc:
Mr. Greg Culver
Mr. John Hingham

Tel con –
9/22
re Greg Culver
only concern is
trees not inside
play field.

KIMURA INTERNATIONAL

Monday, October 02, 2000

Mr. Byrnes Yamashita, President
Windward Soccer Club
966 Kina Street
Kailua, HI 96734

Dear Mr. Yamashita:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 16, 2000 regarding the above-mentioned project. We note that your letter welcomes the City's efforts to improve the park.

We acknowledge your request that large canopy trees be restricted to the park perimeter to avoid having them interfere with the flight of soccer balls within the playfield boundaries. As a point of clarification, this project does not involve the existing playfields. The proposed parking lot begins where the existing used concrete piles have been placed and extends in a northerly direction to include the triangular area that is now undeveloped. The undeveloped triangular area will be developed as a passive park with a mixture of large and medium canopy trees, a central lawn area, and interpretive plantings, i.e., native Hawaiian species, along the borders.

As designed by the project's landscape architect, Mike Miyabara, FASLA, the only area where future trees may impact soccer play would be immediately adjacent to the parking lot where two medium canopy trees, either Milo or Kou, are proposed. These species of trees typically have a canopy of 30 feet when fully mature.

While our plans show a Monkeypod tree on the southwestern corner of the proposed parking lot, this planting is part of another project. I believe Mr. Steve Mechler is the consultant for the playfield area of the park and he would be the best person to contact regarding your concern.

Thank you for your input.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-5548 • Fax (808) 941-5929

SEP-18-00 MON 11:10 PLANNING & PERMITTING FAX NO. 8085276743 P.02

'00 SEP 18 AM 9 59

CITY & COUNTY

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

September 13, 2000

LD-NAV

Ref.: 2000/SMA56.RCH

Honorable Randall K. Fujiki, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Fujiki:

SUBJECT: I.D.: 2000/SMA-56 Special Management (SMA) Area Use Permit Kawai Nui Community Park Improvements
Applicant: City and County of Honolulu Department of Design and Construction, Oahu, Hawaii

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

A copy of the SMA application titled "Kawai Nui Community Park" was transmitted to our appropriate divisions for their review and comment.

Attached herewith is a copy of our Division of Forestry and Wildlife comment.

The Department has no other comment to offer on the subject matter at this time.

Should you have any questions, please feel free to contact Nicholas Vaccaro of the Land Division's Support Services Branch at 808-587-0438.

Very truly yours,

DEAN Y. UCHIDA
Administrator

C: Oahu District Land Office

KIMURA INTERNATIONAL

Monday, October 02, 2000

Mr. Dean Uchida
Administrator
State of Hawaii
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, HI 96809

Dear Mr. Uchida:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 13, 2000 regarding the above-mentioned project, which included a copy of comments made by your Division of Forestry and Wildlife. We note that your Department had no other comments.

Thank you for your input.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-8545 • Fax (808) 941-8999

Glenn Kimura

From: Libby Ellett Tomar [tomar3@gte.net]
Sent: Friday, September 08, 2000 11:12 AM
To: Glenn Kimura
Cc: Paula Loomis; Carol Ann Ellett; Cindy Turner; Larry
Subject: Fw: Kaha Park, Kailua Hawaii Parking Lot

Hi Glenn and Vision Team Members: Here's Harrison Rue's comments to my suggestion that the middle of the parking lot have a pathway between the soccer field and passive park. I strongly support this addition to the design and ask that you put it in. I ran into Harrison last night (he was on his way to the Kailua Neighborhood Board meeting) and when I mentioned to him that 4 parking stalls would have to be eliminated, he quickly commented that "This park should primarily be for pedestrians". I'm not sure what the current number of stalls are, but if we lose 4, I'm sure the effect will be negligible. I much prefer the message that adding the speed table would bring - that is, that we care and respect and encourage people to walk across between the two areas, and that we recognized that human nature being what it is, people will want to take the shortest path across and not cut over to the two ends to get across. Harrison is a recognized expert in the field of urban planning and creating pedestrian friendly spaces. He is a consultant to the City's DTS traffic calming program. He has recently published a book on how to make city streets designed better. Aloha, Libby

----Original Message----
From: Harrison Bright Rue <hbrue@citizenplanner.com>
To: Libby Ellett Tomar <tomar3@gte.net>
Cc: Glenn Kimura <gkimura@kimurainternational.com>
Date: Thursday, September 07, 2000 5:05 PM
Subject: RE: Kaha Park, Kailua Hawaii Parking Lot

Great idea, Libby, as described. You're thinking of a 'flat-topped speed table, which 1) keeps people from speeding through the lot; 2) is much less objectionable to drivers than a speed bump; and 3) clearly marks the ped crossing – better than paint. We've drawn them into several of the TC plans (at residents' request). You can see them in parking lots around the island – though most of the don't meet our current recommendations (but still much better than humps). The flat top should be at least 10' wide, with a 4' or so tapered approach at each side, giving a fairly shallow approach. They have one at a shopping center in Kaneohe (the Starbucks one near Castle, but around back to right of Starbucks). I've seen one at Kahala Mall, upstairs, and there are some steep ones in the parking lot behind Blaisdell – and a very wide one (for buses) in the pull-in in front of Blaisdell and another wide one at the ped crossing for the bus parking at top of Punchbowl.

None of our new designs are built here yet.

HBR

-----Original Message-----
From: Libby Ellett Tomar [mailto:tomar3@gte.net]
Sent: Thursday, September 07, 2000 11:08 PM
To: Harrison Rue
Cc: Glenn Kimura
Subject: Kaha Park, Kailua Hawaii Parking Lot

Hi Harrison: The Kailua Vision team has funded upgrading the Kaha Park in Kailua, which is located in Coconut Grove. I've looked at the plans and there is a 40 car parking lot. The lot sits between a double soccer field and a passive park. At one end of the park, adjacent to the marsh, there will be a concrete sidewalk, which will connect to the dike road. At the opposite end, which is the opening to the marsh, there is a lined pathway on the parking lot (I think - Glenn, please confirm for me). I suggested that the design also paint a pedestrian pathway in the middle of the parking lot, which would connect the soccer field to the passive park and provide a "safe zone" or "safer zone" for those who are walking between the two and don't want to walk down to the edges to get across. What do you think? Is there any research which suggests that incorporating that type of design element into parking lots promotes safety and accessibility? I believe that 4 parking spaces would have to be given up if this were to be designed in. I thought if a "street table" could be built to connect the two sides, that would be even better. Glenn wasn't sure what that was -do you know if the City has installed any of these yet in their traffic calming projects

10/2/2000

KIMURA INTERNATIONAL

Monday, October 02, 2000

Ms. Libby Ellett Tomar
779 Kahoa Dr.
Kailua, Hawaii 96734

Dear Ms. Tomar:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for the various e-mail messages regarding the above-cited project. Your suggestion to include a "Flat Topped Speed Table" in the center of the parking lot was referred to the prime consultant and Kailua Vision Team committee. These traffic-slowing devices are commonly found at shopping centers or other areas where large numbers of people converge at a central destination. A 10 foot wide speed table with 4' tapered approaches would cost approximately $40,000, would eliminate 8 stalls (because of the recommended tapered approaches), and would require revising the drainage plan again to avoid having the speed table act as a dam. Although the merits of your suggestion were well taken, it was decided that the speed table could be added at a later date.

Thank you for your input.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Man
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-5845 • Fax (808) 741-8021

BENJAMIN J. CAYETANO
GOVERNOR

GENEVIEVE SALMONSON
DIRECTOR

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

September 1, 2000

Gary Yee, Director
Department of Design & Construction
650 South King Street
Honolulu, Hawaii 96813

Attention: Howard Mau

Dear Mr. Yee:

Subject: Draft Environmental Assessment (EA) for Kawai Nui Parking Lot & Landscape Improvements

We have the following comments to offer:

Two-sided pages: In order to reduce bulk and save on paper, please consider printing on both sides of the pages in the final document.

Contacts: In the final EA enclose copies of all correspondence from the pre-consultation phase of this project, as well as from the draft EA review period. Has the State Historic Preservation Division of DLNR concurred with the findings of the report submitted by Cultural Surveys HI? If so document this in the final EA.

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

Sincerely,

GENEVIEVE SALMONSON
Director

c: Glenn Kimura

KIMURA INTERNATIONAL

Monday, October 02, 2000

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

Dear Ms. Salmonson:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 1, 2000 regarding the above-mentioned project. The final document will be printed on both sides to save paper. Copies of correspondence received in the draft EA review period and other written pre-consultation correspondence will be included in the final EA. The archaeological report has been transmitted to the State Historic Preservation Division of DLNR for their review. Their response will be included in the Final EA.

Thank you for your comments.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-8545 • Fax (808) 941-8999

Division of Forestry & Wildlife

1151 Punchbowl Street, Rm. 325 • Honolulu, HI 96813 • (808) 587-0166 • Fax: (808) 587-0160

September 1, 2000

MEMORANDUM

TO: Nick Vaccaro, Land Agent
Land Division

THRU: Dean Uchida, Administrator
Land Division

FROM: Michael G. Buck, Administrator
Division of Forestry and Wildlife

SUBJECT: Special Management Area Use Permit Kawai Nui Community Park-Applicant: City and County of Honolulu, Department of Design and Construction - I.D. 2000-SMA-56, Oahu.

We have reviewed the above referenced document. The proposed project to replace a temporary gravel-based parking lot with a permanent 40-stall asphalt concrete parking lot without parking lights will not affect any of DOFAW's programs and therefore, we do not have any objections to this application. Thank you for the opportunity to comment.

C: Oahu DOFAW Branch

KIMURA INTERNATIONAL

Monday, October 02, 2000

Mr. Michael G. Buck
Administrator
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, HI 96813

Dear Mr. Buck:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated September 1, 2000 regarding the above-mentioned project, which indicated that the proposed project will not affect any of DOFAW's programs.

Thank you for your comments.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-8585 • Fax (808) 941-2793

SEP- 5-00 TUE 8:16 PLANNING & PERMITTING FAX NO. 6085276743 P.01

BENJAMIN J. CAYETANO
GOVERNOR

'00 SEP 1 PM 3 49

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

August 29, 2000

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

IN REPLY REFER TO
STP 8.9665

Mr. Randall K. Fujiki, AIA
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Fujiki:

Subject: Kawai Nui Community Park Improvements
Chapter 343, Draft Environmental Assessment (DEA) and
Special Management Area Use Permit (SMP)
TMK: 4-2-16: Por. 1 and Por. 8

Thank you for your transmittal requesting our review of the subject project.

The subject project will not impact our State transportation facilities.

We appreciate the opportunity to provide comments.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

Post-it® Fax Note 7671	Date 9/5/00	# of pages ▶ 1
To Glenn Kimura	From Jesse Lee	
Co./Dept.	Co. DOT.	
Phone #	Phone # 527-6274	
Fax # 941-8995	Fax #	

KIMURA INTERNATIONAL

Monday, October 02, 2000

Mr. Kazu Hayashida
Director of Transportation
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Hayashida:

Draft Environmental Assessment
Kawai Nui Community Park
Parking Lot and Landscape Improvements

Thank you for your letter dated August 29, 2000 regarding the above-mentioned project, which indicated that the subject project will not have an impact on State transportation facilities.

Sincerely,

Glenn T. Kimura

cc: Department of Planning and Permitting, Mr. Randall Fujiki
Department of Design and Construction, Mr. Harold Mau
OEQC

1600 Kapiolani Blvd., Suite 1610
Honolulu, Hawaii 96814
Tel (808) 944-5548 • Fax (808) 941-5999

IX. References

"Final Environmental Assessment, Management Plan for Kawai Nui Marsh." Department of Land and Natural Resources, Land Division, March 2000.

"Kawainui Marsh Environmental Restoration Project, Draft Project Modification Report and Environmental Assessment", Department of Land and Natural Resources, Division of Forestry and Wildlife and U.S. Army Corps of Engineers, Pacific Division, March 1977.

"Kawai Nui Marsh Master Plan, Oahu, Hawaii Report R-100", State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife and Division of Water and Land Development, July 1994

"Kailua Quadrangle, 7.5 Minute Series (Topographic Map)." U.S. Department of Interior Geological Survey, 1983.

"Flood Insurance Rate Map, Panel 0060B" Federal Emergency Management Agency, 1995.

"Conservation District Use Application for Public Recreational Use at Kailua, Oahu", File No.: OA-2/28/78-1036, August 1978.

"Conservation District Use Application for Subdivision", File No.: OA-11/5/93-2679, April 1994.

APPENDICES

Botanical Resources Assessment
Char & Associates

Wildlife Survey
Tim J. Ohashi
Certified Wildlife Biologist

Archaeological Inventory Survey
Cultural Surveys Hawaii

Geotechnical Consultation
Pacific Geotechnical Engineers, Inc.

CHAR & ASSOCIATES
Botanical/Environmental Consultants
4471 Puu Panini Ave.
Honolulu, Hawaii 96816
(808) 734-7828

28 July 2000

Kimura International, Inc.
1600 Kapiolani Boulevard, Suite 1610
Honolulu, Hawaii 96814

Attention: Glenn T. Kimura

SUBJECT Kawainui Community Park
Botanical Resources Assessment

Dear Mr. Kimura:

An assessment of the botanical resources was made for the Kawainui Community Park areas planned for improvements. The improvements include a new asphalt concrete parking lot, concrete sidewalk and picnic table concrete slabs, and removal and regrassing of an existing gravel road.

The field study was conducted on 26 July 2000. The primary objectives of the survey were to:

1) provide a general description of the vegetation on the areas planned for the improvements;
2) search for threatened and endangered species as well as species of concern; and
3) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

The plant names used in the discussion follow Wagner et al. (1990). More recent name changes are in accordance with Evenhuis and Miller (1995-1998) and Evenhuis and Eldredge (1999).

Description of the Vegetation

To the south of the existing crushed coral and gravel-lined parking lot is a maintained, grassy area which supports a ball field. The vegetation here is mowed lawn composed primarily of Bermuda grass or manienie (Cynodon dactylon) with a few patches

of wiregrass (Eleusine indica), creeping indigo (Indigofera hendecaphylla), and Heliotropium procumbens var. depressum.

The existing parking lot supports low mats of Bermuda grass, khaki weed (Alternanthera pungens), creeping indigo, Brachiaria subquadriparia, Guinea grass (Panicum maximum), and puahilahila or sensitive plant (Mimosa pudica var. unijuga). Low patches of wedelia (Spagneticola trilobata) are common along the canal-side of the parking lot. Plant cover is about 40%.

To the north of the existing parking lot is an unmaintained, overgrown, weedy area with an existing gravel road. A layer of mulch has been spread on some parts of this site. The new sidewalk and picnic slabs are planned for this area. Vegetation cover is about 60% with patches of white-flowered Spanish needle (Bidens alba var. radiata), swollen fingergrass (Chloris barbata), pink bindweed vine (Ipomoea triloba), and khaki weed abundant. Other weedy species occurring here occasionally include creeping indigo, false mallow (Malvastrum coromandelianum), hairy spurge (Chamaesyce hirta), graceful spurge (Chamaesyce hypericifolia), prickly sida (Sida spinosa), Heliotropium, Johnson grass (Sorghum halpense), and Boerhavia coccinea. A few young monkeypod saplings (Samanea saman) and koa haole shrubs (Leucaena leucocephala), 2 to 3 feet tall, are also found in this area.

Where the unmaintained area abuts several homes and a chain link fence, there are plantings of coconut (Cocos nucifera) and other palms. Scarlet fruited gourd or coccinia (Coccinia grandis) vines are locally abundant along the fence line.

Discussion

The project site is dominated by introduced, mostly weedy spceies. Introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's discovery of the islands in 1778. This is not surprising as the site has been disturbed and in use for a long time. The only native plant observed was 'uhaloa (Waltheria indica). The 'uhaloa is indigenous, that is, it is native to Hawai'i and elsewhere.

None of the plants found on the site is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999). No wetlands or wetland vegetation (Reed 1988) occur on the site proposed for improvements.

Given the findings above, the proposed improvements to the site

are not expected to have a significant negative impact on the botanical resources. All of the plants can be found in similar disturbed, lowland habitats throughout the Hawaiian Islands. There are no botanical reasons to impose any restrictions, conditions, or impediments to the proposed plans.

Please do not hesitate to contact me should you have any questions regarding this letter report.

Sincerely,

Winona P. Char

Winona P. Char

References

Evenhuis, N.L. and S.E. Miller, editors. 1995-1998. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 41-56.

Evenhuis, N.L. and L.G. Eldredge, editors. 1999. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 58-59.

Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: Hawaii (Region H). U.S. Fish and Wildlife Service Biological Report 88(26.13).

U.S. Fish and Wildlife Service. 1999. U.S. Fish and Wildlife Service species list, plants. March 23, 1999. Pacific Islands Ecoregion Office, Honolulu, HI.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. Bishop Museum Special Publication 83.

Wildlife Survey
Kawainui Marsh Parking Lot
Kailua, Oahu, Hawaii

Prepared for:
Kimura International, Inc.
1600 Kapiolani Blvd., Ste. 1610
Honolulu, Hawaii 96814

Prepared by:
Tim J. Ohashi
Certified Wildlife Biologist
P.O. Box 786
Volcano, Hawaii 96785

June 11, 2000

1.0 Introduction

A field survey was conducted on May 13, 2000 to assess the wildlife resources found on and adjacent to a 18,000 square foot area proposed for a 49 stall parking lot located next to residences, a soccer field and Kawainui Marsh in Kailua, Oahu, Hawaii. The objectives of the survey were to provide a record of wildlife on the site and determine whether the project would adversely impact any important wildlife resources in the area.

2.0 Site and Habitat Description

The site of the proposed parking lot improvements already functions as an unpaved parking area when the soccer field is in use. The field and lot are between a residential subdivision and a canal along the Kawainui Marsh dike. No native terrestrial plants were in the area. Bermuda grass, wedelia and wayside weeds occurred on the field, the unpaved parking lot and adjacent vacant lot behind some townhouses.

3.0 Method

A site visit was made and an eight minute observation period was conducted to formalize the visit. All birds seen and heard were recorded. No birds were actually on the parking lot site. Most occurred on the soccer field and the adjacent vacant lot.

4.0 Results

Common mynas, zebra doves, spotted doves and the federally listed black-necked stilt were seen foraging in the soccer field. Three stilts were present during the site visit. On the adjacent vacant lot, a flock of about 30 red avadavats was foraging in grass seeds. Within the canal, there was a pair of feral mallards with one downy chick and a mallard hybrid hen with a brood of four ducklings. No endangered koloa or coots were found, although they are in the area. Because it was spring, no Pacific golden plovers were seen on the field, although they are expected to be present during the fall and winter months. The following is a list of birds observed during the site visit.

Java sparrow (*Padda oryzivora*)
Red avadavat (*Amandava amandava*)
Spotted dove (*Streptopelia chinensis*)
Common myna (*Acridotheres tristis*)
Zebra dove (*Geopelia striata*)
House finch (*Carpodacus mexicanus*)
English sparrow (*Passer domesticus*)
Red crested cardinal (*Paroaria coronata*)
Mallard (*Anas platyrhynchos*)

Black necked stilt (*Himantopus himantopus knudseni*) - The stilt is a federally listed endangered species. Stilts use a variety of aquatic habitats including fresh, brackish and salt water areas. Stilts are opportunistic feeders. Upland sites near stilt aquatic habitats may be used by stilts during periods of rainfall or during irrigation. It is not unusual to see stilts on lawns and playgrounds within the Kailua wetland complex which includes Nuupia Ponds, Kawainui Marsh, Kaelepulu Pond and associated canals and waterways.

5.0 Conclusion and Summary

The parking lot improvement project is proposed on a site that is already being used as a parking lot. Endangered stilts use the adjacent field but they appeared to be habituated to human activity and will likely continue to use the field if the project is approved. Since the project does not entail modifications to the canal, no affects are expected to the waterfowl using the canal except the usual human disturbance they are probably accustomed to in such an urban area.

6.0 Bibliography

Hawaii Audubon Society. 1989. Hawaii's birds. Honolulu, HI.

U.S. Fish and Wildlife Service. 1999. Draft Revised Recovery Plan for Hawaian Waterbirds Second Revision. Portland, Oregon.

Pacific Geotechnical Engineers, Inc.

Soils and Foundations
& Engineering Geology

429-B Waiakamilo Road
Honolulu, Hawaii 96817
Telephone (808) 841-8024
Facsimile (808) 848-5102
Email: pge@pacificgeotechnical.com

June 6, 2000
3771-043

Hawaii Pacific Engineers, Inc.
1132 Bishop Street, Suite 1003
Honolulu, Hawaii 96813

Attention: Mr. Lester Fukuda

Subject: Consultation Letter
Geotechnical Consultation
Proposed Parking Lot
Kawainui Community Park
Kailua, Oahu, Hawaii, For The
Department of Design and Construction

Gentlemen:

1.0 INTRODUCTION

This consultation letter summarizes our findings and recommendations for the proposed parking lot to be constructed at the City's Kawainui Community Park on Oahu. Our services were performed in general accordance with our October 14, 1999 proposal.

The approximate location of the site is shown on the Map of Area, Plate 1.

2.0 PROJECT CONSIDERATIONS

We understand that the proposed park improvements consist of the construction of a new paved parking lot for 43 cars. The site is bordered by Kaelepulu Channel and dikes on the west, Kaha Street and residences on the east, and open fields on the north and south. According to the project site plan, the new parking lot will be located just off of Kaha Street. The proposed park improvements are shown on the Plot Plan, Plate 2.

According to a preliminary grading plan for this project, approximately 0.5 to 1.5 feet of new fill is planned at the parking lot.

We understand that traffic in the park will generally consist of passenger vehicles, vans, and trucks. We further understand that the pavement may also be subjected to periodic construction equipment traffic such as a front end loader for dike maintenance in the park.

3.0 SCOPE OF SERVICES

Based on the above considerations, the following scope of services was performed:

1. *Field Exploration* - Subsurface conditions at the proposed improvement areas were explored by drilling three (3) soil test borings, each to a depth of approximately 10.5 feet below existing grades. After the completion of our field work, the layout of the parking lot was adjusted slightly further to the north.

   The approximate locations of our borings are shown on the Plot Plan, Plate 2. The locations and elevations of the borings were estimated based on information provided on the project topographic plans and our field engineer's measurements using a tape.

   The borings were drilled with a truck mounted drill rig using continuous flight augers. Prior to the start of our field exploration, various utility companies were contacted to check the proposed boring locations for possible underground utilities. Each boring location was also toned using a metal detector prior to drilling. The drilling was performed under the technical observation of our engineer who maintained a log of the soils encountered, and obtained relatively undisturbed and disturbed soil samples for further examination and laboratory testing.

   After the completion of drilling, the holes were backfilled with soil cuttings to existing grades.

   The log of our borings are presented on Plates 3.1 through 3.3. The soils encountered in the borings were initially classified according to American Society of Testing and Materials (ASTM) D2488 procedures and the Unified Soil Classification System presented on Plates 4.1 and 4.2. The field classifications were later refined based on the results of laboratory tests performed on selected soil samples in general accordance with ASTM D2487.

2. *Laboratory Testing* - After the completion of our field work, the soil samples obtained from our borings were transported to our laboratory for further examination and testing. The testing included moisture content and dry density determinations, Atterberg Limits tests, gradation tests, a moisture-density relations test, and a California Bearing Ratio (CBR) test.

   The results of the moisture content and dry density determinations are presented on the Log of Borings, Plates 3.1 through 3.3, at the respective sample depths. The Atterberg Limits test results are presented on Plate 5. The gradation test

results are presented on Plate 6. The moisture-density relations and CBR test results are presented on Plates 7 and 8, respectively.

3. *Engineering Analysis and Consultation Letter* - Based on the results of our field exploration and laboratory testing, engineering analyzes were performed and comments and recommendations developed regarding site preparation and grading, and flexible pavements design. The results of this consultation, including our field and laboratory test results, are summarized in this letter.

4.0 SITE CONDITIONS

4.1 SURFACE CONDITIONS

According to the concept site plan dated January 12, 2000, the site is relatively level with the ground surface sloping gently from the north to the south. Surface elevations across the proposed parking lot range from +5 to +6 feet. All elevations in this consultation letter are referenced to Mean Sea Level datum.

Surface soils generally consist of light brown silty coralline sand. The ground surface is sparsely vegetated with grass.

4.2 SUBSURFACE CONDITIONS

Subsurface conditions encountered at the site are illustrated on the Log of Borings Presented on Plates 3.1 through 3.3. Because the borings are widely spaced, subsurface and groundwater conditions between our borings will vary locally.

Subsurface conditions encountered in our borings generally consisted of fill material on the surface to a depth of approximately 5 feet. The fill consisted of 1 to 3 feet of loose to dense silty coralline sand underlain by very stiff silt and clay and loose to medium dense clayey coralline sand and gravel. The fill was underlain by lagoonal deposit consisting of very loose to medium dense silty coralline sand and gravel to the bottom of our borings at 10.5 feet.

Ground water was encountered at depths ranging from 4.2 to 4.7 feet below existing grades. These levels correspond to an elevation of approximately +1 feet.

5.0 DISCUSSION

Based on the results of our field exploration, laboratory testing, and engineering analysis, it is our opinion that the site is suitable for construction of the proposed parking lot from a geotechnical engineering standpoint.

Potential main geotechnical concerns at this site include:

- Presence of near surface clayey soils that are loose and wet. These deposits are not suitable for pavement support; and
- Presence of soft and compressible lagoonal deposit at the site. New fills placed in this area could result in ground settlement.

More detailed comments and recommendations are presented in the following sections.

6.0 RECOMMENDATIONS

6.1 SITE PREPARATION

1. Prior to grading, the areas of the proposed construction should be prepared by stripping off all vegetation and the top 3 to 6 inches of soil containing roots and debris. The stripped and grubbed materials should be hauled to a suitable off-site disposal site.

2. The amount of site grading fill should be kept to as small as practical to reduce the potential of areal and ground settlements.

3. The top 6 inches of subgrade or areas to receive fill should be scarified, thoroughly moisture conditioned to between optimum and 3 percent wet of optimum moisture content, and compacted to at least 90 percent of relative compaction.

   Relative compaction in this letter is defined as the dry unit weight of the compacted material expressed as a percentage of the maximum dry unit weight of the same material based on ASTM D1557-91 test procedures.

   Any soft or yielding zones observed during the subgrade compaction should be treated by removing the soft or loose materials to firm soils and replacing them with properly compacted structural fill.

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

results are presented on Plate 6. The moisture-density relations and CBR test results are presented on Plates 7 and 8, respectively.

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   Any soft or yielding zones observed during the subgrade compaction should be treated by removing the soft or loose materials to firm soils and replacing them with properly compacted structural fill.

6.2 FILL MATERIALS, PLACEMENT AND COMPACTION

1. The on-site clayey soils are not suitable for use as structural fill, but may be stockpiled for possible reuse in non-structural or landscape areas provided they conform to the requirements of the landscape architect.

2. Structural fill should consist of a granular, well graded soil, free of organics, vegetation, debris, and particles greater than 3 inches in maximum dimension. It should be non-expansive with less than 15 percent passing a U.S. No. 200 standard sieve. It should have a California Bearing Ratio (CBR) value of at least 25, a liquid limit of 25 percent or less, and a plasticity index of 10 or less.

   Structural fill should be placed in not more than 8-inch thick loose lifts, moisture conditioned to within 2 percent of the optimum moisture content, and compacted to at least 95 percent relative compaction.

3. Fills in landscape and non-structural areas should be relatively free of organic matter, debris, and particles larger than 6 inches in maximum dimension.

   Fills in landscape and non-structural areas should be placed in not more than 10-inch thick loose lifts, moisture conditioned to between optimum moisture content and 3 percent wet of optimum moisture content, and compacted to at least 90 percent of relative compaction.

4. The site grading fill should be placed as early as possible to allow a portion of the fill settlements to occur.

6.3 GUIDELINES FOR FLEXIBLE PAVEMENT

1. Assuming that the proposed parking lot is used primarily for passenger cars, vans, and trucks, and based on an assumed subgrade CBR value of 10, the following flexible pavement section is recommended:

   - 2 inches of asphaltic concrete (AC);
   - 6 inches of untreated basaltic aggregate base course; and
   - 6 inches of aggregate subbase course.

   The base and subbase courses should extend horizontally at least 12 inches beyond the edges of the AC pavement limits.

2. The top 6 inches of the subgrade below paved areas should be scarified and thoroughly moisture conditioned to between optimum and 3 percent wet of optimum moisture content for this material. It should be compacted to at least 95 percent of relative compaction.

3. We understand that the travel way portions of the parking lot may be subjected to periodic construction equipment traffic for dike maintenance. It is recommended that the subbase course be increased to at least 12 inches in these areas.

4. The base course should conform to Section 31 of the City and County of Honolulu Standard Specifications for Public Works Construction, dated September 1986, and hereafter referred to as Standard Specifications. It should have a nominal size of 1.5 inches.

5. The subbase course should conform to the requirements of Section 30 of the Standard Specifications. It should be placed over the compacted subgrade as soon as possible to reduce the potential of drying and loosening of the subgrade soil.

6. The subbase and base course should be placed in not more than 8-inch thick loose lifts, moisture conditioned to within 2 percent of the optimum moisture contents for these materials, and compacted to at least 95 percent of relative compaction.

7. Concrete sidewalks should be underlain by at least 6 inches of base course. The base course should extend at least 6 inches beyond the sidewalk limits.

7.0 PLANS/SPEC REVIEW AND CONSULTATION DURING CONSTRUCTION

During the design, we plan to review the geotechnical sections of the pre-final plans and specifications to check that the intent of our recommendations have been properly reflected in the contract documents.

During the construction, we plan to conduct a site visit during the parking lot construction to observe subsurface conditions encountered in the pavement subgrade foundation excavation and to check on bearing materials and cleaning.

8.0 LIMITATIONS

This letter has been prepared for the use of Hawaii Pacific Engineers, Inc. (HPE) and HPE's designated designers and engineers in accordance with generally accepted soils and

foundation engineering practices. No other warranty or guarantee, expressed or implied, is made as to the professional advice included in this letter and none should be inferred.

This letter has been developed for the use of HPE and HPE's designated designers and engineers for the proposed parking lot to be constructed at Kawainui Community Park in Kailua, Oahu. It does not contain sufficient information for the purposes of other parties or for other uses.

This letter does not reflect variations which may occur in the subsurface and groundwater conditions between borings. The nature and extent of variations in the subsurface and groundwater conditions may not become evident until construction.

Groundwater was encountered in our borings drilled at the time of our field exploration. However, fluctuations in the groundwater level may occur due to variations in tide, rainfall, seepage, temperature and other factors that may be different for the conditions that existed at the tine of our measurements.

The comments and recommendations presented in this letter are based on the anticipated construction described herein. Should the actual construction differ from that described in this letter, we should be notified and retained to check if any modifications to the recommendations presented in this letter are needed. The recommendations presented in this letter will not be valid unless the changes are reviewed by us and the recommendations of this letter verified or modified by us in writing.

The field exploration portion of this study may not have disclosed the presence of underground structures such as cesspools, drywells, storage tanks, buried debris, landfills, cavities, void, etc. that may be present at the site. Should these items be encountered during construction, we should be notified and retained to provide recommendations for their disposal and/or treatment. Assessment of the presence or absence of these structures was not included in the scope of this study.

The scope of our services for this project was limited to conventional geotechnical services and did not include any environmental assessment or evaluations. Silence in this letter regarding any environmental aspects of the site does not indicate the absence of potential environmental problems.

- o0o -

The following plates are attached and complete this consultation letter.

Plate 1	-	Map of Area
Plate 2	-	Plot Plan
Plates 3.1 through and 3.3	-	Log of Borings, Borings 1 through 3
Plates 4.1 and 4.2	-	Unified Soil Classification System
Plates 5.1 and 5.2	-	Atterberg Limits
Plate 6	-	Gradation Curves
Plate 7	-	Compaction Curve
Plate 8	-	California Bearing Ratio (CBR) test

GLEN Y.F. LAU
LICENSED PROFESSIONAL ENGINEER
No. 6055-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

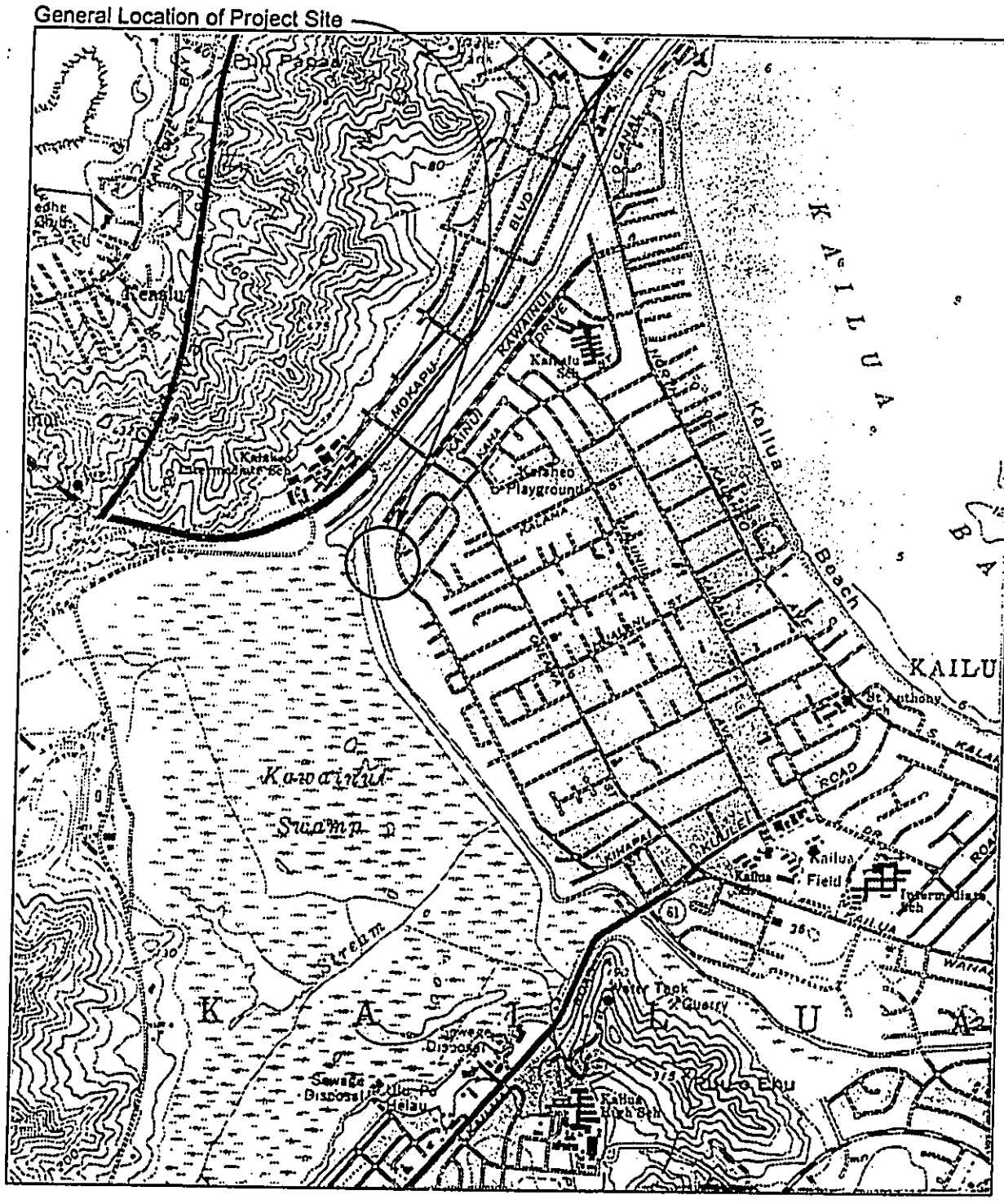
Yours very truly,

PACIFIC GEOTECHNICAL ENGINEERS, INC.

Glen Y.F. Lau, P.E.
President

GYL:tlg(3771-043 consult ltr 001.wpd)
(Three copies submitted)

General Location of Project Site



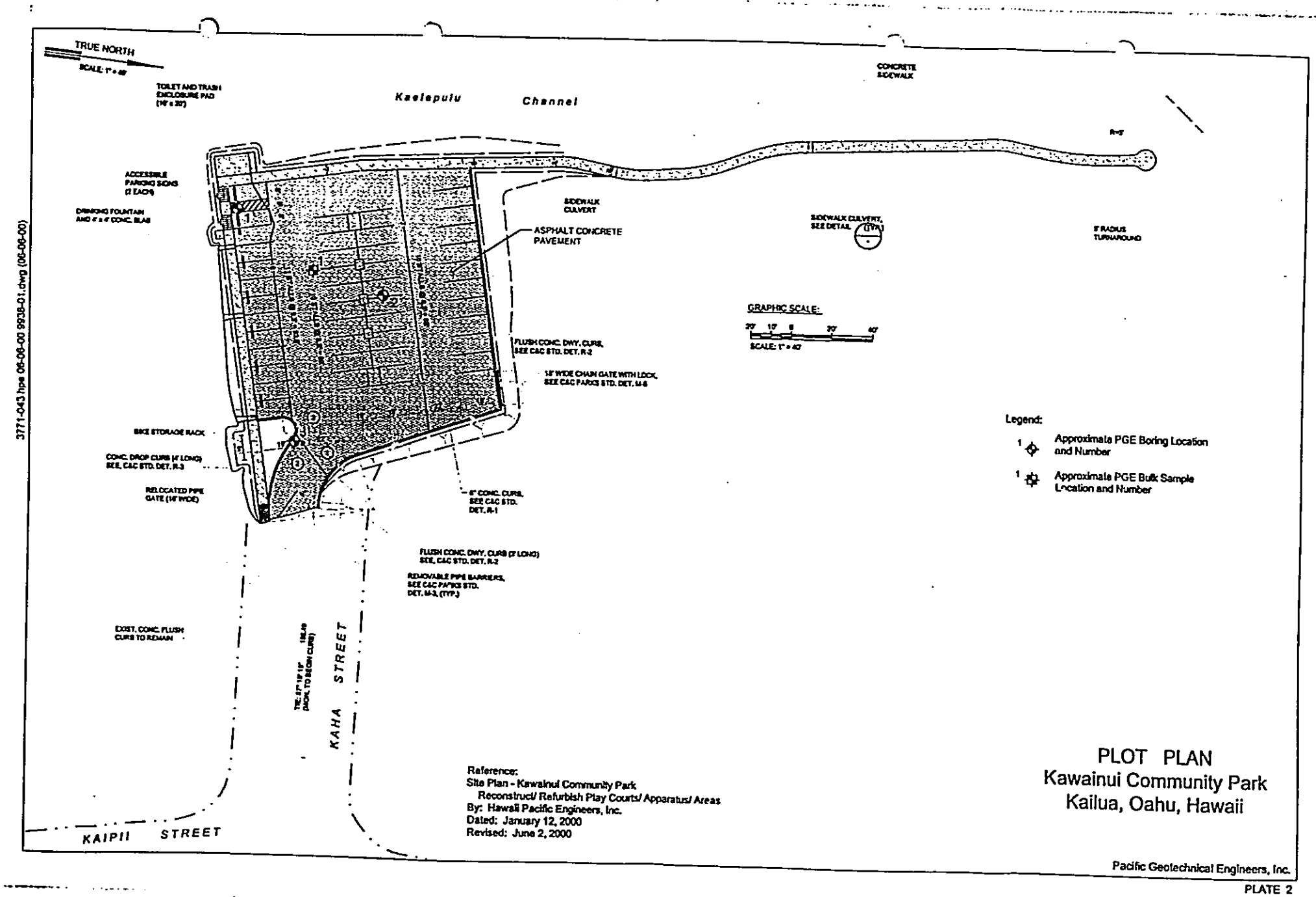
Contour Interval 40 Feet
Datum Is Mean Sea Level
Depth Curves In Feet – Datum Is Mean Lower Low Water

MAP OF AREA

Reference:
U.S.G.S. Topographic Map
Mokapu, Oahu, Hawaii
Dated: 1983

Pacific Geotechnical Engineers, Inc.

PLATE 1



3771-043.hpe 06-06-00 9936-01.dwg (06-06-00)

Reference:
Site Plan - Kawainui Community Park
Reconstruct/ Refurbish Play Courts/ Apparatus/ Areas
By: Hawaii Pacific Engineers, Inc.
Dated: January 12, 2000
Revised: June 2, 2000

PLOT PLAN
Kawainui Community Park
Kailua, Oahu, Hawaii

Pacific Geotechnical Engineers, Inc.

PLATE 2

PROJECT Kawainui Community Park JOB No. 3771-043

LOCATION Kailua, Oahu, Hawaii DRAWN BY tlg

BORING 1 (Page 1 of 1)

SURFACE ELEVATION +6.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO			BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
MOISTURE CONTENT %	DRY UNIT WEIGHT (pcf)	CORE TYPE	RECOVERY %	ROD % or (RQD) %						
13	96				75				SM	Light brown silty fine coralline sand, damp (fill)
										grades light reddish yellow, dense, and with coralline gravel
						2.5			GC	Light brown and reddish yellow clayey coralline gravel, loose, with coralline sand, and trace of roots, wet to saturated (fill)
24	91				15					
						5				(Water level at 1007 hours on 05-08-00)
					6				SM	Light gray silty coralline sand, very loose, with shells, saturated (lagoonal deposit)
24	99				26	7.5				grades light brown and light gray, medium dense, and with coralline gravel
									GM	Light gray silty coralline gravel, loose, with coralline sand and some shells, saturated (lagoonal deposit)
29	96				16	10				

Boring completed at 10.5 feet on 05-08-00.

NOTES:
- ■ – Relatively undisturbed sample
- ⊠ – Disturbed sample
- □ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 3.1

PROJECT Kawainui Community Park JOB No. 3771-043

LOCATION Kailua, Oahu, Hawaii DRAWN BY tlg

BORING 2 (Page 1 of 1)

SURFACE ELEVATION +6.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO			BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
MOISTURE CONTENT %	DRY UNIT WEIGHT (pcf)	CORE TYPE	RECOVERY %	ROD % or (RQI) %						
									SM	Light brown silty fine coralline sand, damp (fill)
10					26					grades medium dense
						2.5			CH	Mottled yellowish red and grayish brown fat clay, very stiff, with some basaltic gravel and trace of coralline sand and gravel, moist (fill)
20	97				25				SC	Light brown clayey coralline sand, loose to medium dense, wet to saturated (fill)
						5			SM	Light gray silty coralline sand, very loose, with shells, saturated (lagoonal deposit)
34	87				8					(Water level at 1005 hours on 05-08-00)
						7.5			GM	grades loose
26	100				20					Light gray silty coralline gravel, loose, with coralline sand and some shells, saturated (lagoonal deposit)
					7					grades very loose, and with a seam of silty coralline sand
						10				Boring completed at 10.5 feet on 05-08-00.

NOTES:
- ■ – Relatively undisturbed sample
- ⊠ – Disturbed sample
- ☐ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 3.2

PROJECT Kawainui Community Park JOB No. 3771-043

LOCATION Kailua, Oahu, Hawaii DRAWN BY tlg

BORING 3 (Page 1 of 1)

SURFACE ELEVATION +5.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO			BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
MOISTURE CONTENT %	DRY UNIT WEIGHT (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %						
									SM	Grayish brown silty coralline sand, with some basaltic and coralline gravel, damp (fill)
20	99				26				GC	Light brown and reddish yellow clayey coralline gravel, medium dense, with coralline sand, moist (fill)
						2.5				
46	71				24				ML	Dark olive gray elastic silt, very stiff, with some fine shells and highly weathered basaltic gravel, wet to saturated (fill)
										(Water level at 1104 hours on 05-08-00)
						5			SM	Light gray silty coralline sand, medium dense, with some shells, saturated (lagoonal deposit)
32	87				27					
					19	7.5			GM	Light gray silty coralline gravel, loose, with coralline sand, saturated (lagoonal deposit)
					10	10				grades very loose
										Boring completed at 10.5 feet on 05-08-00.

NOTES:
- ■ – Relatively undisturbed sample
- ⊠ – Disturbed sample
- ☐ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 3.3

CHECKED BY/DATE

UNIFIED SOIL CLASSIFICATION SYSTEM – (ASTM D2487–93)

MAJOR DIVISIONS			LETTER SYMBOL	GRAPHIC SYMBOL	GROUP NAMES
COARSE–GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVELS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS LESS THAN 5% FINES	GW		WELL–GRADED GRAVEL, WELL–GRADED GRAVEL WITH SAND
			GP		POORLY–GRADED GRAVEL, POORLY–GRADED GRAVEL WITH SAND
		GRAVELS WITH MORE THAN 12% FINES	GM		SILTY GRAVEL, SILTY GRAVEL WITH SAND
			GC		CLAYEY GRAVEL, CLAYEY GRAVEL WITH SAND
	SANDS 50% OR MORE OF COARSE FRACTION PASSES NO. 4 SIEVE	CLEAN SAND LESS THAN 5% FINES	SW		WELL–GRADED SAND, WELL–GRADED SAND WITH GRAVEL
			SP		POORLY–GRADED SAND, POORLY–GRADED SAND WITH GRAVEL
		SANDS WITH MORE THAN 12% FINES	SM		SILTY SAND, SILTY SAND WITH GRAVEL
			SC		CLAYEY SAND, CLAYEY SAND WITH GRAVEL
FINE–GRAINED SOILS 50% OR MORE PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML		SILT, SILT WITH SAND OR GRAVEL, SANDY OR GRAVELLY SILT
			CL		LEAN CLAY, LEAN CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY SILT
			OL		ORGANIC SILT OR CLAY, ORGANIC SILT OR CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY ORGANIC SILT OR CLAY
	SILTS AND CLAYS LIQUID LIMIT 50 OR MORE		MH		ELASTIC SILT, ELASTIC SILT WITH SAND OR GRAVEL, SANDY OR GRAVELLY ELASTIC SILT
			CH		FAT CLAY, FAT CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY FAT CLAY
			OH		ORGANIC SILT OR CLAY, ORGANIC SILT OR CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY ORGANIC SILT OR CLAY
HIGHLY ORGANIC SOILS			PT		PEAT

NOTE:
DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE CLASSIFICATIONS.
REFER TO ASTM D2487 FOR BORDERLINE CLASSIFICATIONS GW–GM, GW–GC, GP–GM, GP–GC, SW–SM, SW–SC, SP–SM, AND SP–SC.

PGE JOB NO. 9011 USCS3.DWG

UNIFIED SOIL CLASSIFICATION SYSTEM
(SHEET 1 OF 2)

Pacific Geotechnical Engineers, Inc.

PLATE 4.1

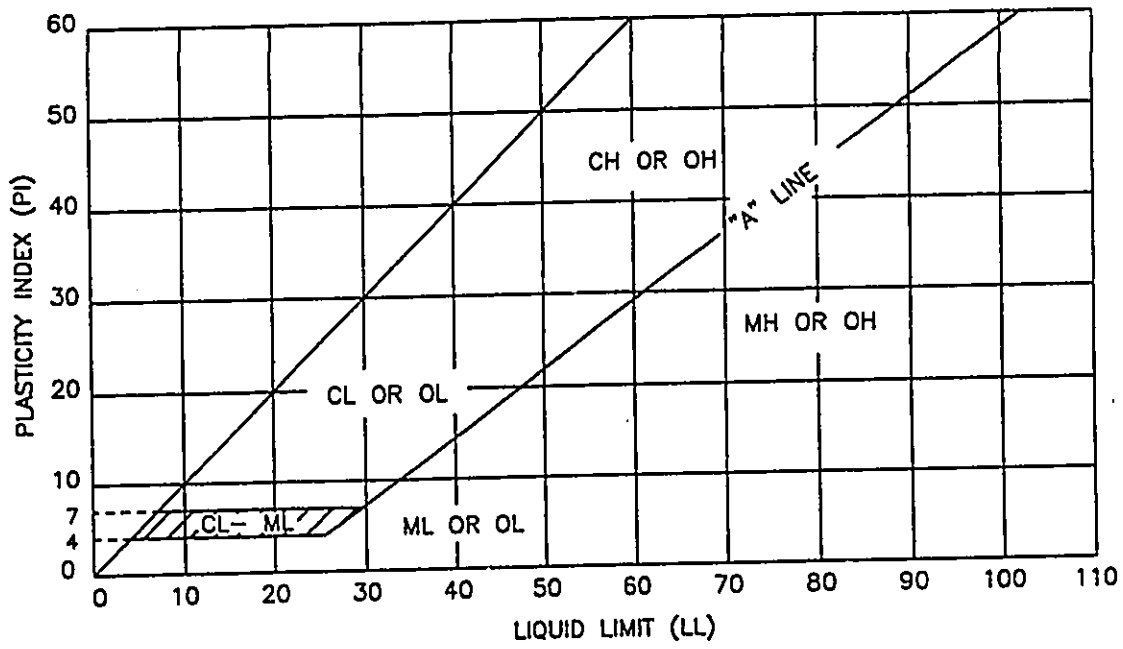
CHECKED BY/DATE:

GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE			
	LOWER LIMIT		UPPER LIMIT	
	MILLIMETERS	SIEVE SIZE **	MILLIMETERS	SIEVE SIZE **
SAND				
FINE	0.075	#200 **	0.425	#40 **
MEDIUM	0.425	#40 **	2.00	#10 **
COARSE	2.00	#10 **	4.75	#4 **
GRAVEL				
FINE	4.75	#4 **	19.0	3/4" *
COARSE	19.0	3/4" *	75.0	3" *
COBBLES	75.0	3" *	300	12" *
BOULDERS	300	12" *	---	---

** U.S. STANDARD SIEVE * SQUARE OPENINGS

PLASTICITY CHART



FOR CLASSIFICATION OF FINE-GRAINED SOILS AND FINE-GRAINED FRACTION OF COARSE-GRAINED SOILS

NOTE:
WHEN SHOWN ON THE BORING LOGS, THE FOLLOWING TERMS ARE USED TO DESCRIBE THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE COMPACTNESS OF COHESIONLESS SOILS.

COHESIVE SOILS

APPROXIMATE SHEAR STRENGTH IN KSF

VERY SOFT	LESS THAN 0.25
SOFT	0.25 TO 0.5
MEDIUM STIFF	0.5 TO 1.0
STIFF	1.0 TO 2.0
VERY STIFF	2.0 TO 4.0
HARD	GREATER THAN 4.0

COHESIONLESS SOILS

VERY LOOSE	THESE ARE USUALLY BASED ON AN EXAMINATION OF SOIL SAMPLES, PENETRATION RESISTANCE, AND SOIL DENSITY DATA.
LOOSE	
MEDIUM DENSE	
DENSE	
VERY DENSE	

UNIFIED SOIL CLASSIFICATION SYSTEM

(SHEET 2 OF 2)

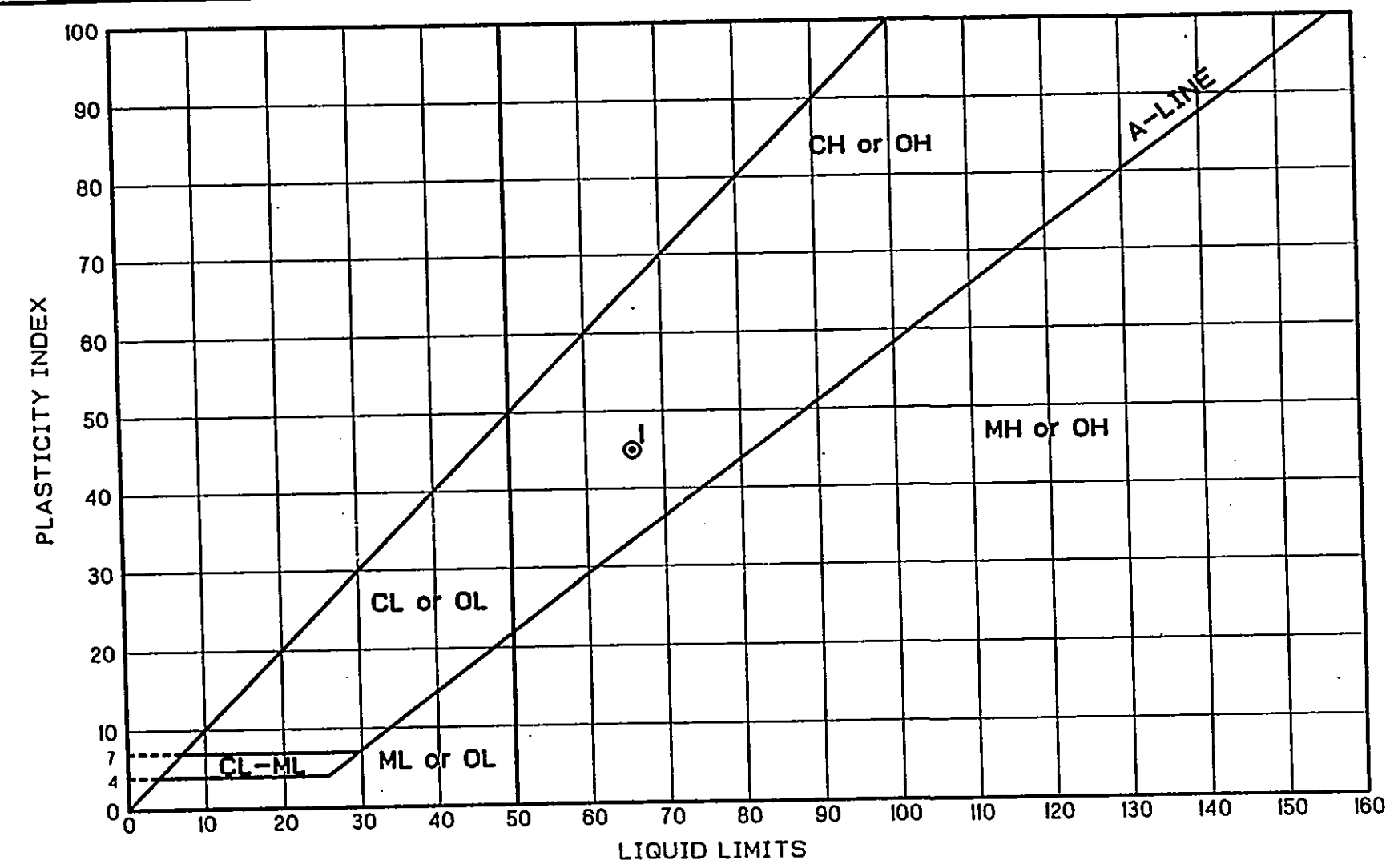
Pacific Geotechnical Engineers, Inc.

PLATE 4.2

PGE JOB NO. 9011 USCS4.DWG

PROJECT Kawainui Community Park JOB NUMBER 3771-043

LOCATION Kailua, Oahu, Hawaii DRAWN BY tlg DATE DRAWN 05-16-00



ATTERBERG LIMITS

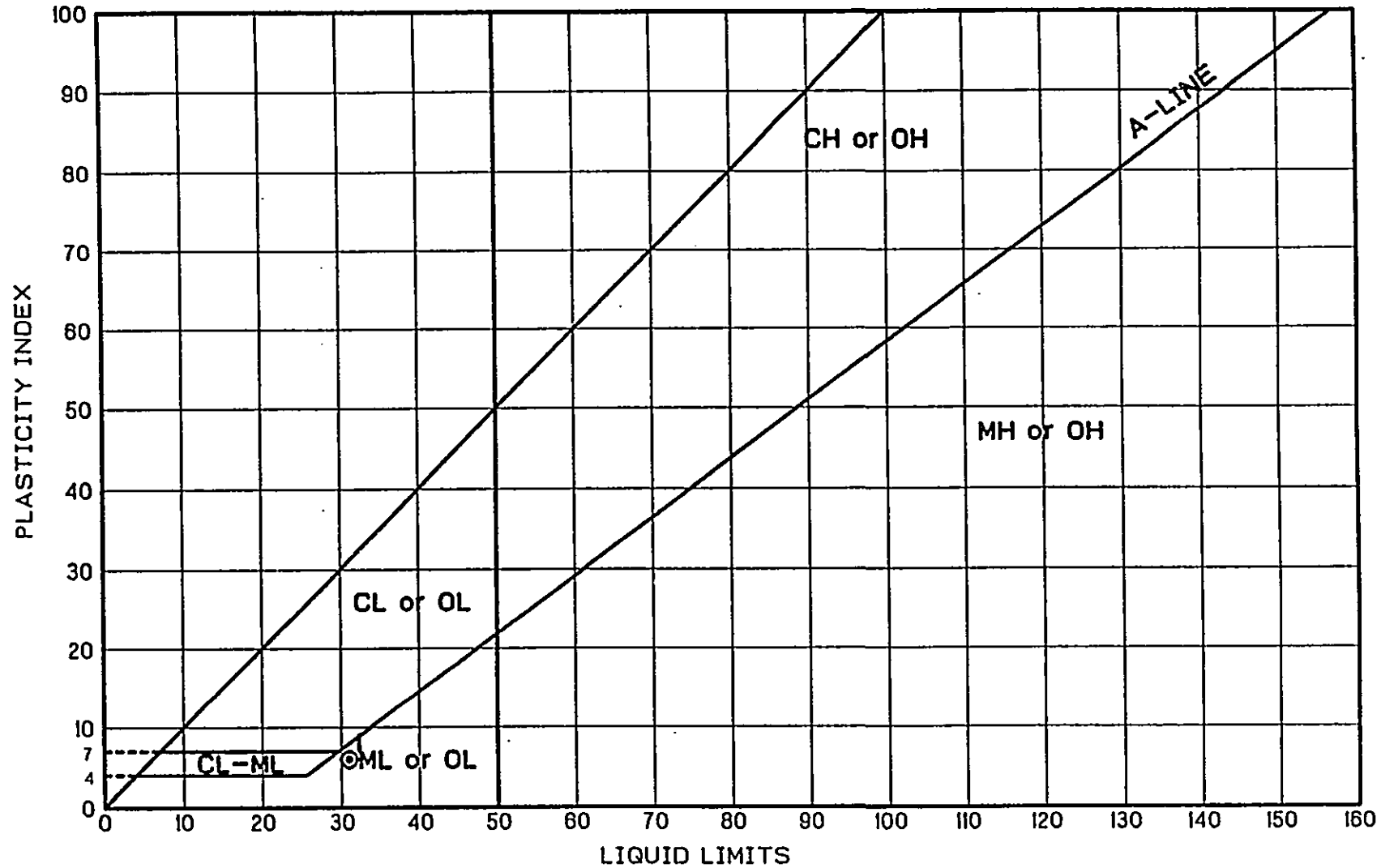
KEY	LOCATION	SAMPLE DEPTH (ft)	LIQUID LIMIT	PLASTICITY INDEX
1	Boring 3	1.2	66	45

Pacific Geotechnical Engineers, Inc.

Plate 5.1

PROJECT Kawainui Community Park JOB NUMBER -04

LOCATION Kailua, Oahu, Hawaii DRAWN BY llg DATE DRAWN 05-16-00



ATTERBERG LIMITS

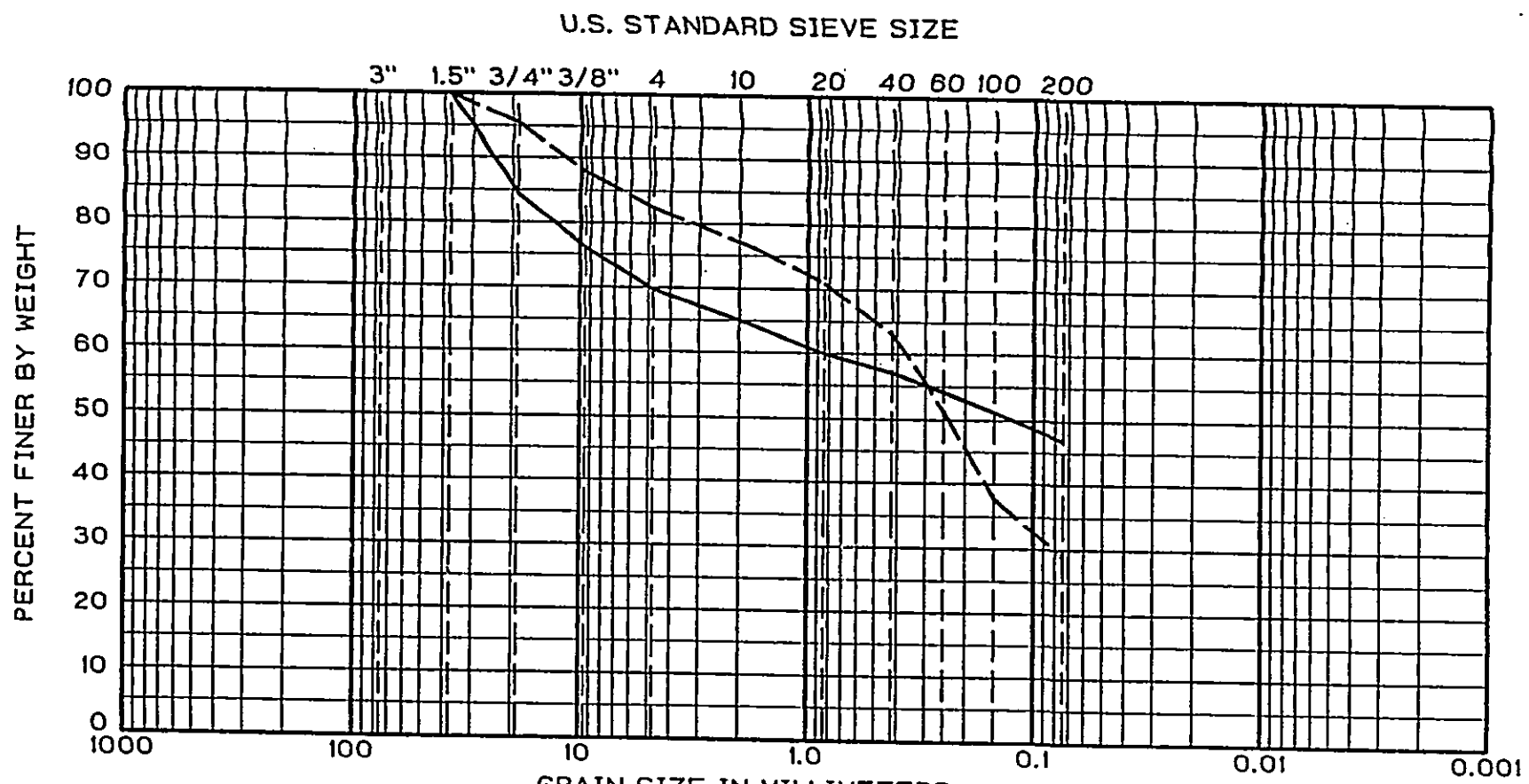
KEY	LOCATION	SAMPLE DEPTH (ft)	LIQUID LIMIT	PLASTICITY INDEX
1	Bulk 1	0 - 2	31	6

Pacific Geotechnical Engineers, Inc.

Plate 5.2

PROJECT Kawainui Community Park JOB NUMBER 3771-043

LOCATION Kailua, Oahu, Hawaii DRAWN BY llg DATE DRAWN 05-16-00



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH (ft)	CLASSIFICATION		NAT. WC	LL	PL	PI	SYMBOL
Boring 3	1.2	GC	Lt brown & reddish yellow clayey coralline gravel w/ coralline sand					———
Bulk 1	0-2	SM	Light brown silty fine coralline sand with basaltic & coralline gravel					— — — —

GRADATION CURVE

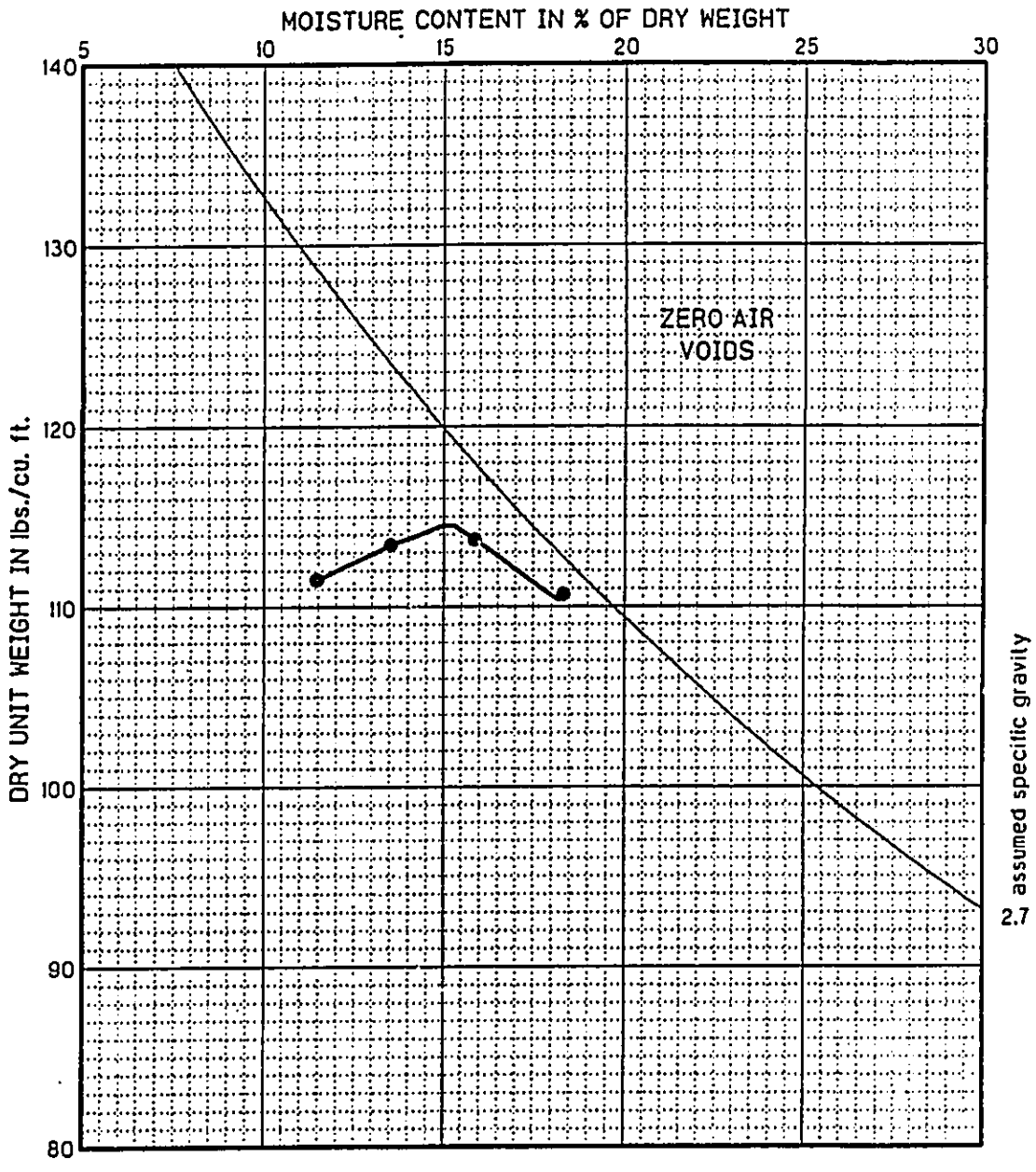
Pacific Geotechnical Engineer, Inc.

Plate 6

SAMPLE DEPTH 0 - 2 ft.
ELEVATION 5 ft.±
SOIL Light brown silty fine coralline sand with gravel
COMPACTION METHOD ASTM D1557-91
OPTIMUM MOISTURE CONTENT 15.5 %
MAXIMUM DRY UNIT WEIGHT 114.5 pcf

JOB NUMBER: 3771-043
PROJECT: Kawainui Community Park
Kailua, Oahu, Hawaii
DRAWN BY: tlg (06/06/2000)

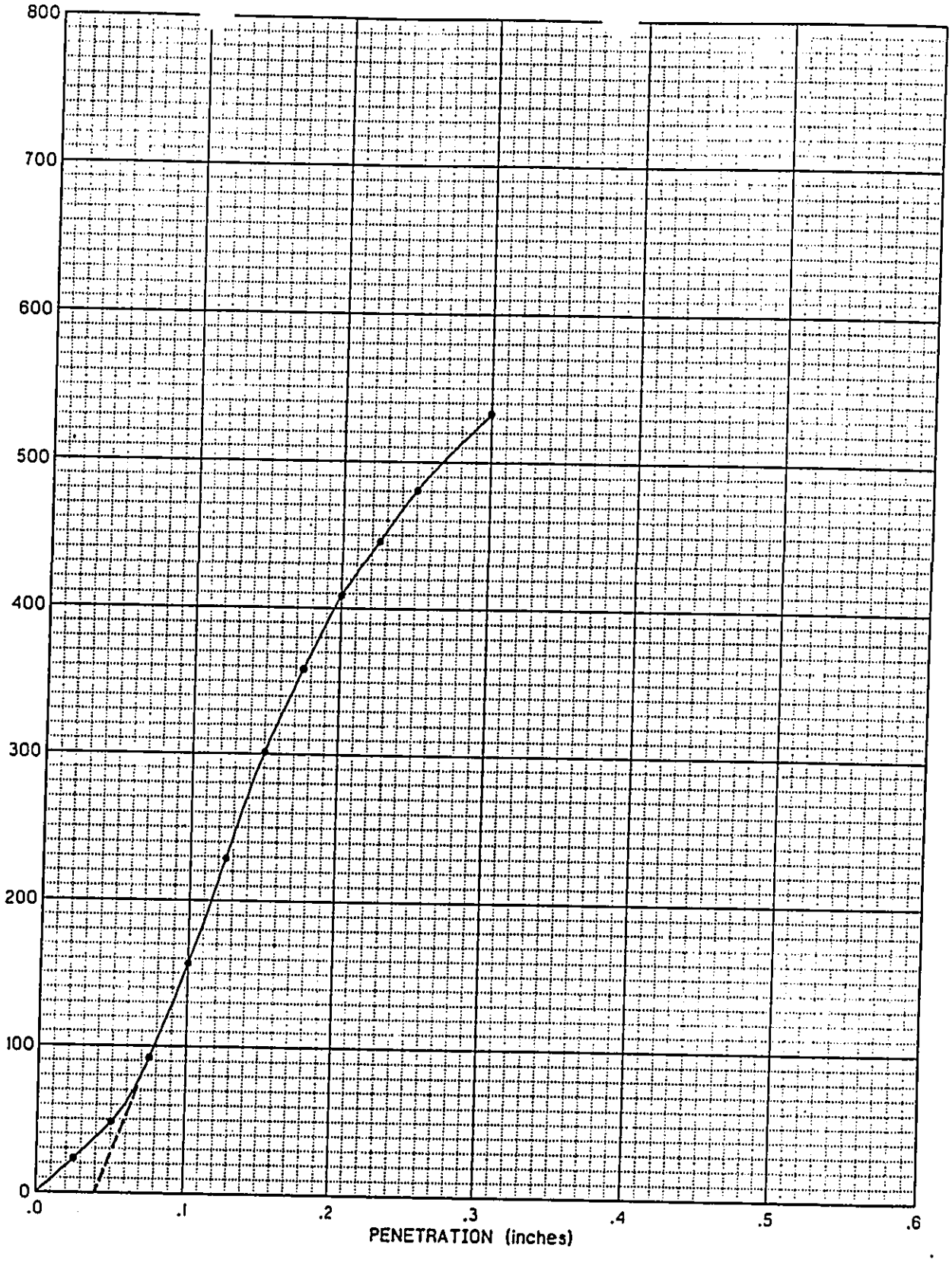
BULK 1



COMPACTION TEST DATA

Pacific Geotechnical Engineers, Inc.
PLATE 7

PROJECT Kahana Community Park JOB NUMBER 3111-043 DATE 05-16-00 DRAWN BY HG



LABORATORY CALIFORNIA BEARING RATIO (CBR) TEST RESULTS

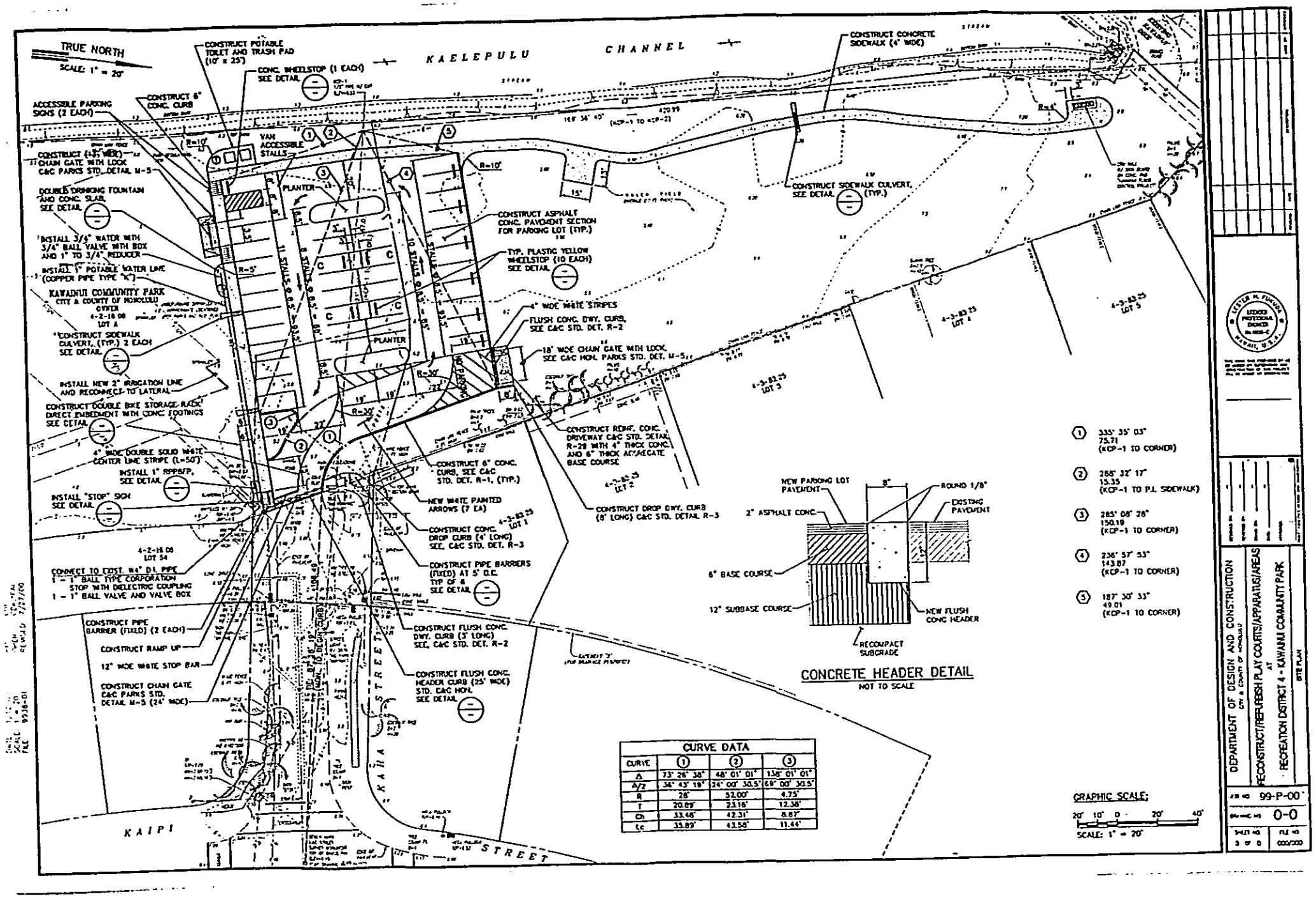
Bulk No.	Depth (ft)	Before Soaking		After Soaking			Laboratory CBR Value	
		Moisture Content (%)	Dry Unit Weight (pcf)	Moisture Content (%)	Dry Unit Weight (pcf)	% Swell	@ 0.1"	@ 0.2"
1	0-2	12	109.5	19	107.6	1.7	27	31

Soil Description (USCS) Light brown silty fine coralline sand with gravel

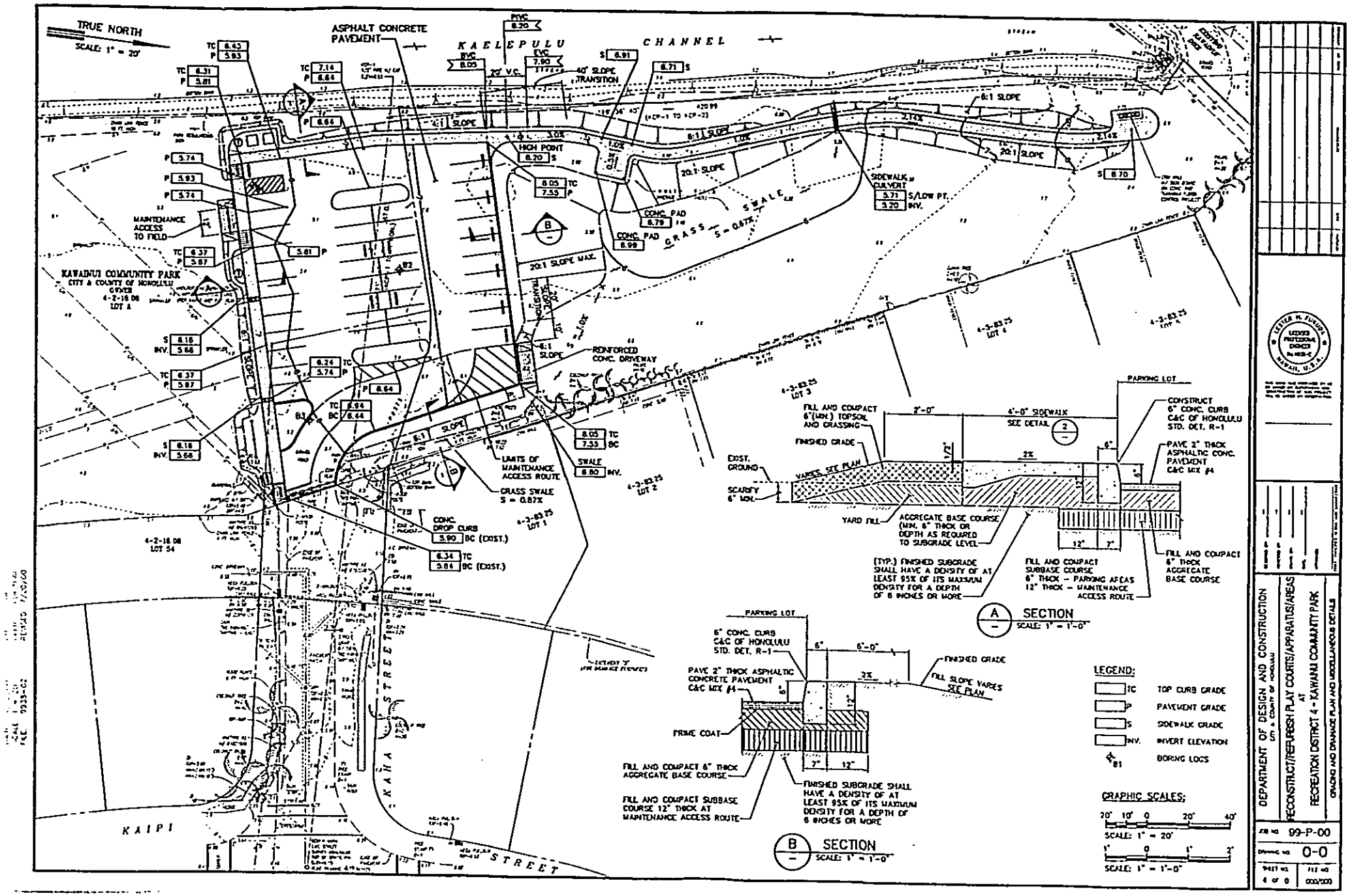
Test Method ASTM D 1883-94

Pacific Geotechnical Engineers, Inc.

Plate 8



CURVE	①	②	③
Δ	73° 26' 36"	48° 01' 01"	138° 01' 01"
Δ/2	36° 43' 19"	24° 00' 30.5"	69° 00' 30.5"
R	28'	52.00'	4.75'
T	20.89'	23.16'	12.38'
CH	33.46'	42.31'	8.87'
Lc	35.89'	43.58'	11.44'


TRUE NORTH
SCALE: 1" = 20'
ASPHALT CONCRETE PAVEMENT
KAELEPULU CHANNEL
PVC 8.30
EVC 7.90
PVC 8.05
20' V.C.
40' SLOPE TRANSITION
HIGH POINT 8.20
6:1 SLOPE
20:1 SLOPE
20:1 SLOPE MAX.
SIDEWALK CULVERT
S/LOW PT. 5.71
INV. 5.20
CONC. PAD 6.79
CONC. PAD 6.98
GRASS SWALE S = 0.67%
MAINTENANCE ACCESS TO FIELD
KAWAINUI COMMUNITY PARK
CITY & COUNTY OF HONOLULU
OWNER
4-2-16:06
LOT A
REINFORCED CONC. DRIVEWAY
LIMITS OF MAINTENANCE ACCESS ROUTE
GRASS SWALE S = 0.87%
SWALE 6.80 INV.
CONC. DROP CURB 5.90 BC (EXIST.)
6.34 TC
5.84 BC (EXIST.)
4-2-16:08
LOT 54
4-3-83:25 LOT 1
4-3-83:25 LOT 2
4-3-83:25 LOT 3
4-3-83:25 LOT 4
KAIPI STREET
KAHA STREET
PARKING LOT
2'-0"
4'-0" SIDEWALK SEE DETAIL 2/1
CONSTRUCT 6" CONC. CURB C&C OF HONOLULU STD. DET. R-1
PAVE 2" THICK ASPHALTIC CONC. PAVEMENT C&C MIX #4
FILL AND COMPACT 6"(MIN.) TOPSOIL AND GRASSING
FINISHED GRADE
EXIST. GROUND
SCARIFY 6" MIN.
YARD FILL
AGGREGATE BASE COURSE (MIN. 6" THICK OR DEPTH AS REQUIRED TO SUBGRADE LEVEL
(TYP.) FINISHED SUBGRADE SHALL HAVE A DENSITY OF AT LEAST 95% OF ITS MAXIMUM DENSITY FOR A DEPTH OF 6 INCHES OR MORE
FILL AND COMPACT SUBBASE COURSE 6" THICK - PARKING AREAS 12" THICK - MAINTENANCE ACCESS ROUTE
FILL AND COMPACT 6" THICK AGGREGATE BASE COURSE
A SECTION
SCALE: 1" = 1'-0"
PRIME COAT
FILL AND COMPACT 6" THICK AGGREGATE BASE COURSE
FILL AND COMPACT SUBBASE COURSE 12" THICK AT MAINTENANCE ACCESS ROUTE
FINISHED SUBGRADE SHALL HAVE A DENSITY OF AT LEAST 95% OF ITS MAXIMUM DENSITY FOR A DEPTH OF 6 INCHES OR MORE
FILL SLOPE VARIES SEE PLAN
B SECTION
SCALE: 1" = 1'-0"
LEGEND:
TC TOP CURB GRADE
P PAVEMENT GRADE
S SIDEWALK GRADE
INV. INVERT ELEVATION
B1 BORING LOCS
GRAPHIC SCALES:
20' 10' 0 20' 40'
SCALE: 1" = 20'
1' 0 1' 2'
SCALE: 1" = 1'-0"
DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU
RECONSTRUCT/REFURBISH PLAY COURTS/APPARATUS/AREAS AT
RECREATION DISTRICT 4 - KAWAINUI COMMUNITY PARK
GRADING AND DRAINAGE PLAN AND MISCELLANEOUS DETAILS
JOB NO. 99-P-00
DRAWING NO. 0-0
SHEET NO. 4 OF 8
FILE NO. 000/000

Archaeological Inventory Survey for the Kawainui Marsh Park Improvement Area Kailua, *Ahupua`a* of Kailua, Island of O`ahu (TMK 4-2-16: portion 01, portion 08)

by

Scott T. Kikiloi, B.A.,
Matt McDermott, B.A.,
and
Hallett H. Hammatt, Ph.D.

for

Kimura International Inc.

Cultural Surveys Hawaii
July 2000

ABSTRACT

At the request of Glenn T. Kimura of Kimura International Inc., Cultural Surveys Hawaii, Inc., carried out an archaeological inventory survey for the proposed improvements to the parking lot of the Kawainui Marsh Park, in the *Ahupua`a* of Kailua, district of Ko`olaupoko, Island of O`ahu (TMK 4-2-16: portion 01, portion 08). The project area is located on the margin of Kawainui Marsh, northwest of Kailua Town, at the *mauka* (west) end of Kaha Street. The proposed improvements to the Kawainui Marsh Park include the construction of a 18,000 ft², 49 stall, parking lot, restroom facilities, landscaping and beautifying the area, and the installation of walkways and picnic facilities. The inventory survey investigations consisted of pedestrian inspection and sub-surface testing of the proposed construction site, as well as historical document and oral history research for the *Ahupua`a* of Kailua in general, and more specifically of the project area and its vicinity. No archaeological sites were observed during the pedestrian field inspection. Historic research indicated that if there were significant utilization (i.e., agricultural or habitation) along this area of Kawainui Marsh, remnants of this activity most likely would not have survived the extensive reworking of this area in association with the drainage engineering projects for Kawainui Marsh and the associated (and adjacent) Oneawa Drainage Canal. Based on the results of historical document research, pedestrian field inspection, and sub-surface testing of the project area, it appears that there are no historic properties within the project area and the proposed park improvements will have no effect on historic properties. No further historic preservation work is recommended for the project.

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I. INTRODUCTION

This archaeological inventory survey investigation of the proposed Kawainui Marsh Park Improvement Area was intended to fulfill the requirements outlined in the draft "Rules Governing Procedures for Historic Preservation Review" (1996, Hawaii administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 13, State Historic Preservation Division Rules, Chapter 276--"Rules Governing Minimal Standards for Archaeological Inventory Survey and Reports"). According to these rules an archaeological inventory survey is required "to identify and inventory any archaeological historic properties in a project area, in order to determine if significant historic properties are present." An archaeological inventory survey must 1) identify all historic properties within a parcel and 2) provide sufficient information from field documentation and historical background research to evaluate each historic property's significance. The five steps required for an archaeological inventory survey are:

1. Historical background research
2. Archaeological background research
3. Archaeological field survey
4. Consultation with individuals knowledgeable about the project area's history, in projects greater than 30 acres in size
5. Preparation of the archaeological inventory survey report, which presents the findings of the above four steps (13-276-3).

This archaeological inventory survey report has been prepared to fulfill the requirements outlined in chapter 13-276-8 "Archaeological inventory survey report."

A. Project Background

In February, 2000, Cultural Surveys Hawaii, Inc., (CSH) was contacted by Mr. Glenn T. Kimura of Kimura International Inc., to draw up a proposal for archaeological inventory survey investigations of an approximately 18,000 ft^2 area proposed as a "49 stall Parking Lot at the Kawainui Marsh Park" and associated park improvements. An initial assessment of the project area showed that the area had been previously graded level and there was to be no potential for surface historic properties. The inventory survey field work therefore focused on determining if subsurface historic properties were present. .

Historical background and previous archaeological research for the current inventory survey was accomplished in June, 2000. Field work for the project was conducted on June 17th, 2000. A total of one day of field work with an archaeological crew of 3 archaeologists, Victoria Creed, Ph.D., Matt McDermott, B. A., and Jesse York, was required. This work was conducted under the overall guidance of the project director, Hallett H. Hammatt, Ph.D. The backhoe service for the trenches were provided by Mike Masutani of Mike's Backhoe Service.

B. Project Area Description

The project area is located northwest of Kailua Town, in the *Ahupua`a of* Kailua, district of Ko`olaupoko, island of O`ahu (TMK 4-2-17: portion 04). It is located at the *mauka* end of Kaha Street, on the margin of Kawainui Marsh, see Figure 1. The area is currently a flat embankment, located *makai* of the Kawainui "inner" drainage canal. This parcel of land is the intersection of the Kawainui "inner" drainage canal, the Kawainui dike road, and the larger `Oneawa drainage canal, which is located immediately north and west of the project area.

The project area consist of four parts: 1) the main 49 stall, paved parking lot; 2) a small 10 x 20 ft enclosed restroom pad; 3) a gravel walkway which extends around the park and inner canal; and finally 4) scattered picnic facilities along the walkway. The selected area for the parking lot follows the alignment of a existing grass lot used for the Kawainui Park.

The project area is approximately 6 feet A. M. S. L. (M kapu Quad 1983, U.S.G.S). Vegetation is characterized by a combination of exotic grasses and weeds, *haole koa* (*Leucaena leucocephala*), and one large Monkey Pod tree (*Albizia saman*). Figures 7 through 11 show the vegetation within the project area. The northwest portion of the project area is heavily mulched, with a few small barren areas were observed which exposed the underlying soil that make up the leveled embankment. The soils within the project area are Mokuleia clay loam (Foot *et al.* 1972) which is a common soil that occurs in small areas near coastal plains. Rainfall in the Kailua area averages 1000 mm. (40 inches) per year (Giambelluca et al. 1986).

C. Scope of Work

One hundred percent of the project area was covered by systematic pedestrian sweeps during the survey. No surface historic properties were located in the project area. The bulk of the inventory survey work focused on determining whether or not subsurface historic properties were present. All work was done in accordance with the standards for inventory survey outlined by the Department of Land and Natural Resources/State Historic Preservation Division (DLNR/SHPD).

The scope of work for the archaeological inventory survey consisted of:

1. Research on historic and archaeological background, including search of historic maps, written records, Land Commission Award documents. Oral traditions and mythological accounts dealing with the region were also examined. This research focused on the specific area with general background on the *ahupua`a* and district and emphasized settlement patterns. This research established a cultural, historic, and archaeological context for the project area and served as a predictive model for the types of historic properties that might be encountered within the project area.

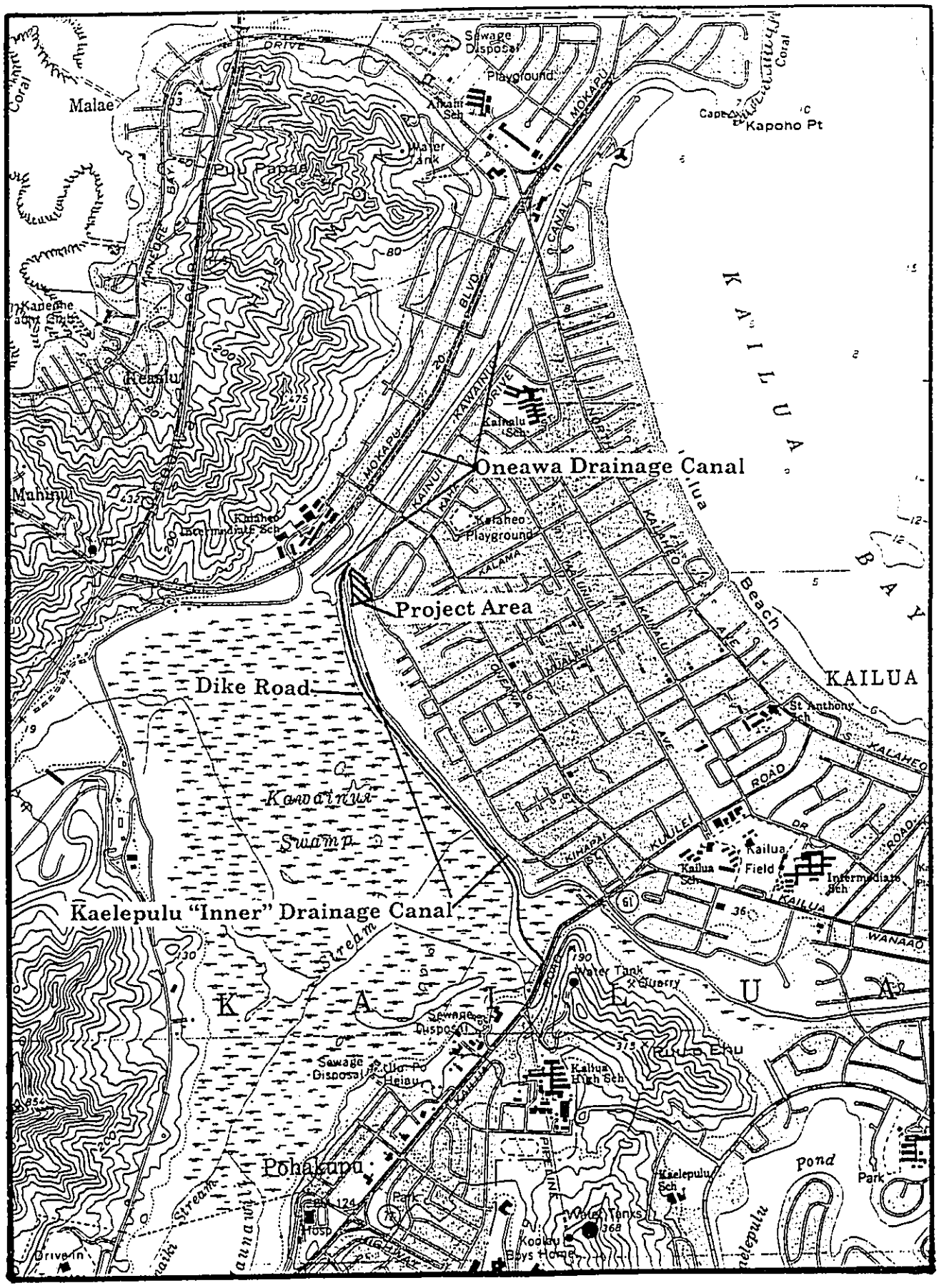

Figure 1 Portion of USGS 7.5 Minute Series Mokapu Quadrangle, Showing the Project Area and Geographic Features Mentioned in the Text

2. Previous archaeological investigation in the *ahupua`a* of Kailua were reviewed, and studies documenting archaeological features and human burials near the current project parcel were identified.

3. A complete pedestrian ground survey of the entire project area for the purpose of site inventory.

4. Sub-surface excavations were conducted to test for the presence of significant archaeological cultural deposits and features.

5. This survey report includes: a topographic map identifying the current survey area and previous archaeological study areas; historical and archaeological background sections summarizing pre-contact and post-contact land-use as it relates to the project area; a site predictive model; descriptions of test excavations with selected photographs; and recommendations based on all information specify what steps should be taken to mitigate impact of development on archaeological resources.

D. Methods

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

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected type and location of sub-surface pre and post-contact historic properties in the project areas.

Sub-surface testing consisted of the excavation of 8 backhoe trenches. These trenches were excavated to below the water table. A 70 cm wide bucket was used on the backhoe, and trenches were one bucket wide. Trench depth varied between 1.49-2.97 m. Trenches were placed to provide adequate coverage of all portions of the project parcel.

Three archaeologists were on site to conduct sub-surface investigations. Documentation included scale section profiles, sediment descriptions, and photographs of exposed trench sections. Sediment descriptions included Munsell color designations, texture and sediment size, compactness, structure, inclusions and cultural material present, and lower boundary attributes.

II. CULTURAL SETTING AND HISTORIC BACKGROUND

The history of the Kailua region of O`ahu has been documented in a number of studies including, but not limited to, Hall's(1997) "The History of Kailua", Creed and Chiogioji's (1991) "Facets of Maunawili Valley and Kailua *Ahupua`a* History", and Kelly and Nakamura's (1981) "Historical Study of Kawainui Marsh Area, Island of O`ahu". All of these studies detail the legendary history and oral traditions, the legendary rulers and personalities, the early historic accounts, land ownership and utilization changes during and following the Māhele, and the changes in land use from traditional to modern times. With so many sources already documenting Kailua's rich historical and cultural past, the purpose of this section is only to orient the present project area within the overall historical and cultural setting. For more detailed accounts of Kailua's past, the reader is referred to the above sources, as well as the ones cited in the following text.

A. Setting

Kailua *Ahupua`a* is the largest valley on the windward side of O`ahu, and the largest *Ahupua`a of the Ko`olaupoko District (approximately 15 km by 11 km).* Flanked by the *Ahupua`a* of Waimānalo on the southeast, Kāne`ohe on the northwest and Honolulu to the south, the *Ahupua`a* of Kailua is shaped like a rectangle. From the Ko`olau ridge line it extends down two descending ridge lines which provide the natural boundaries for the sides of the *Ahupua`a*. The fourth side of the rectangle is the reef line of Kailua Bay.

The natural environment includes the sand barrier upon which Kailua Town stands, the mountainous upland terrain and alluvial valleys of Maunawili, the largest fresh water marsh in Hawai`i (Kawainui Marsh), another inland pond (Ka`elepulu), approximately 18 permanent and intermittent streams, a freestanding mountain halfway between the shore and the Ko`olau (Olomana--1,643 ft.), several low ridge lines, and off-shore the Mokulua Islands, Mokole`a Rock, and Popoia Island. It comprises 11,885 acres of land according to the Boundary Commission Review of the mid-19th century, but in fact extends beyond the shore approximately a mile out to sea, to the reef.

During the estimated 1000 to 1500 years since initial Polynesian settlement, the sand barrier that forms the shore at Kailua Bay has provided a desirable location for residences with a sunny, dry beach area. The well-watered interior lands, including the two marsh/pond areas of Ka`elepulu and Kawainui and the many springs and streams of Maunawili, provided bountiful agricultural and resource gathering areas. During the 15$^{th}$ and 16$^{th}$ centuries Kailua O`ahu was the center of a large royal complex with ample playgrounds for sports and physical training, and recreation (Sterling and Summers 1978:231-232). Supporting this large complex was a most bountiful garden hinterland where fish, fowl, and vegetables were plentiful (*Ibid.*:227-228).

Mele or chants about Kailua frequently mention the two fishponds famous for their mullet and *awa*. They also tout the taro gardens of the area (see Beckwith 1979 and Drigot (1982), in the legendary *mo'olelo*, or epics (e.g. Hi`iakaikapoliopele, Kahinahinanui, Makalei Tree, Ka`ulu are a few of the stories). Early visitors (Bowser (1880), in particular) to the island also mention a wealth of birds in the area.

Beside a sunny beach area and uplands watered by frequent showers, other resources were easily available in Kailua. As the center of the caldera of the ancient Ko'olau Volcano (MacDonald and Abbott 1974:363) a basalt quarry (the present Ameron Quarry is built upon the site of the pre-contact quarry) for material for lithic tools was near at hand. Kailua was a residential district surrounded by *Ahupua`a* that were also highly cultivated and capable of providing ample resources for a large resident and visiting population. Kailua apparently also was a *pu`uhonua* (place of refuge) before Kamehameha I conquered the island of O`ahu. After this time the ancient *pu`uhonua* were abolished.

B. Oral Traditions and Legends

Legends and oral history provide stories for many of the place names and also give specific beliefs Hawaiians held and hold about the land. The name Kailua, meaning "two seas", apparently refers to the two large inland waters, Ka`elepulu Pond and Kawainui Pond (Pukui *et al.* 1974:69; Quebral 1991:14). That Kailua was a "fat" land, a land of plentiful food in all times, is suggested by several legends. The *Makalei*, or Fish-Attracting Tree was a mythological tree or stick which could summon fish from Kawainui. Reportedly located near the present day Hāmākua Street Bridge, it was described as a never failing source of a plentiful supply of food (Beckwith 1970:279-280 and Pukui and Elbert 1981:382, cited in Kelly and Nakamura 1981:5). Another tradition of the ample productivity of the Kailua region involves the edible, *haupia*-like mud, called *lepo`ai `ai*, which was available from Kawainui Marsh (Kelly and Nakamura 1981:5). This legend implies a bountiful Kailua where even the mud is edible.

Kailua is one of the places where, following their arrival on O`ahu from Kahiki, the *menehune* were assigned to live. These legendary workers are credited with the construction of numerous fish ponds and religious structures. Fornander points out that the term *menehune* in Tahitian had become the name for the lowest laboring class of people--suggesting a Tahitian origin for the term for the legendary workers (Fornander 1969:23).

There are legendary accounts of the prominent Mount Olomana, that is named after a great mythological giant and/or chief (Kelly and Nakamura 1981:1) Tradition also says Kawainui was inhabited by a *mo'o* (large dragon-like mythical creature) called Hauwahine, whose name literally means "female ruler". Her residency at Kawainui follows Haumea's, the earth-mother goddess whose name literally means "red ruler". She made sure all the people of the *Ahupua`a* shared in the pond's wealth and punished those who were greedy (Beckwith 1970:126).

Oral history notes that the stones overlooking Kawainui on Pu'u 'o 'Ehu are sacred to Hauwahine and her companion (Paki, 1976). The reason for this is connected to the ancient Hawaiian notion that the channel/canal beneath Pu`u o Ehu connects Kawainui and Ka`elepulu and was considered to be the coital connection between the two fishponds, giving the area great *mana*. Kawainui Marsh was considered male and Ka`elepulu Pond, female. They mated at Kawailoa according to a Hawaiian tradition (Paki 1976).

Traditional history credits Kailua as the residence of many prominent O`ahu ruling chiefs. There is `Olopana "who with his brother Kahikiula came to O`ahu from Kahiki . . .

He is said to have established several *heiau* in Kāne`ohe and Kailua, including Pahukini and Holomakani in the Kawainui area" (Kelly and Nakamura 1981:3). One of the earliest great chiefs to reside in Kailua was Kakuhihewa, who built himself a great house at `Alele in Kailua (*Ibid.*:5). At approximately the same time (the 16th century) another prominent chief, Kūali`i, born at Kalapawai, Kailua, and raised in Kualoa and Kailua, had his navel cutting ceremony at the *heiau* of Alala (present day Lanikai point), and, after being the hero of many battles, became the high chief of all O`ahu (*Ibid.*:6) In early historic times the conquering chiefs Kahekili followed by Kamehameha I resided in Kailua for a time (*Ibid.*:6-7).

C. Early Population Estimates

The drastic depopulation of the Hawaiian Islands following the introduction of Western disease has been documented in a number of sources (Bingham 1847; Stannard 1989; and Bushnell 1993). According to one estimate the population of Hawaiians and part-Hawaiians fell from approximately 300,000 in 1778 to 82,593 by 1850 (Schmitt 1968:43, 74, cited in Kelly and Nakamura 1981:10). Population counts from the 1830s place the population of Kailua at approximately 760 individuals (Schmitt 1973:19 cited in Kelly and Nakamura 1981:10). This low population figure is incongruous with the productivity of the region, but well in keeping with population decline estimates due to western disease. Westerners passing through Ko`olaupoko in the mid 1840's made note of the cold and flu symptoms among the native Hawaiians and that much formerly productive land appeared abandoned (Wyllie 1948:20 cited in Kelly and Nakamura 1981:10).

D. Early Historic Accounts

Historic accounts of Kailua before the 1850s are rare. One of the only accounts that could be located is that of Levi Chamberlain, a missionary who made a circuit around O`ahu to inspect the mission schools in 1828. This account is particularly important because Chamberlain travels through and describes the landscape in the immediate vicinity of the current project area. Chamberlain describes his progress from the settlement at Kailua through the low hills, today called the Kalaheo hills and the location of Kalaheo High School, that separate Kailua from Kāne`ohe.

> Directing our course towards Kāne`ohe, the next district, we were obliged to pass over a tract of low land mostly overflowed with water by the late rains. Here I was obliged to wade, as the distance was too great to admit of my being carried on the shoulders of my attendants, as was generally the case in passing a small stream of water. After emerging from the flat, our path was not improved, for we had now to walk through mud instead of water--we walked some distance along the steep hill, and at length by a winding path ascended to the top of it. We sat down to rest for a few minutes, and I found myself upon the summit of a ridge extending from the mountains in a right line to the sea and dividing the low lands of Kailua from those of Kaneohe. (Chamberlain Ms.:664 in Kelly and Nakamura 1981:7).

It is clear from this account that this west-northwest portion of Kailua, in the vicinity of the current project area, was low lying and prone to flooding. As we shall see in

later discussion, this does not appear to change with the passage of time.

E. Māhele Records

Māhele records are an important resource for determining land-use during the first half of the 19th century. In the great division of lands among Kamehameha III and his people between 1848 and 1853, 171 Land Commission Awards (LCAs) were claimed before the Board of Commissioners to Quiet Land Titles (Land Commission) in Kailua. Many persons claimed their land from the time of their *makuakane* (ancestors) but no one indicates any time farther back than the time of Kaloli (contemporaneous with Kamehameha I). The most recent claims are probably those granted by Governor Kekū`anao`a. Not all claimants told how long they had occupied the land but of those who do they refer primarily to the ruling chiefs and then some refer to the local *konohiki*.

Many Kailua claimants list kings, queens, *kuhina nui* or governors to provide a time frame for when they received their land. The earliest such reference appears to be Kaloli, the wife of Kalaniopu`u who lived from 1752 to 1782 (Kuykendall 1980, vol I:30-32), followed by Kamehameha I, *Mo`i or king and conqueror of O`ahu in 1795* (p.87), Liholiho, King Kamehameha II in the 1820s, Kaomi, the Tahitian companion of Kamehameha III who died in 1833 (p. 135), Boki, governor in 1820s and his wife Liliha, *kuhina nui* - after 1829 and during the 1830s, Kīna`u, Queen from 1832-1839, Ka`ahumanu, Queen and *kuhina nui* in 1820s and Kekū`anao`a, the governor of O`ahu in the 1830s and 40's (p. 286), Paki, a high chief during the same period (p. 285), and Kamehameha III during the early 1840s. Some claimants give specific dates and these range from 1828-1848. Thus, the people established in Kailua by 1848-1853 only ascribe their roots to the land for the period of the 60-70 years before the Land Commission Awards. While some claimant's lands may have been in their family for longer periods, it would not have been politic in the land commission claims for land offered to them by Kamehameha III to refer to rulers prior to the Kamehameha dynasty.

At the time of the Māhele, it would appear that Kailua, Kāne`ohe and Waimānalo were considered choice locations for these *Ahupua`a* were awarded to the Crown, the royal family, and then to important *ali`i*, particularly warrior chiefs for Kamehameha I. The entire *Ahupua`a* of Kailua was awarded to Queen Kalama. Within the *Ahupua`a* the Crown took for itself the *`ili* of Kawailoa which surrounds the Olomana peaks, with a portion in Maunawili Valley and the major portion descending to the sand barrier and yet another detached portion of this *`ili* is found along the shoreline. Kawailoa encompasses the current project area. Princess Victoria Kamāmalu was awarded the *`ili* of Ka`elepulu which has both a down land and upland portion.

At the time of the Māhele land claimants testified before the Land Commission. This testimony provides valuable information in terms of land use circa 1850 and before. The LCAs records for Kailua document a thriving area of garden areas clustered along its 18± permanent and intermittent streams. The Maunawili/Kahana`iki Stream delta is a large, marshy low-lying area with no more than a 6% slope, with fertile soils along stream beds with many taro *lo`i*. Kapa`a Valley is narrow but also had many gardens along its stream. Other fertile areas are on the *mauka* side of Ka`elepulu Pond (modern fill now surrounds most of the former pond) going toward Waimānalo; and several very fertile areas are found within the present-day MidPac Country Club. The two great lagoonal fish ponds

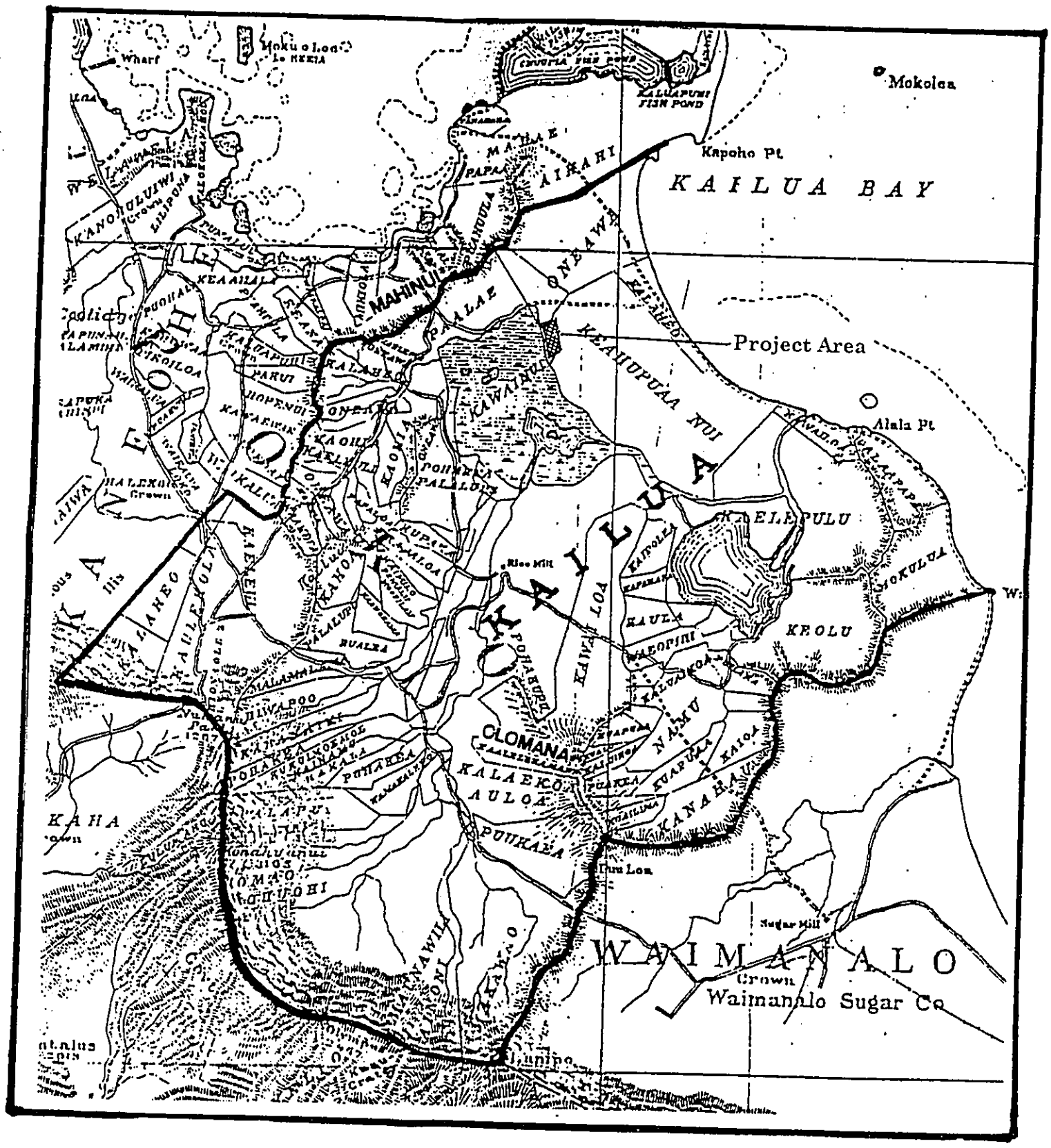

Figure 2 Map Showing the *`ili* Land Divisions of Kailua *Ahupua`a*, From John M. Donn, 1902, Hawai`i Terr. Survey

joined underneath the lookout point of Pu`u o Ehu and a few LCAs are found nearby. Another area between Keolu Hills, just to the southeast of the Pond/Lake, which shows fertile soils but does not have recorded Hawaiian farming there. This isn't to say that farming wasn't taking place there, merely that we have no record of it. A very narrow fertile area sits on the Pohakupu upland about the location of Kailua High School. These fertile soil areas are the location of most of the awards in the LCAS Native Register, Foreign Testimony and Native Testimony.

`Ili* are the land divisions within the *Ahupua`a and these were governed by the lesser chiefs and *konohiki*. The *`ili* of Kailua are shown in Figure 2, a portion of a map prepared by John Donn in 1902. Land divisions came about supposedly under the reign of Ma'ilikūkahi (born about 1360 A.D.), one of the chiefs who spent time in Kailua. There were approximately 70-80 *`ili* exploited in Kailua at the time of the Māhele. The current project area under investigation is in the *`ili* of `Oneawa, which had a few parcels of land awarded by the Land Commission, however none of which fall within the boundaries of the project area.

A majority of the *`ili* in Kailua, O`ahu were divided up among 41 of Kamehameha III's high chiefs. Others (39 *konohiki* awards) received *`ili* or partial *`ili* from Kamehameha III (13 or 20% of the 60 *ali`i* granted land in Kailua). These 39 are given 38 *`ili* (two each get a half of Pohakupu). Thirteen of the 60 high chiefs and *ali`i* retained the majority of the 70-80 *`ili*. At least two of the descendants of these chiefs still live on their land in Kailua; the descendants of Kuke (Tute) and the descendants of Peleleu. In addition to the names of those persons applying for a claim, we have witnesses' names and names of neighbors. Field boundaries are described by naming the neighboring cultivators, and many of these names did not appear on the LCAS list. Some claimants mention where they are cultivating under the aegis of another. In all, there are about 251 names given in the Native Register, Foreign and Native Testimony in the claims dealing with the Kailua, O`ahu area. Of these 251, 200 persons are mentioned tilling the land in Kailua Ko`olaupoko in some way. About 65% of those working the land actually applied for an award.

In the Māhele records, 123 house lots are mentioned in the awards. This, probably does not offer a true reflection of habitations, as the majority of 171 claimants probably lived within the *Ahupua`a*. Where "kauhale" or homes are mentioned the location of these house lots is typically bounded "on all sides by upland." However, although they were close to the fields, they had to be out of the wetlands. There are several house lots in the vicinity of the current project area, on other parts of the *`ili*

Ali`i* in Kailua don't specify what use they are making of their land in the LCAs. Most land use information comes from the LCAs (*kuleana*) belonging to commoners. In Kailua most claims include taro patches. All the many upper and lower valley streams are lined with taro *lo`i. Upper valley springs also have their taro patches. Some 1255± taro lo`i are listed in the LCAs. (Where Native Register and Foreign Testimony differ, the smaller number was used for conservative estimation, (cf Kelly 1981:27)). Kelly researched both the *`ili* of Olohana and Kumu and found no boundaries ever defined, the LCAs listed there all claimed taro *lo`i*. Although we don't have information on the size of the taro patches, we know that there were 1255 taro *lo`i* being tilled by some 200 claimants at the time of the Māhele in Kailua, O`ahu.

Kailua LCAs list other crops: *malas* of *wauke* or tapa fields, bananas, sugarcane, `awa, sweet potatoes and gourd fields; coconut, hala, kukui, koa, and fruit trees and one in Kukanono mentions cotton growing. An upland *`ili* is named for a koa pit, which would indicate that at some time in the past, koa existed in the area. Other woods mentioned in the *`ili* names are noni (`Ainoni - "to eat noni"), koa (Kālaikoa - "to hew koa"), `ohia (Ka`ohia), kukui (Kukuimoemoe - kukui and sleep or ambush), and kamani (Kalelekamani - "where the kamani trees sway."). Wauke (paper mulberry), Melons and potatoes, potatoes or sweet potatoes and *`awa* are some crops mentioned in the LCAs. Four *`ili* in Kailua have names associated with tapa/kapa. Kapaloa (long kapa), (LCAs 2464, 8799 mention a *mo'o* or *kula* without specifying what kind of cultivation) Kapa`ele (dark kapa), Kapalai (silent kapa), Kapalepo (dirty kapa). There are many *mo`o* (garden plots) mentioned in the LCAS testimonies with no crop designated. According to local farmers (Rocky Mikami, pers. comm.) the small piles of rocks in rows that one encounters on hillsides in Kailua are a sign of sweet potato patches and because sweet potatoes were a staple of the Hawaiian diet, it would make sense that these *mo`o* where crops are unspecified were mostly being used to grow sweet potatoes.

No mention of livestock shows up in the claims, but presumably there was some. Mention is made of numerous fisheries and pools where fish would have been raised. Early 20th century testimony (S. Mahoe) indicates that the fishermen at the shore traded ocean fish for taro with the upland farmers and this is probably a long-established pattern.

F. Ranching

In the early 1900s Kāne`ohe Ranch comes to dominate land holdings in the Kailua and Kāne`ohe area. Included within this acreage is much ranch land which has been bought, sold, let and used as ranch land by numerous parties since the mid-1850s. Kelly and Nakamura's history (1981:34-35) mentions that Government land sales amounting to 3,000 acres were sold to 21 buyers in Kailua between the years 1849 and 1863. The largest parcel went to William Jarrett of the *`ili* of Maunawili in 1849. The second largest was 399.5 acres to T. Cummins in Mokulua. Both parcels were used for ranching. Other land holdings which were turned into ranch land in the mid-1850s included the *`ili* of Mōkapu and `Oneawa (the location of the current project area) (by William Sumner and J. I. Dowsett) and the *`ili* of Puanea and `Ohua`uli (by the son of Paula Marin, Paul F. Manini). These large land holdings were used for years as ranch lands before becoming part of the Castle's Kāne`ohe Ranch. Cattle, sheep, and horses, were thus allowed to roam at will through may parts of Kailua, and would have destroyed many gardens and abandoned habitation areas. Kelly and Nakamura point out that although specific records are not available, based on tax information, it is not unreasonable to estimate that several thousand head of cattle were grazing in Kailua by 1875 (1981:69).

Kāne`ohe Ranch (Castle Trust) eventually acquired much of the land in Kailua (Hall 1997:84). Kāne`ohe Ranch, in addition to ranching, grew pineapple and sugar cane. The With the decline of rice farming around the margins of Kawainui, cattle stock move onto the abandoned agricultural lands. Ranching in Kailua continues to this day, albeit on a drastically reduced scale.

G. Growth of Cash Crops in Kailua

For the nearly 100 years following the *Māhele*, Kailua grew into an important area of commercial agriculture. Until the early 1900s, rice was the major crop. Rice was followed by truck farming of taro and Western crops. The truck farming gave way to surburbanization, as Kailua became the premier bedroom community for growing Honolulu.

The Reciprocity Treaty between the United States and the Kingdom of Hawaii allowed for the duty free exportation of Hawaiian sugar to the U. S. This 1876 treaty greatly fanned the flame of the already smoldering Hawaiian export sugar industry. The duty free export of rice was also covered under the treaty, however, it was the growing Asian population, first Chinese and later Japanese, brought to Hawaii to supply labor to the escalating export sugar industry, that provided the main impetus for the expansion of rice growing. With local consumption steadily growing, and duty-free export, rice growing in Hawaii had a boom period of its own.

Unlike the adjacent *Ahupua`a* of Ko`olaupoko, Kailua's main cash crop became rice rather than sugar. Kailua's numerous abandoned taro *lo`i* in the former taro lands of Maunawili and Kawainui provided perfect areas for the expansion of rice. At one time there were multiple rice mills functioning in Kailua *Ahupua`a*. By the first part of the 20th century, rice growers in California were using more modern production methods to reduce their costs. This lead to the rapid decline in rice farming in Hawaii (Kelly and Nakamura 1981:51-63).

Sugar never became an important crop in Kailua itself, but the need for water for the adjacent sugar lands of Waimānalo was an important factor in the transformation of the Kailua water shed. Following the 1876 Reciprocity Treaty the adjacent *Ahupua`a* of Waimānalo became the site of rapid sugar development, what became the extensive Waimānalo Sugar Company's fields. The development of these fields relied upon water from Kailua. As early as the late 1870's a system of flumes, ditches, and tunnels were built in the *mauka* portions of adjacent Maunawili to collect water from the abundant springs and streams. By 1881 close to 1,000 acres of sugar had been planted and milling operations were underway in Waimānalo (Kelly and Nakamura 1981:76). Expansion in acreage continued, increasing the need for water. By the 1920s improvements to the Waimānalo Irrigation System included catchment tunnels that were excavated into the base of the Ko`olau in Maunawili to increase flow.

Also, completed in 1923, was a system of pumps, pipelines, tunnels, and ditches, that conducted water from Kawainui Marsh into the Kailua ditch, a portion of the Waimānalo Irrigation System. This system continued to supply Kawainui water to Waimānalo until the early 1950s (Harland, Bartholomew, and Associates 1959:53-54; Hall 1997:94; Kelly and Nakamura 1981:778-79;). According to Wilcox (1996:111) two pumps lifted water from Kawainui and took it to the head of a 10,000-foot system of small tunnels, most through stone or hard earth, into a reservoir in Waimānalo.

In 1909 the Hawaiian Copra Company is established on the sandy area that is today bounded by Kalaheo and Oneawa Streets. Over 130 thousand trees were planted in an operation that involved leveling "the sand dunes and smooth[ing] out the sand hillocks" (*Honolulu Star Bulletin*, Sept. 12, 1931 cited in Kelly and Nakamura 1981:100; Hall 1997:77-78). The name Coconut Grove stuck, referring to most of the sand barrier area of

Kailua. Clearly this leveling and smoothing of former dune areas had a great impact on the archaeological record of this area of Kailua, and the project area under investigation.

The most prominent inroad made by sugar agriculture in Kailua was the establishment of the Hawaiian Sugar Planter's Association's field laboratory in 1926. It was established in former rice fields in stream bottoms, near present day Kailua Town. By 1946 the laboratory was in the process of moving further *mauka* into Maunawili (Kelly and Nakamura 1981:100).

By the 1950s, the truck farms that had flourished since the turn of the century within the bounds of present day Kailua Town, are slowly replaced by housing, municipal, and retail developments. Kailua is promoted as the bedroom community for Honolulu businessmen, only "8 miles and 20 minutes" from Downtown. Residential developments are planned for more outlying areas of Kailua Town, such as Olomana, Pohakupu, and Oneawa Hills (Hall 1997:141).

H. Kawainui Flood Control

As Chamberlain's early account, quoted above, shows, Kailua has historically been susceptible to flooding. From 1902 to 1940, Kawainui Marsh was hit with numerous heavy rainfalls resulting in major alluvial run-off. The Kawainui Marsh area became the target for federal flood control projects in the 1930's and a report was authorized by the Flood Control Act of August 11, 1939 (Wheeler 1949: 3; Kelly and Nakamura 1981). Plans for this project initially called for a canal that was expected to provide for a discharge of water at the rate of 4,000 cubic feet per second and maintain control of the water levels in the marsh. The plan for the canal was drawn out on an aerial photograph in December of 1948 (figure 22 in Kelly and Nakamura 1981:87). In March of 1951 Kailua experienced a major flood, resulting from two days of continuous rain (Swain and Hexel 1971: 8), where Kawainui overflowed and 250 people were forced to be evacuated. The flood extended from Noela Place to Uluniu St. (Brady 1959:10), covering the current Kawainui Marsh Park parcel.

As a result of this flood, the Territory of Hawai'i implemented its "pilot channel" project, where in 1952 the `Oneawa canal, which extended from Kawainui marsh to Kailua Bay, was built. Part of this pilot canal project was the "inner canal, that ran perpendicular to `Oneawa, which was expected to carry the water away from the marsh and prevent flooding of adjacent residences (See Figure 1). Both the "inner canal" and the larger `Oneawa canal are directly adjacent to the current project area. The excavation and dredging associated with the construction of these two drainage channels would have directly affected the current project area.

The completion of the `Oneawa Canal (1952) led the Kailua community to believe they were safe from flooding, however this was not the case. In March of 1958, heavy rainstorms again flooded Kailua, forcing the Army engineers to admit publically that "the present Kawainui Canal system would not be able to handle such a downpour..." (Brady 1959: 10).

A study published in 1971 (Swain and Huxel 1971: 18) revealed that the shallow water table beneath the frequently flooded areas and the lack of drainage was the primary reasons responsible for continued flooding in the low land areas and the project area under investigation.

III. PREVIOUS ARCHAEOLOGY

Twentieth century archaeological findings from inventory surveys, data recovery projects, and inadvertent finds during development are the main source of our knowledge about the archeological record in Kailua. Archaeological work in the last twenty years in Kailua has been fairly extensive. This work has been concentrated along the margins of Kawainui Marsh and within Maunawili Valley for the most part. This is largely due to the fact that most of the *makai* portions of the *Ahupua`a* had been developed prior to the implementation of State and Federal Historic Preservation Rules (Dye 1992). The many archaeological reports dealing with Kailua are listed and briefly summarized in Table 1.

The earliest habitation of the Kailua area is still under debate. A radiocarbon date obtained from a charcoal enriched soil layer has been interpreted as evidence that human habitation of Kailua began somewhere in the neighborhood of 350-650 A. D. (Clarke 1980: 32-33, 77-78). This date is not universally accepted, however, it is fairly well agreed among the archaeological community that by approximately 1200-1300 A. D. dramatic changes in the pollen record are indicative of the expansion of agriculture in the Kailua area, most likely in the well-watered margins of Kawainui Marsh (Hammatt *et al.* 1990; Athens and Ward 1991). Human colonization of the region would clearly have had to precede this agricultural expansion, perhaps by many centuries. It is logical that Kailua, and other regions of Ko`olaupoko, with their abundant marine and terrestrial resources, would have been attractive to the initial Polynesian colonizers.

The work of Hammatt (*et al.* 1990) and Athens and Ward (1991), has largely discredited Kraft's (1980) earlier assertions that Kawainui Marsh was an open water embayment at the time of initial Polynesian colonization. Athens and Ward (1991) suggest the Kawainui Embayment was sealed off during the first millennium B. C. as the result of a drop in sea-level. They correlate the Kawainui event with similar events at the same time in Kahana Valley and Ft. Shafter Flats, O`ahu.

Remains of upland terraces show that taro has been grown extensively and intensively in Kailua since the 13th or 14th century, and possibly earlier (Allen 1981, Williams, Mills and Allen 1995). The work of Cordy (1977, 1978), Allen (1981, 1986-87), and Athens (1983a) all document the mix of irrigated and dryland agriculture that was carried out in Kailua during prehistory and continuing into the historic period. Dryland agriculture, including yams, gourds, and sweet potato, would have been carried out on slopes and on drier flat-lands. Modification to the landscape would have been variable, ranging from none at all to the construction of terraces and mounds for planting. According to Handy (1940:155) the beach barrier at Kailua (current day Coconut Grove) was famous for its production of sweet potatoes, grown in small mounds. Irrigated agriculture would have been carried out along streams and below springs. Associated landscape modifications would have included construction of terraces and/or pondfields, *`auwai*, and earthen and stacked-stone berms. These types of dryland and irrigated agricultural features have been found in Maunawili and along the margins of Kawainui Marsh.

Table 1. Previous Archaeological Reports *Ahupua`a* of Kailua, Ko`olaupoko, O`ahu

Reference	Location	Description and Results
Thrum, various 1907-1918.	Kailua *Ahupua`a*	In his articles for the *Hawaiian Almanac and Annual* (1907-1918) Thrum is the first to document many of the *heiau* in the *Ahupua`a* of Kailua.
McAllister 1933	Kailua *Ahupua`a*	McAllister's island-wide survey of the major archaeological sites of O`ahu supplies some of the first detailed descriptions, maps, and photographs of Kailua's archaeological remains. He describes 16 sites within Kailua *Ahupua`a*, including Kawainui pond (#370), Ka`elepulu fishpond (#377), Ulupo *heiau* (#371), and Pahukini *heiau* (#359). In all eight *heiau* are reported for Kailua.
Handy 1940	Kailua *Ahupua`a*	Handy's discussion of traditional Hawaiian agriculture gives regional descriptions of what crops were planted where within the Hawaiian chain. Kailua *Ahupua`a* is described as a rich, productive, well terraced taro growing area (p. 99). The "sandy plains" of Kailua were planted in sweet potato, using a planting system of small soil mounds (p. 155, plate 8)
Clark and Connolly 1977	Hāmākua Drive along Kaelepulu Stream.	This survey identified five stacked-stone alignments, a possible wall alignment, a potential habitation site, two agricultural sites, the remains of an irrigation ditch, and surface midden. A possible *heiau* was also recorded, however, when Hommon (1982) and Morgenstein (1982) revisited this project area, they found no remains of the possible *heiau* structure reported by Clark and Connolly.
Cordy 1977	Kawainui Marsh	Cordy, working for the U. S. Army Corps of Engineers, performed archaeological survey, historic document research, and aerial photograph analysis, for the alignment of a proposed City and County sewer-line along the south and southeastern margin of Kawainui Marsh. He documented historic house sites and both dryland and wetland agricultural features, including terraces.
Cordy 1978, Morgenstein 1977-	Kawainui Marsh	Agricultural features from Cordy's earlier identified "Site 7" (from Cordy 1977) were subjected to excavation to determine the chronology of land use. Previous examination of aerial photographs revealed extensive agricultural fields in this southern extension of Kawainui Marsh. Excavations revealed sequential land use of the area, from prehistoric irrigated taro agriculture, into historic irrigated taro agriculture, into later historic rice agriculture. Prehistoric agricultural features, such as terrace walls, were found buried below sediments, suggesting that they had not been substantially disturbed by later historic rice and livestock grazing activities in the area.
Dye 1979	Kapa`a Ridge	Reports the discovery, mapping and excavation of Bishop Museum site # 50-Oa-G6-31, a combination of terrace remnants and cobble paving, thought to be prehistoric agricultural remnants. The site is located just below the summit of Ulumawao Ridge, in a hanging valley of an intermittent stream. After the work was completed these features were destroyed by the expansion of the Ameron Quarry facility

Kraft 1980	Kawainui Marsh	John C. Kraft is a specialist in prehistoric and historic coastal land form changes. Based on his research, which included coring various spots around the marsh, Kawainui Marsh was a shallow marine embayment of the coastal reef tract, very similar to present day Kāne`ohe Bay. Between 6000 and 2800 years B. P., before the Kailua sand berm had formed, corals grew and marine foraminiferal sands and carbonate muds were deposited around the margins of the embayment. Only after 2800 B.P. did the sand berm begin to form, slowly closing off the embayment. Until 400 or 500 years B. P. both the north and south outlets of the embayment (`Oneawa and Ka`elepulu) remained open. Kraft suggested the possibility that formation of the sand berm could be related to human factors, such as the construction of stacked stone fish ponds within the embayment. According to Kraft's recreation, the terrigenous in filling of the margins of the embayment was a relatively recent development, in the last 400-500 years B. P., with most taking place in the last 200 years.
Allen-Wheeler 1981	Kawainui Marsh	Allen-Wheeler conducted excavations in the Marsh with results that confirmed and refined Krafts' (1980) sequence of Kawainui development from embayment to marsh. Terrestrial in-filling of the marsh began about 650 A.D. with the formation of a peat layer. By 1300 A. D. a layer of alluvial soil had been deposited--possibly the result of human agricultural activity within Maunawili. Rapid alluvial in-filling continued at a rapid rate until the present. Taro cultivation within the marsh could not have taken place until approximately 1200 A.D.
Morgenstein 1982; Hommon 1982	Hāmākua Drive adjacent to Ka`lepulu Stream	Morgenstein and Hommon report surface survey and subsurface testing conducted to assess the potential of archaeological features along the Ka`elepulu truck sewer line. The investigation documented layers of historic fill in the upper layers and the presence of one potential agricultural bund, thought to be associated with rice farming, below.
Neller 1982a	Kawainui, Kukanono area TMK 4-2-13:38	Neller reports the work he undertook in Kukanono as part of a field school on behave of the Sierra Club School Hikers Program and Hawaii Science Teachers Association. These limited subsurface investigations were carried out in the same area reported by Clark (1980) and Athens (1983a). Neller dismisses the early date reported by Clark (1980).
Neller 1982b-	Maunawili Valley TMK 4-2-09:1	This short letter report documents a field trip to investigate archaeological sites in the back of Maunawili Valley. The reported locations of McAllister's sites 373 (Halaualolo *Heiau*), 374 (Kukapoki *Heiau*), and 375 (house sites, were visited. The extensive agricultural terraces, abandoned *lo`i*, were noted along large portions of both Omao and Maunawili Streams.
Athens 1983a	Pohakupu Kukanono slope S.S. #50-80-11-2022	Working in much the same area documented by Clark (1980), these investigations consisted predominantly of surface collections and subsurface testing. Excavation revealed that the abundant surface features (primarily agricultural mounds and terraces) were built in the most recent soil layers after 1900 A. D. Only one small area of the project area contained undisturbed prehistoric deposits. An earth oven in this prehistoric deposit was dated to the 13th to 15th centuries A. D., calling into question the early dates (4th to 7th century A. D.) obtained by Clark on the same slope of Kawainui. Soil erosion on the Pohakupu-Kukanono slope was apparently intense during the prehistoric period and soil deposition and development was infrequent prior to construction of the historic terraces.

Athens 1983b	83 Kihipai Street, Kailua TMK 4-3-57:65	This report documents the 11 grid units excavated in site 50-Oa-G6-40, the H.A.R.C. site. The site consists of marine midden, and subsurface features including hearths and pits. Radiocarbon dates indicate occupation of the site sometime in the mid- 13th to early 15th century. Midden remains were analyzed and conclusions suggest a change through time in the exploitation pattern. Athens suggests the use of the Kailua accretion barrier for habitation may have started about the same time as the occupation of the site. This site was originally located and excavated by Wheeler (1981)-.
Toenjes and Donham 1986	Maunawili Valley	This reconnaissance for the City and County's Maunawili District Trunk Sewer was located along Maunawili Stream north (*makai*) of Maunawili Road to the southern extent of Kawainui Marsh and Kalaniana`ole Highway. One historic site, a ditch which once carried water from Maunawili Stream to a rice mill, and several potentially prehistoric terrace remnants were discovered within the project area. The authors report previously unreported archaeological features within the vicinity of the project area, associated with Maunawili Stream.
Brennan 1986	Maunawili Valley	This reconnaissance survey was done for Royal Hawaiian Country Club, Inc., for a parcel proposed for a golf course in MAUNAWILI. Brennan located and described 42 sites, some of which had been previously identified. Sites include historic features (a bath site), a *heiau* (which appears to match McAllister's site 374, "*Heiau* on the land of Kukapoki") prehistoric irrigated taro fields, habitations, walls, burials and stream embankments.
Allen 1986, 1987	Maunawili Valley	These mitigation and data recovery plans and preliminary reports detail the results of archaeological investigations at the site of the Royal Hawaiian Country Club, Inc. golf course. Sites investigated included historic habitations, charcoal kilns, roads and trails, and agricultural sites. The final report for these investigations is forthcoming
Shun, Price-Beggerly, and Athens 1987	Kailua *mauka*, west of the Pali Golf Course	This inventory survey of approximately 200 acres, the site of a proposed golf course, revealed that the area was not used extensively by traditional Hawaiians for habitation, agriculture, or other activites. Historic document research revealed that Pineapple agriculture (c. 1912) and truck farming, in the 1920s, were some of the greatest land uses of the parcels. Sites found included a small terrace complex, two charcoal kilns or seepage wells, a habitation complex, and a rock wall.
Williams 1988	Maunawili	This reconnaissance survey took place to investigate the proposed new location for the displaced Luluku farmers (by H-3 development). 13 sites were recorded in this *mauka* portion of Maunawili (540'-920' elevation), including probable historic charcoal kilns and agricultural complexes.
Szabian 1989	Foot of Mount Olomana	During this archaeological reconnaissance survey of the proposed site of the Women's Community Correctional Complex (adjacent to Maunawill Elem. School) no new surface or subsurface archaeological sites of deposits were discovered. The authors did remap the remains of Kukuipilau *Heiau* (State Site # 50-80-11-372), which was first reported by Thrum and McAllister (site # 372), and re-discovered by Neller. They also note the freshwater spring "Kawailoa freshwater spring" adjacent to the *heiau* .

Hammatt, *et al.* 1990	Kawainui Marsh	The sediments from sediment cores from 10 locations in the Marsh were analyzed to characterize their "depth, age, and nature". Conclusions: Kawainui was marine bay with open circulation and tidal activity for most of the Holocene. Around the end of the first millennium B. C., in a relatively sudden geological event, the bay was partially blocked by a sand barrier, becoming a lagoon of mixed fresh and saline waters. This change is marked by a 600% increase in sedimentation rates on within the Kawainui basin. The lagoon persisted until as late as 570 A. D. By 1400 A. D. the lagoons outlet to the sea was closed and the Kawainui basin, already largely filled with terrestrial silty clays developed its wetland appears of today. Pollen samples which bracket the periods from bay to marsh show no apparent changes resulting from early Polynesian settlement. At approximately 1400 A. D. there are dramatic changes showing voluminous drops in mixed mesic forest species and an increase in grasses and sedge. These changes may well be the result of increases in Hawaiian subsistence activities.
Quebral, Orndoff, and Athens 1991	Hāmākua Drive and Pu`u o Ehu Ridge	Four most likely historic sites were locate during this inventory survey along the margins of Ka`elepulu Stream, in an area that has seen modern in filling. Although background research indicated the importance of the project area for traditional agriculture, no specific indication of traditional Hawaiian land use was found. The project area was used for historic rice cultivation and livestock grazing.
Athens and Ward 1991	Kawainui Marsh	Thirty-seven core/auger units were dug along the eastern margin of Kawainui Marsh, in the vicinity of the drainage control levee. Conclusions: The marsh basin was transformed into a relatively closed, freshwater system at about 200 B. C. Data from other locations on O`ahu (Ft. Shafter Flats and Kahana Valley) support the conclusion that the transformation was due to regional causes, namely a fall in mean sea-level, rather than local forces, as had previously been proposed. The Kailua sand berm begins to form between 600 and 1000 B. C. Until approximately 1000 A. D., the Kailua lowlands were dominated by *Pritchardia*-palm forest. After 1000 A. D. these forests decline rapidly. The vegetation transformation is attributed to rising human population levels and the expansion of agriculture. Counts for cheno-am type and grass pollen rise dramatically after approximately 1200 A. D. These pollen types are indicators of disturbed environments and are thought to be indicators of the expansion of agriculture. Based on increases in sedge pollen after about 1000 A. D., it appears that Kawainui basin was too deep to support a marsh community, exept along its margins, until this time.
Hammatt and Shideler 1991	Maunawili	This inventory survey for the Na Ala Hele Trail Corridor through the *mauka* portion of Maunawili Valley found seven sites. Sites included the Old Pali Road, two probable historic charcoal kilns, and a large agricultural complex. It was unclear if any of the sites were prehistoric.
Hammatt, Pfeffer and Creed 1993	Pu`u o Ehu Ridge TMK 4-2-03:46	This inventory survey for the proposed location of the Kailua 272 Reservoir found no historic properties. Oral history research did reveal the traditional Hawaiian significance of Pu`u o Ehu peak as a spot overlooking the waterway that joined Ka`elepulu and Kawainui ponds.
Brennan 1994	Maunawili Valley	This short letter report, address to Dr. Tom Dye, SHPD, documents and explains significance evaluations for 8 newly recorded sites in Maunawili. These sites were found during monitoring for the Royal Hawaii Country Club Golf Coarse. Features include pondfields, firepits, trash dumps, a cemetery documented from oral history, habitations, slope retainers, terraces, and a possible military training bunker.

Hammatt, Creed and Masterson 1994	Maunawill Estates (TMK 4-2-63:31,38)	This reconnaissance survey of a 10 acre parcel revealed no historic properties.
Williams, Mills, and Allen 1995	Upper Maunawili Valley	Excavations at six sites within upper Maunawili Valley (the location of the Luluku Banana Farmers Relocation) are reported. These six predominantly prehistoric agricultural sites, based on radiocarbon dating results, were constructed between 1260 and 1650 A. D. These radiocarbon dates suggest that extensive agricultural and other cultural activities began in the valley by the 14th century, and possibly a few centuries earlier. No human burials or definite habitation areas were discovered in the six sites, but evidence for pre-Contact habitation was found at a previously unidentified site.
Hammatt and Chiogioji 1997	`Auloa Road	This reconnaissance assessment of a 0.8 mile section of `Auloa Road, immediately *makai* of Castle Junction, found no historic or archaeological sites, other than the previously recorded Kāne`ohe Ranch office building and the adjacent war memorial monument (State site 50-80-10-1360).
Hammatt and Medeiros 1999	Kailua Ahupua`a TMK 4-3-28:73	Inadvertent burial find of a single individual, represented by the remains of one bone fragment (radius or ulna) in situ. The lower skeletal remains were recovered by SHPD/DLNR staff, while the contents of the excavated sand was intensively screened and fragmented remains were recovered. The remains collected by the Burial Program staff included both femora, both fibulae, one tibia, both innominates, both humeri, proximal fragments of right ulna and radius, distal fragment of left ulna, mandible, sacrum, and a frontal fragments of the cranium.
Medeiros, Bush, and Hammatt 2000	Kailua Ahupua`a TMK 4-3-53:29	Inadvertently discovered burial of a single individual was partially recovered because of previous disturbance of this Kailua project area. A total of 5 human bones were recovered during the length of this project, including 1 adult skull (minus the mandible), 1 rib fragment, 1 carpal fragment, and two unidentified fragments. This represents less than 5% of the total remains. The remains collected appear to represent one individual. The ethnicity of the remains is not apparent, especially with the low percentage of the entire burial recovered. There was no evidence near the remains, or anywhere within the stratum containing the burial, to suggest ethnicity.

Previous archaeological investigations in Kailua have located dispersed prehistoric habitation remnants. This is in keeping with the observations of early Westerners in Hawaii that the settlement pattern for the most part was dispersed habitations scattered across the landscape amid agricultural fields. It should be remembered that settlement data is conspicuously absent from the lowland, beach berm areas of Kailua, due to early development of these areas.

McAllister (1933) reported eight *heiau* within the *Ahupua`a* of Kailua, and it is not unreasonable to conclude there were several more of which McAllister's informants had no knowledge. This is well in keeping with Kailua's status as a productive *Ahupua`a*, the residence of *Ali`i*. The two known *heiau* closest to the current project area are McAllister's site 371 Ulupo *Heiau* (located approximately half a mile northwest of the project area) and McAllister's site 372 Kukuipilau *Heiau* (located approximately a third of a mile southwest of the project area). Both of these *heiau* were reported to be agricultural in function.

In the last eleven years over 15 reports of inadvertent finds of human skeletal remains have been made in Kailua, on the sandy beach berm of Coconut Grove and Lanikai. As with other near shore sandy areas in Hawaii, clearly Kailua was used for burial of the dead. These burial remains are not nearly as extensive, however, as the hundreds of human burials discovered from nearby Mōkapu peninsula (Snow 1974).

Archaeological investigations that are more relevant to the current project area include excavations of beach midden deposits at the H. A. R. C site (50-Oa-G6-40) (Athens 1983b) which is located southeast of the current project area, along the same inner shoreline of Kawainui Marsh. The archaeological deposits mainly consists of marine midden, hearths, and pit features. Analyzed midden deposits revealed a change through time in exploitation pattern, as habitation continued for some time at the site. This however is the only pre-contact habitation site of its kind on the `Oneawa/Keahupua`a nui plain (other than burials) (Athens 1983b), as other sites were largely destroyed by urban and residential expansion into the area. The upper portion of the stratigraphy for this site, is comprised of fill (Layers I, II, and III) which contained abundant clay lumps mixed with loam, coralline rock, and sand fill. It is speculated that this might be a product of the Ka`elepulu dredging in the past years. For the most parts, the deposits were exactly what might be expected from a stream draining on the edge of a coastal barrier— clay and loam intermixed with sand and coral.

No archaeological projects have been conducted in the vicinity of the current project area along the northeast margin of Kawainui Marsh.

IV. BACKGROUND RESEARCH SUMMARY AND PREDICTIVE MODEL

The abundant historical and archaeological resources for the *ahupua`a* of Kailua are more than sufficient to reconstruct the land use and settlement pattern history of Kailua, from prehistoric times up until the present. From archaeological research we know that the margins of Kawainui Marsh and Maunawili Valley were the site of expanding agriculture by the 13th and 14th century A. D. This expansive agriculture is most likely the result of an expanding population, the descendants of original settlers from centuries earlier. That the area was productive is confirmed by oral traditions. Oral traditions also associate Kailua with numerous legendary rulers, implying that the area was important politically as well as agriculturally. The many *heiau* that dot the landscape further attest the productivity and political importance of Kailua. Settlement would have been dispersed, from the beach berm along the coast, up into Maunawili Valley. Agriculture would have been a combination of dryland, on the slopes and drier flat lands, and wetland along the margins of streams. Although we lack early historic population estimates from Kailua, it is reasonable that this productive area would have been well populated.

Western disease was responsible for drastic depopulation of the Hawaiian Islands in early historic times. The earliest accounts of Western visitors to Kailua document the depopulated appearance of the land and sickly native inhabitants of the region. Kailua's first census count, from the 1830s, of 760 individuals is apparently much reduced from pre-contact population figures--based on the number of recently abandoned agricultural terraces noted by visitors. This depopulation was a significant factor in the transformation of land use in Kailua, as abandoned land was transformed from traditional use to cash-crop production.

During the Māhele, Kailua's status as a highly desirable location is reaffirmed. Along with other Ko`olaupoko *Ahupua`a*, Kailua land is given to many chiefs. The current project area, as part of the *`ili* of `Oneawa, was not awarded by the Land Commission in the Māhele. Records show that approximately 170 land claims were made for agricultural and residential land in Kailua however. Kula land, taro *lo`i*, and house lots, were all most commonly claimed. No claims were made within the current project area, however.

Cattle grazing and rice growing became large scale commercial pursuits in Kailua following the Māhele. Abandoned taro lands were perfect for the expansion of rice, which was having its own boom period related to the 1876 Reciprocity Treaty with the United States. With the decline of rice farming in the early part of this century, truck farming become popular throughout much of Kailua. Again we have no specific references to land use within the current project area during this time. As a somewhat peripheral area, where the sandy dune deposits meet Kawainui marsh sediments, it is possible that it was used for taro or rice agriculture, or even cattle grazing in the later periods. By the 1950s, the suburbanization of Kailua, which began as early as the 1920s, is beginning to displace the truck farmers. This process continues into the present day and Kailua becomes the premier "bedroom community" for downtown Honolulu.

The current project area is located along the embankment of Kawainui Marsh. No traditional accounts or legends are ascribed to this section of land, although outside the project area, Kawainui itself, has been described to have had traditional-Hawaiian significance. Historical accounts make no mention of the use of this flat embankment.

Chamberlain's early historic account describes this portion of Kailua as low and flooded. The periodic flooding of this area continued through the later historic period into the present day. The flooding undoubtedly occurred with the same frequency in the prehistoric era. With this recurrent flooding it is less likely that this area was chosen for permanent habitation. The agricultural use of the area, located along the margin of the marsh, is a possibility.

During the Māhele, the project area was not among any of the lands awarded by the Land Commission within the *`ili* of `Oneawa. There are LCAS's claimed in the vicinity of the project area, but none within the property boundaries itself. Also, traditional land boundary maps (W.A. Wall 1899 Map of Kailua) indicate that there were several house sites in the area, none of which however were on the proposed area. The adjacent *`ili* of Keahupua`a nui was received in its entirety in the Māhele by Queen Kalama, as well as the fish pond of Kawainui itself (shown on maps as part of portion 12 of LCA 4452).

The modern constructions of the Kawainui drainage features, the `Oneawa Canal and the Kaelepulu "inner" Canal, had a distinct impact on the land form of the project area. The excavation and dredging associated with the installation of these large drainage features resulted in the deposition of sediments on the former low lying project area.

Based on background research, it is unlikely that remnants of traditional Hawaiian activities will be encountered within the project area. The landscape has already undergone alteration and disturbance, with the 1909 Copra project leveling the plain to plant coconut trees, and later in 1952 the flood control channel project, dissecting the property. The only possibilities include subsurface remnants of agriculture, such as terraces or mounds, but, again, this is unlikely. If sand is encountered in the sub-surface testing, we can expect to find similar cultural deposits as previous excavations in the Kawainui Marsh interior shore. The probability of this occurring is highly unlikely however when taking into the account the land history of this area for the past 50 years.

V. SURVEY RESULTS

A. Summary of Trenches

Eight backhoe trenches were excavated on the current project parcel. Figure 3 shows the location of these trenches. A combined length of 28.25 meters were excavated with a 70 cm wide backhoe bucket. Based on the predictive model, trench excavations were placed to take the most representative sample of the project area, and to expose remnants of the ground features that could have possibly appeared: wetland/dryland agricultural features and possibly mounds. The sediments and sub-surface features found are similar to the expectations of the predictive model. There was no evidence of historic properties along this margin of Kawainui. The depth of the water table in each of the trenches ranged from 1.34 m. to 2.5 meters. No human burials were encountered.

B. Stratigraphy Overview

Evident in the exposed stratigraphy were three major stratigraphic components: the upper section, usually layers of Strata I - III, are recent land fill sediments which date to post 1940; the second stratigraphic component, Strata IV is comprised of a mixture of marine dredge, with coral and limestone cobbles. Finally, the third exposed stratigraphic component is the original natural marine sand deposit which comprise Strata V - VI. The only cultural materials found, other than the debris (plastic, asphalt, gravels, bottle glass, PVC pipe fragments, brick, rusted metal, concrete) in the upper recent fills, were fragments of a terra-cotta pipe and milk bottle from Wai`alae nui.

The recent fill layers, those in the uppermost strata, vary in texture and color. The deeper deposits—those most likely related to the natural marine activity and alluvial processes—were more consistent in texture, color. Generally, stratigraphy was fairly consistent throughout the project area. The following is a more in-depth description of the major stratigraphic components. The uppermost sediments, as mentioned above, are generally comprised of recent fills that include: recent landscape fill, recent construction fill, and re-worked refill materials. These materials are representative of construction, and urbanization of Kailua from the late 1940s to the present. The construction of flood control channels and more recent housing developments account for part of the diversity in these upper sediments. (See Figures 14 and 15 of the Photographic Appendix).

These recent fills include sediments of fine to coarse sand or loam that vary in Munsell color from very pale brown to dark grey. Inclusions recorded include roots and rootlets, decomposing weeds, gravel to cobble size rubble comprised of coral, shell, and basalt. Historic infrastructure debris includes asphalt fragments and layers, cement fragments, metal wire, PVC pipe fragments, and plastic fragments. Architectural rubbish such as glass and brick fragments were sometimes mixed within the refill materials.

These fill sediments consists of fine to medium- silty sand, sandy loams, and loamy sands. Fine clay lenses are present in some of the predominately sand strata. Strata IV, which is also a fill, contains gravelly to stony coral inclusions from possible dredging activity when building the flood control canal.

20'

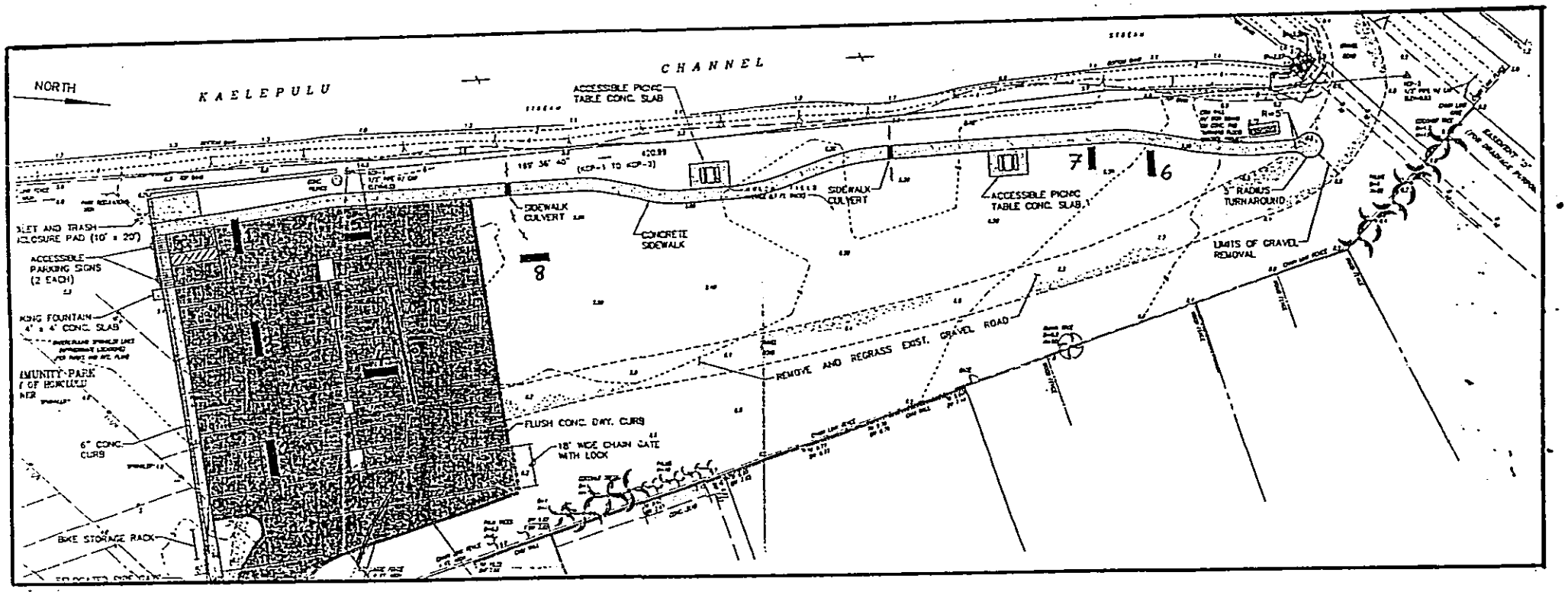

Figure 3 Map Showing the Project Area and the Locations of the 8 Backhoe Test Trenches.

Munsell colors for these fills vary from yellowish brown to various shades of browns and grays. In general, the top layers are inconsistent and can range from pale brown to dark gray silty sands, sandy loam, and loamy sand. The mid-layers are yellowish to brown gravelly loams and sands; and the lowest layers are a variation of gray to dark gray sand and sandy loam.

This gray sand is generally found at or near the water table, sometimes extending below. These sands are structureless with no apparent inclusions. The deepest exposed, sandy deposits are thought to be the natural land surface prior to the deposition of the higher fill layers. These lowest natural layers confirm the conclusions of the background research--that prior to modern land alterations associated with the construction of the Kawainui drainage features, this portion of Kailua was low lying area that was prone to flooding. It is this low lying landscape that matches the descriptions of Chamberlain.

The following is a detailed description of the stratigraphic components of each trench:

C. Trench Descriptions and Profiles

Location, dimensions, and general trench observations are described below, followed by a general strata interpretation, and particular observations. Trench profiles, sediment descriptions, and profile photographs end each trench section.

Trench 1
Length: 5.2 m
Width: 0.7 m
Depth: 1.92 m
Orientation: 72/252 degrees TN
Depth of water table: 1.92 m
(See Figure 14--Photographic Appendix)

Stratum Ia: 10YR 5/3 brown; loose; silty sand (calcareous); strong, fine to medium, blocky structure; contains organic material including roots and rootlets, decomposing grass and weeds, coral gravels, modern bottle glass, rusted metal, aluminum, land snail shell fragments; LB = abrupt/smooth; modern A-horizon.

Stratum Ib: 10YR 5/2 grayish brown; slightly compact; silty sand (calcareous); weak, fine, blocky structure; contains general modern rubbish similar to stratum Ia--abundant roots and rootlets, large diameter red terra-cotta pipe fragments, plastics, asphalt fragments, metal wire, small amount of land snail shell fragments; LB = abrupt/smooth; modern fill layer.

Stratum II: 7.5YR 4/3 brown; compact; sandy loam; strong, fine, blocky structure; contains abundant basalt gravels and cobbles; whole modern milk bottle (Waialae nui), concrete fragments, modern rubbish including plastics and an Olympia pull-tab beer can; a few very fine rootlets; LB = abrupt/smooth; modern fill layer.

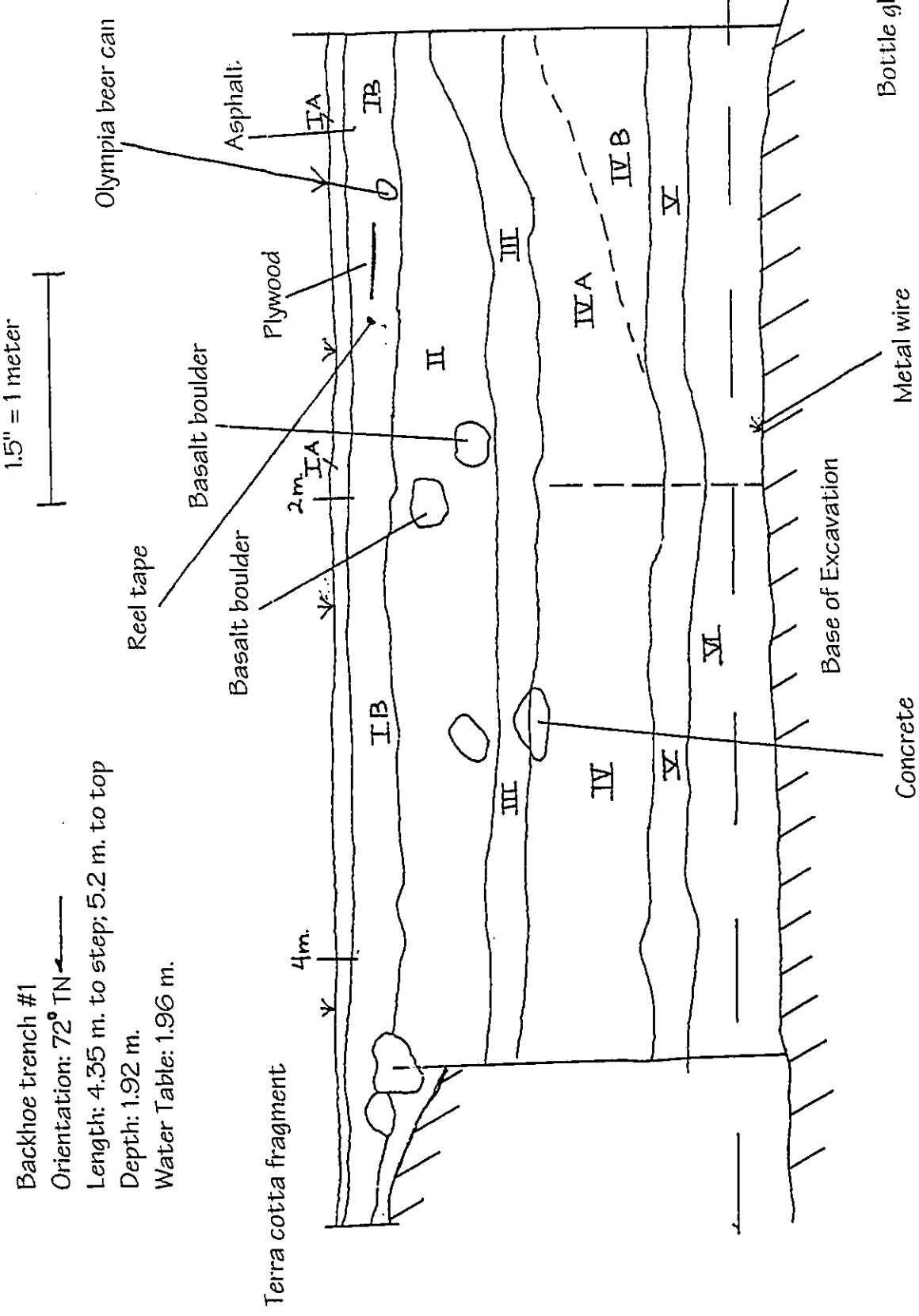

Figure 4 Profile of Backhoe Trench 1

Stratum III: 10YR 7/3 very pale brown; loose; fine to medium sand (calcareous); structureless; contains asphalt and concrete fragments, limestone and basalt gravels, small water-worn marine shell fragments; LB = abrupt/smooth, modern fill layer.

Stratum IVa: 10YR 3/4 dark yellowish brown; compact; gravelly loam; structureless; contains few roots and rootlets, coral and limestone cobbles and gravels; LB = abrupt/smooth; modern marine dredge fill layer.

Stratum IVb: Mix of Strata IVa and V, the two sediments mottled together; LB = abrupt/smooth; modern fill layer.

Stratum V: 10YR 4/1 dark gray (moist); slightly compact; sandy loam; structureless; no apparent inclusions, although appears to be enriched with decomposed organic material; LB = abrupt/smooth; natural sediment deposited in a low energy aquatic environment.

Stratum VI: 10YR 5/1 gray (wet); loose; medium to coarse sand (calcareous); structureless; no apparent inclusions; natural marine sand deposit.

Trench 2

Length: 3.4 m
Width: 0.7 m
Depth: 1.49 m
Orientation: 74/254 degrees TN
Depth of water table: 1.34 m

Stratum I: 10YR 5/2 grayish brown; slightly compact; silty sand; weak, fine, blocky structure; contains general modern rubbish--abundant roots and rootlets, plastics, asphalt fragments, metal wire; LB = abrupt/smooth; modern fill layer.

Stratum II: 7.5YR 4/3 brown; compact; sandy loam; strong, fine, blocky structure; contains abundant basalt gravels and cobbles, concrete fragments, modern rubbish including plastics; LB = abrupt/smooth; modern fill layer.

Stratum III: 10YR 7/3 very pale brown; loose; fine to medium sand (calcareous); structureless; contains asphalt and concrete fragments, limestone and basalt gravels, small water-worn marine shell fragments; LB = abrupt/smooth, modern fill layer.

Stratum IV: 10YR 3/4 dark yellowish brown; compact; gravelly loam; structureless; contains few roots and rootlets, coral and limestone cobbles and gravels; LB = abrupt/smooth; modern marine dredge fill layer.

Backhoe Trench #2
Orientation: 74° TN
Length: 3.36 m.
Width: 0.70 m.
Depth: 1.49 m.
Water Table: 1.34 m.

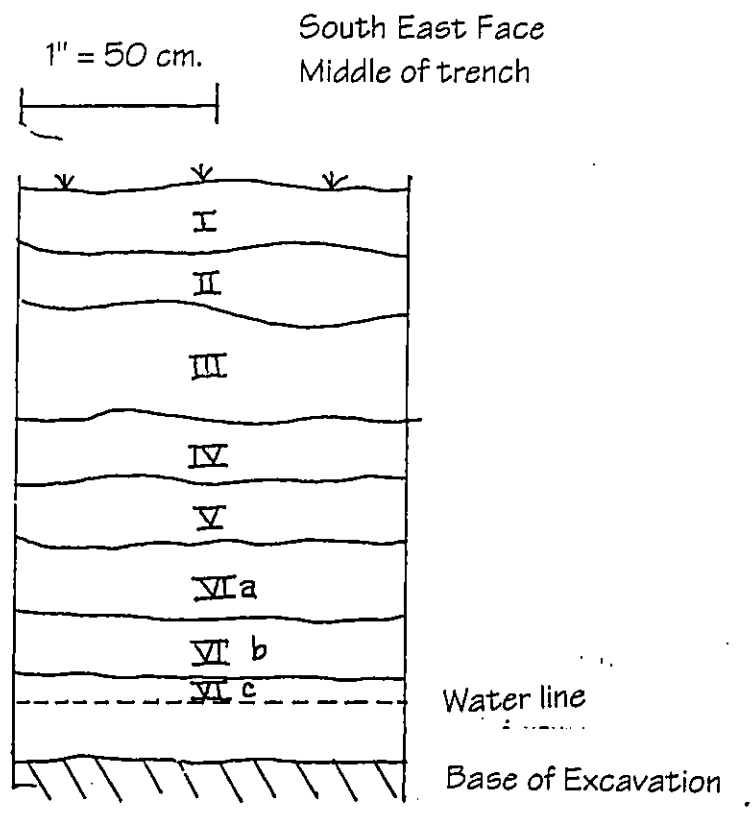

Figure 5 Profile of Backhoe Trench 2

Stratum V: 10YR 6/4 light yellowish brown; compact; gravelly, loamy sand (calcareous); structureless; contains abundant limestone gravels and cobbles; LB = abrupt/smooth; modern fill layer.

Stratum VIa: 10YR 3/1 very dark gray (wet); loose; loamy sand (medium to coarse grained- - calcareous); structureless; no apparent inclusions, although appears to be enriched with decomposed organic material; natural, organically enriched marine sand deposit. This sediment is marbled with intermittent deposits of black (10YR 2/1) slightly compact, structureless clay loam.

Stratum VIb: 10YR 3/1 gray (wet); loose; coarse sand (calcareous); structureless; no apparent inclusions; natural marine sand deposit.

Stratum VIc: 10YR 5/1 gray (wet); loose; silty sandy loam; structureless; no apparent inclusions; natural deposit.

Trench 3
Length: 3.25 m
Width: 0.7 m
Depth: 1.73 m
Orientation: 72/252 degrees TN
Depth of water table: 1.45

Strata I-VII: This mix of fill layers was clearly modern and consisted of relatively thin (10-15 cm thick) layers of interbedded calcareous sands and terrigenous loams. Stratum V consists of basalt construction gravel. These sediments contain gravels, modern rubbish including bottle glass, PVC pipe fragments, brick fragments, rusted metal, and concrete fragments.

StratumVIII: 10YR 7/3 very pale brown; loose; fine to medium sand (calcareous); structureless; contains asphalt and concrete fragments, limestone and basalt gravel; LB = abrupt/smooth, modern fill layer.

Stratum IX: This layer consists of decomposing wood--branches and twigs mixed with some milled lumber. Some plastic and rusted metal were mixed with the wood. This is a modern fill layer.

Stratum X: 10YR 3/4 dark yellowish brown with mottles of 10 YR 4/1 dark gray and 10 YR 5/1 gray; compact; gravelly sandy loam; structureless; contains few roots or rootlets and coral cobbles and gravels; LB = abrupt/smooth; this layer is a mix of Strata IVa, V, and VI from trench 1.

Stratum XI: 10YR 4/1 dark gray (moist); slightly compact; sandy loam; structureless; no apparent inclusions, although appears to be enriched with decomposed organic material; LB = abrupt/smooth; natural sediment deposited in a low energy aquatic environment.

Stratum XII: 10YR 5/1 gray (wet); loose; medium to coarse sand (calcareous); structureless; no apparent inclusions; natural marine sand deposit.

Backhoe Trench #3
Orientation: 72° TN
Length: 3.25 m.
Width: 0.67 m.
Depth: 1.73 m.
Water Table: 1.45 m.

2" = 1 meter

South East Face

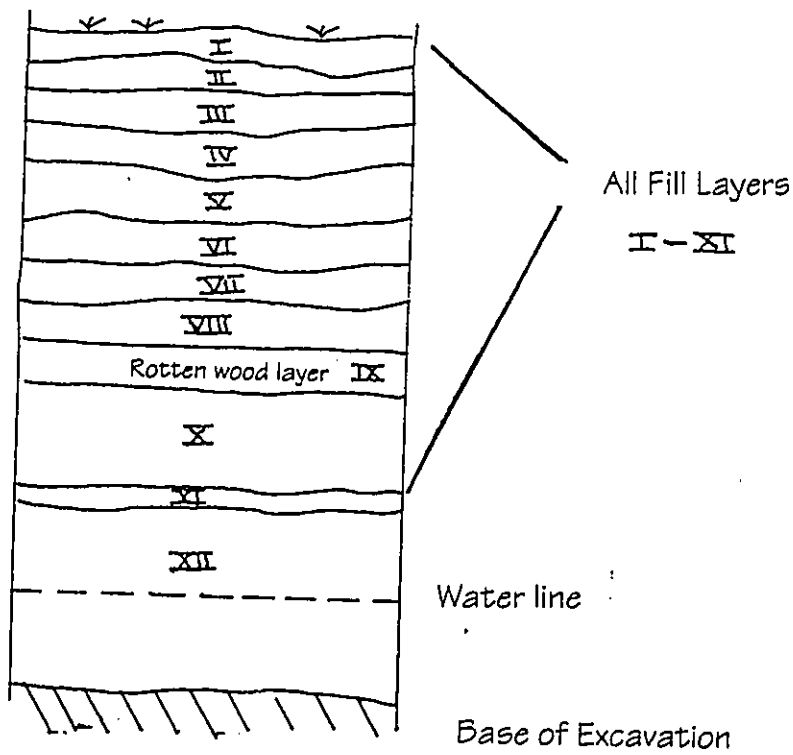

Figure 6 Profile of Backhoe Trench 3

Trench 4
Length: 4.0 m
Width: 0.7 m
Depth: 2.0 m
Orientation: 160/340 degrees TN
Depth of water table: 1.53 m
(See Figure 15--Photographic Appendix)

Stratum I: 10YR 5/2 grayish brown; slightly compact; silty sand; weak, fine, blocky structure; contains general modern rubbish--abundant roots and rootlets, plastics, asphalt fragments, rusted metal; LB = abrupt/smooth; modern fill.

StratumIIa-c: Like Strata I-VII in trench 3, Strata IIa-c are interbedded calcareous sands and terrigenous loams containing modern rubbish and building materials. These are all modern fill sediments.

Stratum II: 10YR 3/4 dark yellowish brown; compact; gravelly loam; structureless; contains few roots and rootlets, coral and limestone cobbles and gravels, a brick fragment, and modern bottle glass; LB = abrupt/smooth; modern marine dredge fill layer.

Stratum IV: 10YR 6/4 light yellowish brown; compact; gravelly, loamy, sand; structureless; contains abundant limestone gravels and cobbles, asphalt fragments; LB = abrupt/smooth; modern fill layer.

Stratum V: 10YR 3/1 very dark gray (moist); slightly compact; clayey loam; structureless; no apparent inclusions but enriched with decomposed plant material; LB = abrupt/smooth; natural sediment deposited in a low energy aquatic environment.

Stratum VI: 10YR 5/1 gray (wet); loose; very coarse sand (calcareous); structureless; no apparent inclusions; natural marine sand deposit.

Trench 5
Length: 3.5 m
Width: 0.7 m
Depth: 1.72 m
Orientation: 341/161 degrees TN
Depth of water table: 1.6 m

Stratum Ia: 10YR 5/3 brown; loose; silty sand (calcareous); strong, fine to medium, blocky structure; contains organic material including roots and rootlets, decomposing grass and weeds, coral gravels, modern bottle glass, rusted metal; LB = abrupt/smooth; modern A-horizon.

Backhoe Trench #4
Orientation: 340° TN
Length: 4.0 m.
Width: 0.70 m.
Depth: 2.0 m.
Water Table: 1.53 m.

North/North East Face

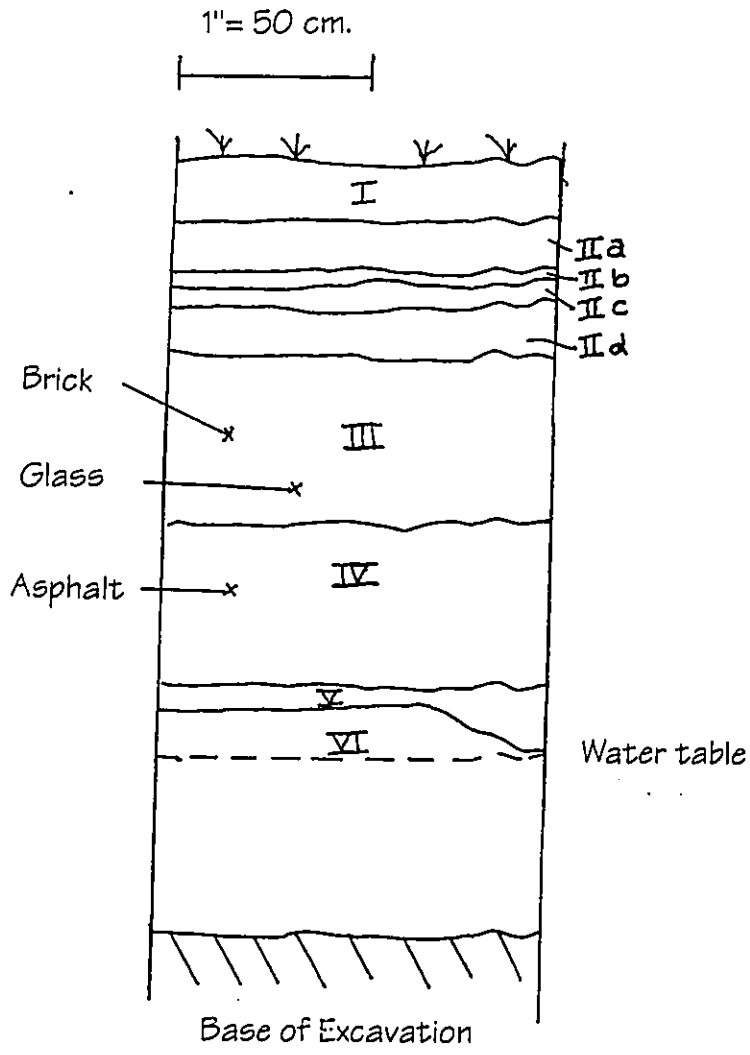

Figure 7 Profile of Backhoe Trench 4

Backhoe Trench #5
Orientation: 341/161° TN
Length: 3.5 m.
Width: 0.70 m.
Depth: 1.72 m.
Water Table: 1.60 m.

North East Face

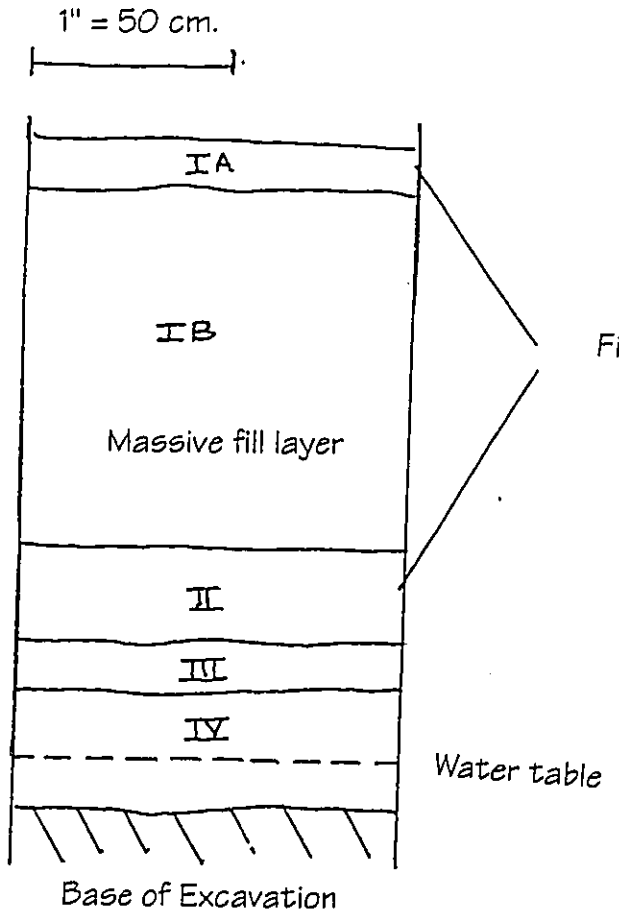

Figure 8 Profile of Backhoe Trench 5

Stratum Ib: 10YR 5/2 grayish brown; loose; silty sand; weak, fine, blocky structure; contains general modern rubbish similar to stratum Ia--abundant roots and rootlets, PVC and iron pipes, plastics, metal wire; LB = abrupt/smooth; massive modern fill layer.

Stratum II: 10YR 3/4 dark yellowish brown; compact; gravelly loam; structureless; contains few roots and rootlets, coral and limestone cobbles and gravels; LB = abrupt/smooth; modern marine dredge fill layer.

Stratum III: 10YR 4/1 dark gray (moist); slightly compact; sandy loam; structureless; no apparent inclusions, although appears to be enriched with decomposed organic material; LB = abrupt/smooth; natural sediment deposited in a low energy aquatic environment.

Stratum IV: 10YR 5/1 gray (wet); loose; medium to coarse sand (calcareous); structureless; no apparent inclusions; natural marine sand deposit.

Trench 6
Length: 3.5 m
Width: 0.7 m
Depth: 2.7 m
Orientation: 249/69 degrees TN
Depth of water table: 2.5 m

Stratum I: 7.5 YR 3/2 dark brown; slightly compact; silty clay loam; structureless; contains concrete fragments, basalt gravels and cobbles, modern rubbish; LB = abrupt/smooth; modern fill layer.

Stratum II: 7.5 YR 5/3 brown; slightly compact; very gravelly sandy loam; structureless; predominant inclusions are coral gravels, also modern rubbish; LB = abrupt/smooth; modern fill layer.

Stratum III: 7.5 YR 3/1 very dark gray; slightly compact; loamy sand; structureless; contains abundant modern construction material rubble; LB = abrupt/smooth; modern demolition material fill layer.

Stratum IV: 10 YR 5/1 gray; slightly compact; gravelly loamy sand; structureless; contains abundant coral cobbles and gravels, shell fragments; LB = abrupt/smooth; appears to be a marine dredge fill deposit.

Stratum V: 2.5 Y 2.5/1 black; slightly compact; silty clay loam; structureless; appears to contain decomposing plant material; appears to be a natural marsh sediment.

Backhoe Trench #6
Orientation: 249° TN
Length: 3.5 m.
Width: 0.70 m.
Depth: 2.7 m.
Water Table: 2.50 m.

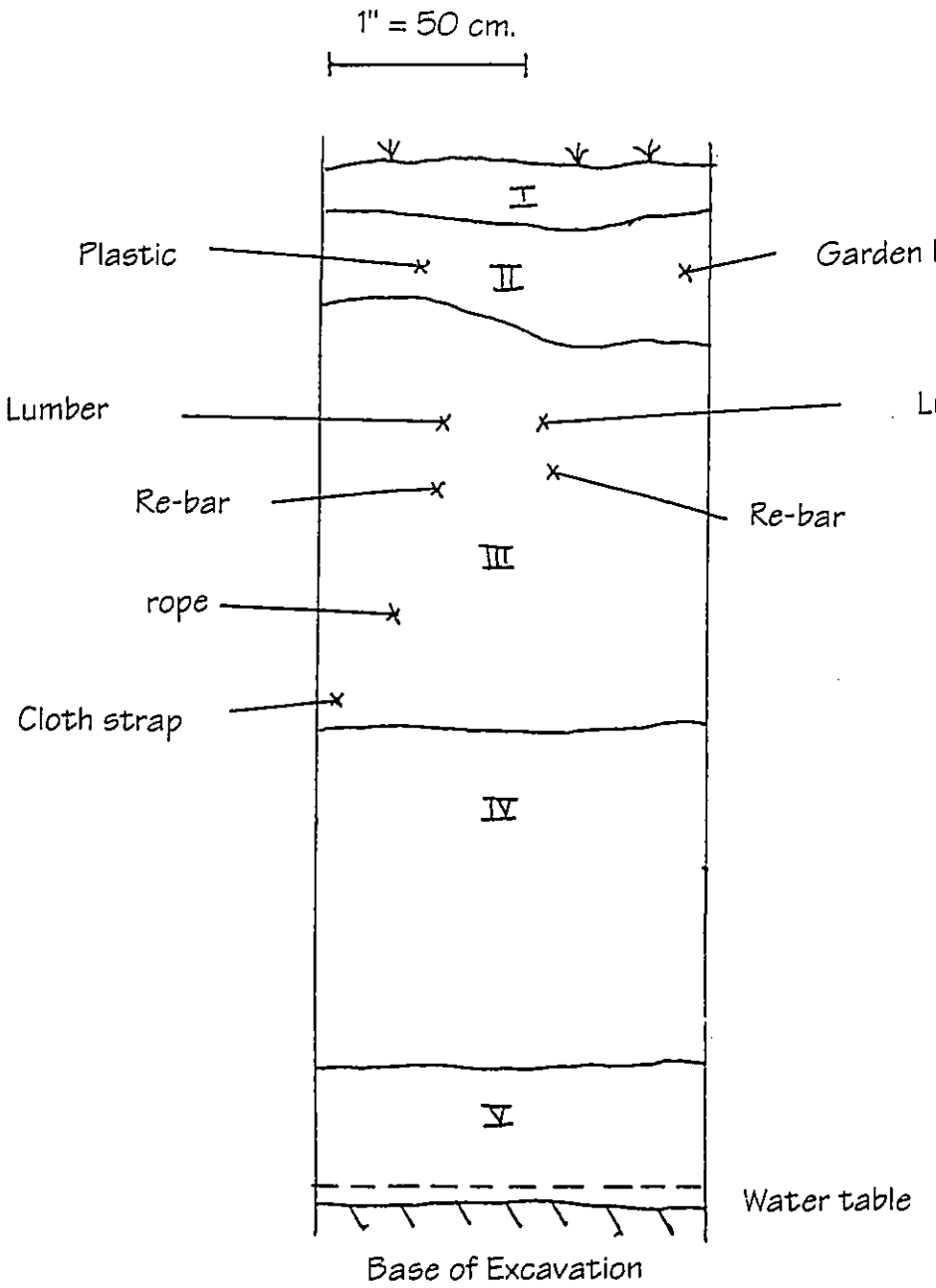

Figure 9 Profile of Backhoe Trench 6

Trench 7
Length: 2.0 m
Width: 0.7 m
Depth: 0.25 m
Orientation: 246/66 degrees TN
Depth of water table: N/A

Stratum I: 7.5 YR 4/3 brown; very compact; gravelly sandy loam; structureless; contains abundant coral gravel, some basalt gravel, some coral cobbles, modern rubbish; LB = very abrupt/smooth; modern fill layer.

The excavation of trench 7 was terminated at a depth of 25 cm below surface when a subsurface concrete slab was encountered. The dimensions of the concrete slab were not determined, however, it was visible in all portions of the trench. This concrete slab is undoubtedly resting on the modern fill layers that were observed in the upper levels of all the other trenches in the project area. Situated on top of these fill layers, this concrete slab is undoubtedly modern. The slab function is unknown, however it is thought to be related to the excavation of the adjacent Kaelepulu "inner" canal and the `Oneawa canal. Perhaps it is the foundation for a shed.

Trench 8
Length: 3.4 m
Width: 0.8 m
Depth: 1.85 m
Orientation: 340/160 degrees TN
Depth of water table: 1.6 m

Stratum I: basalt gravel, sorted, construction grade.

Stratum II: 7.5 YR 4/2 brown; compact; silty sand; structureless; contains abundant modern rubbish, basalt gravels, coral gravels, cement and brick fragments; LB = very abrupt/wavy; modern fill deposit.

Stratum III: 10 YR 6/4 light yellowish brown; loose, fine sand (calcareous); structureless; contains concrete fragments, basalt gravels, metal wire, other modern rubbish; LB = abrupt/smooth; modern fill layer.

Stratum IV: 2.5 Y 2.5/1 black; asphalt, discontinuous across trench.

Stratum V: 10 YR 4/3 brown; very compact; gravelly silty clay; structureless; contains basalt and coral gravel; LB = abrupt/smooth; modern fill material.

Stratum VI: 5 YR 4/1 gray; compact; very gravelly sandy clay loam; structureless; contains coral and basalt gravels; LB = abrupt/smooth; modern fill sediment.

Stratum VII: 10YR 4/1 dark gray (moist); slightly compact; sandy loam; structureless; no apparent inclusions, although appears to be enriched with decomposed organic material; LB = abrupt/smooth; natural sediment deposited in a low energy aquatic environment.

Backhoe Trench #8
Orientation: 340/160° TN
Length: 3.4 m.
Width: 0.80 m.
Depth: 1.85 m.
Water Table: 1.60 m.

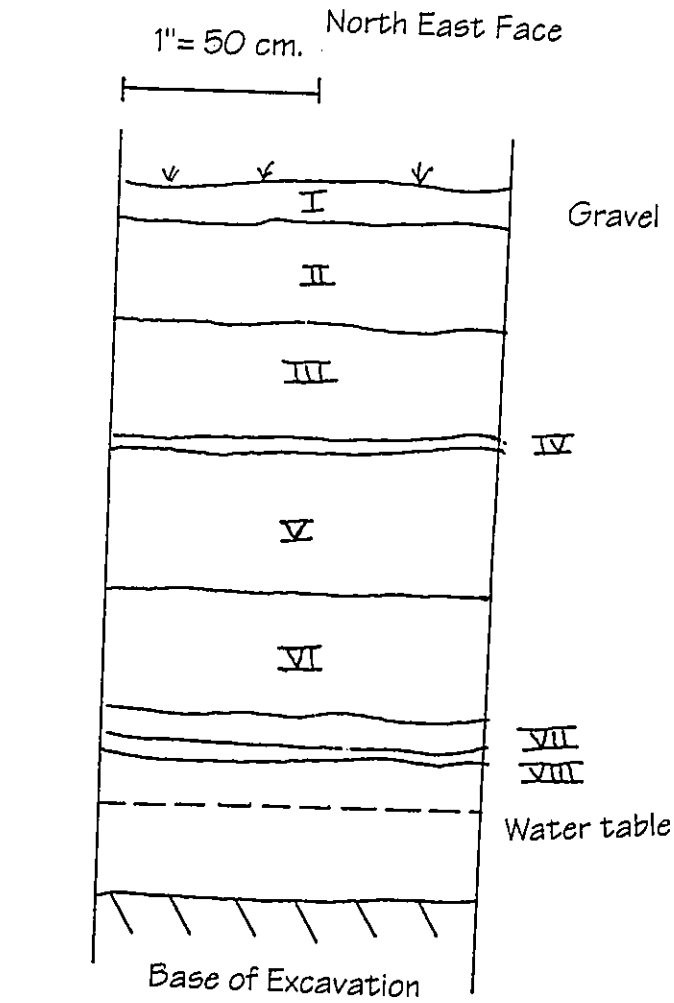

Figure 11 Profile of Backhoe Trench 8

StratumVIII: 10YR 5/1 gray (wet); loose; medium to coarse sand (calcareous); structureless; no apparent inclusions; natural marine sand deposit.

VI. PROJECT SUMMARY

The parcel of land to be affected by the proposed improvements to the Kawainui Marsh Park is located on a leveled embankment that is presently utilized for parking and access to the dike road. One hundred percent of the project area was inspected on foot by a crew of three archaeologists on June 17th, 2000. On the same day 8 backhoe trenches were excavated through out the project area. Prior to the field work, documentary research was conducted and a predictive model was developed concerning the potential for historic properties within the project area. Based on documentary research, the project area was not used intensively historically, and it is doubtful the project area was ever intensively utilized prehistorically. During the field inspection, no signs of traditional-Hawaiian land use were observed. The stratigraphic profiles of the test trenches all confirmed that the vicinity of the project area has been artificially elevated by modern fill layers associated with the construction of the Kawainui drainage system. Prior to these fill deposits this portion of Kailua was a low lying area prone to flooding. Field inspection and backhoe test excavations of the parcel revealed that it contains no historic properties.

VII. RECOMMENDATIONS

Based on the inventory findings, there are no historic properties within the project area of the proposed Kawainui Park Improvements. The proposed park improvements will have no effect on historic properties. No further historic preservation work is recommended.

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PHOTOGRAPHIC APPENDIX

Figure 12 General View of the Project Area Shot to the East-Southeast

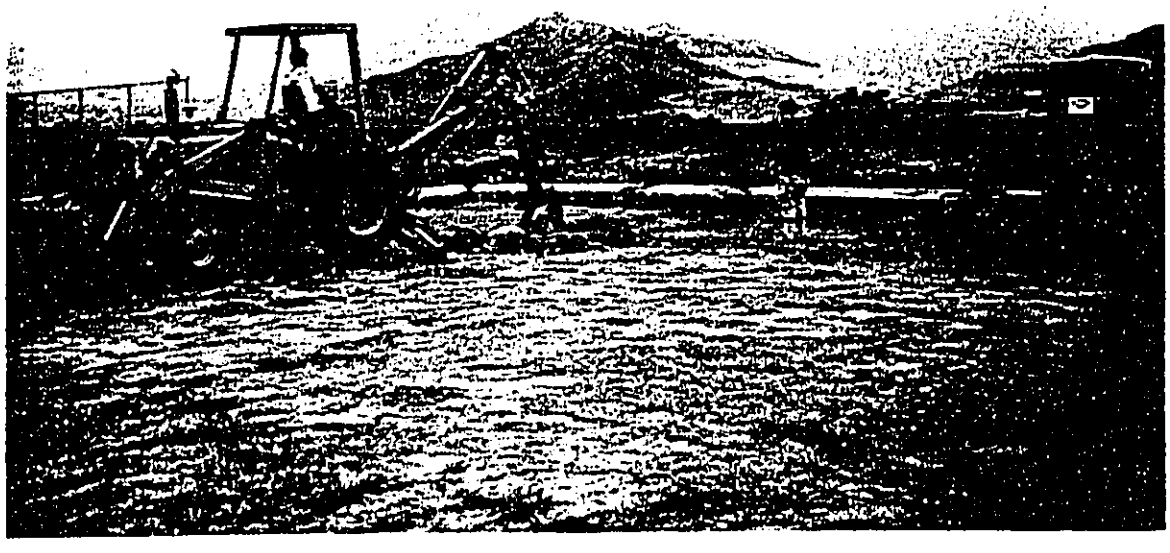


Figure 13 General View of the Project Area, Excavation in Progress of Trench 1, Shot to the Southwest

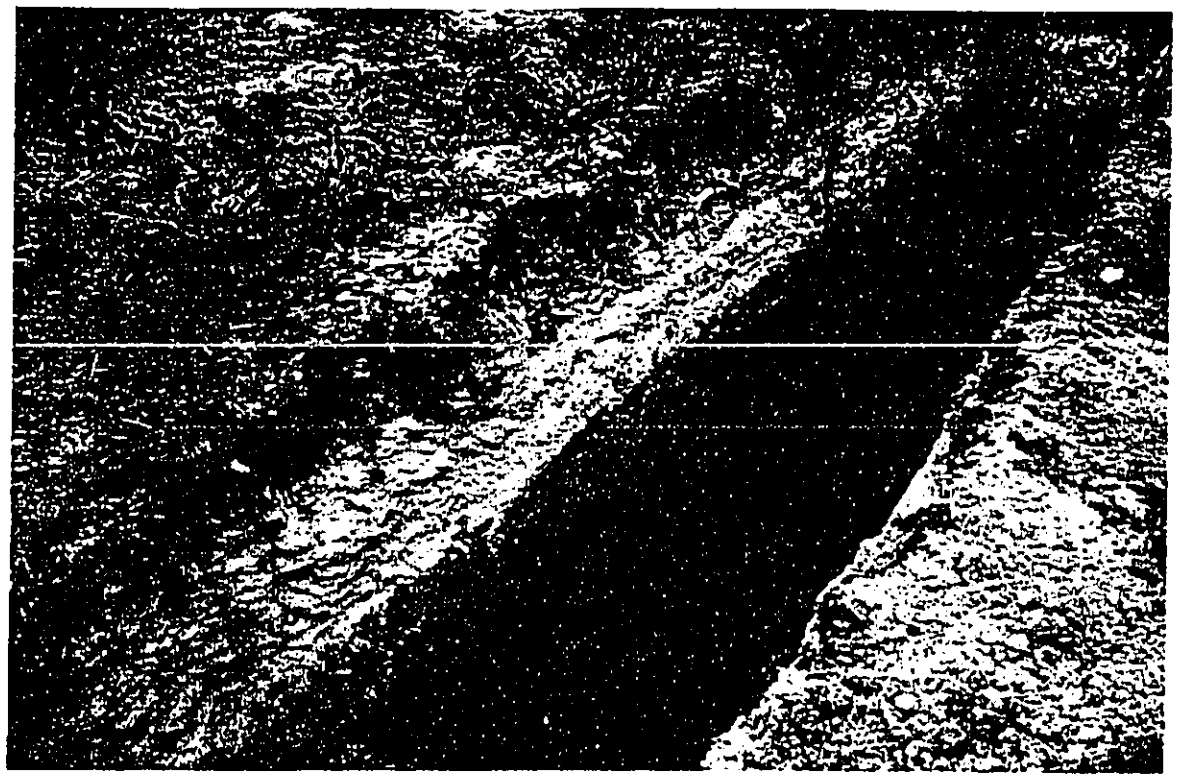


Figure 14 Representative Stratigraphy in the Project Area, Trench 4, Shot to the South

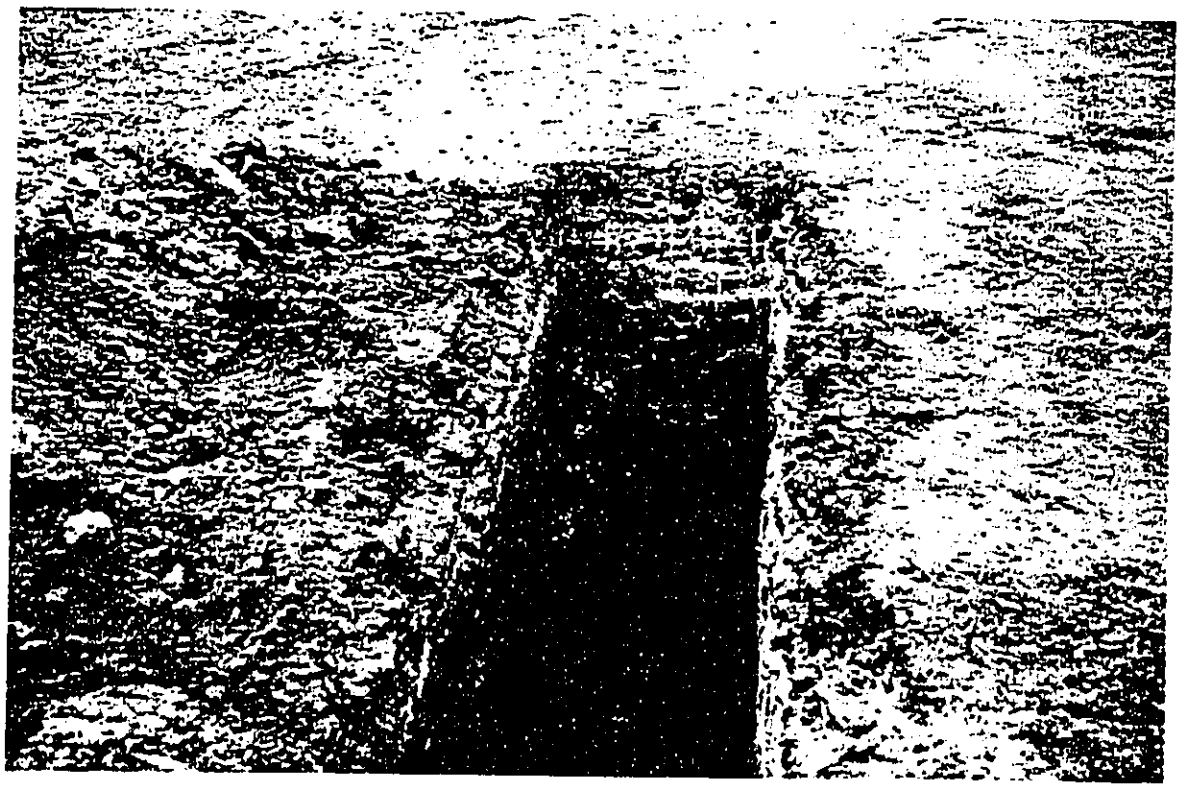
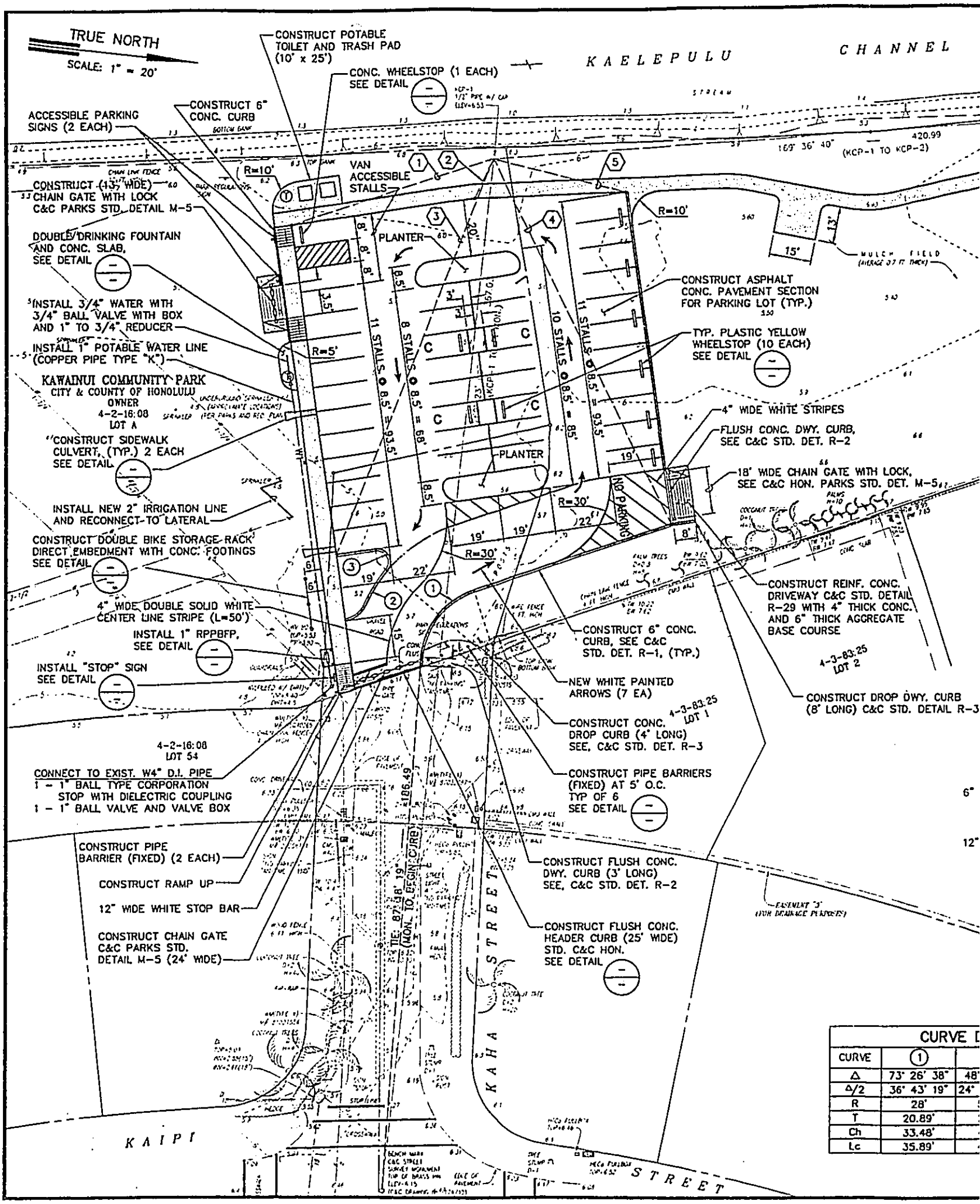


Figure 15 Representative Stratigraphy in the Project Area, Trench 1, Shot to the Southwest



CURVE D		
CURVE	(1)	
Δ	73° 26' 38"	48°
Δ/2	36° 43' 19"	24°
R	28'	
T	20.89'	
Ch	33.48'	
Lc	35.89'	

CONSTRUCT CONCRETE SIDEWALK (4' WIDE)

CONSTRUCT SIDEWALK CULVERT, SEE DETAIL (TYP.)

R=4'

EXISTING KAWAINUI DIKE

4-3-83:25 LOT 3

4-3-83:25 LOT 4

4-3-83:25 LOT 5

DROP DWY. CURB &C STD. DETAIL R-3

NEW PARKING LOT PAVEMENT

2" ASPHALT CONC.

8"

ROUND 1/8"

EXISTING PAVEMENT

12"

6" BASE COURSE

12" SUBBASE COURSE

NEW FLUSH CONC HEADER

RECOMPACT SUBGRADE

CONCRETE HEADER DETAIL

NOT TO SCALE

① 335° 35' 03" 75.71 (KCP-1 TO CORNER)

② 288° 32' 17" 15.35 (KCP-1 TO P.I. SIDEWALK)

③ 285° 08' 28" 150.19 (KCP-1 TO CORNER)

④ 236° 57' 53" 143.87 (KCP-1 TO CORNER)

⑤ 187° 30' 33" 49.01 (KCP-1 TO CORNER)

CURVE DATA		
①	②	③
73° 26' 38"	48° 01' 01"	138° 01' 01"
36° 43' 19"	24° 00' 30.5"	69° 00' 30.5"
28'	52.00'	4.75'
20.89'	23.16'	12.38'
33.48'	42.31'	8.87'
35.89'	43.58'	11.44'

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

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RECONSTRUCT/REFURBISH PLAY COURTS/APPARATUS/AREAS AT RECREATION DISTRICT 4 - KAWAINUI COMMUNITY PARK

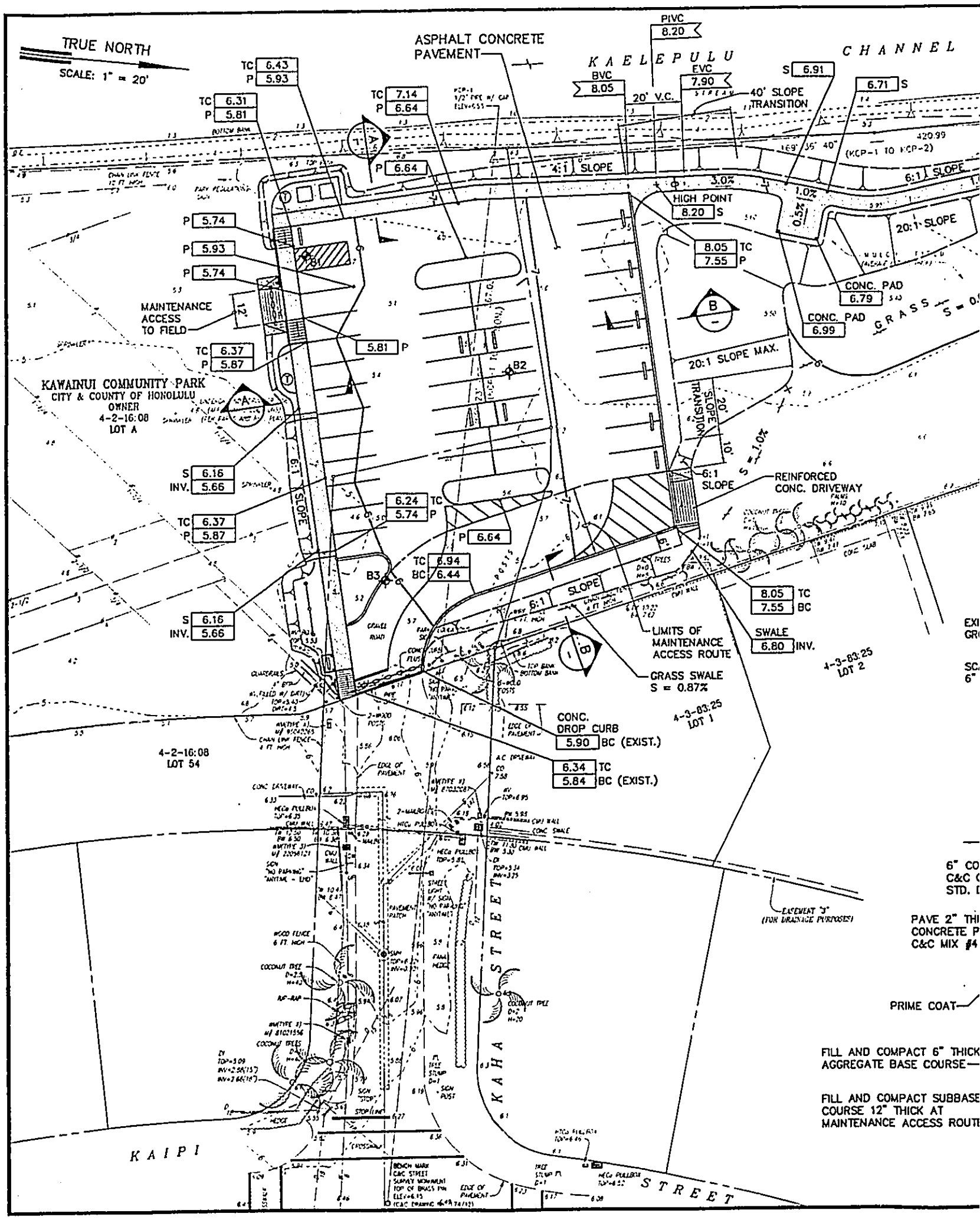
SITE PLAN

JOB NO. 99-P-00

DRAWING NO. 0-0

SHEET NO. 3 OF 0

FILE NO. 000/000


TRUE NORTH
SCALE: 1" = 20'
ASPHALT CONCRETE PAVEMENT
KAELEPULU CHANNEL
PIVC 8.20
BVC 8.05
EVC 7.90
20' V.C.
40' SLOPE TRANSITION
S 6.91
6.71 S
(MCP-1 TO MCP-2)
4:1 SLOPE
6:1 SLOPE
20:1 SLOPE
3.0%
1.0%
0.5%
HIGH POINT 8.20 S
8.05 TC 7.55 P
CONC. PAD 6.79
CONC. PAD 6.99
GRASS S = 0.5
20:1 SLOPE MAX.
20' SLOPE TRANSITION
10'
S = 1.0%
REINFORCED CONC. DRIVEWAY
8.05 TC 7.55 BC
SWALE 6.80 INV.
LIMITS OF MAINTENANCE ACCESS ROUTE
GRASS SWALE S = 0.87%
CONC. DROP CURB 5.90 BC (EXIST.)
6.34 TC 5.84 BC (EXIST.)
MAINTENANCE ACCESS TO FIELD
12'
KAWAINUI COMMUNITY PARK
CITY & COUNTY OF HONOLULU
OWNER
4-2-16:08
LOT A
4-2-16:08
LOT 54
4-3-83:25
LOT 2
4-3-83:25
LOT 1
TC 6.43 P 5.93
TC 6.31 P 5.81
TC 7.14 P 6.64
P 6.64
P 5.74
P 5.93
P 5.74
5.81 P
TC 6.37 P 5.87
S 6.16 INV. 5.66
TC 6.37 P 5.87
6.24 TC 5.74 P
P 6.64
TC 6.94 BC 6.44
S 6.16 INV. 5.66
B1
B2
B3
EASEMENT "J" (FOR DRAINAGE PURPOSES)
KAHA STREET
KAIPI STREET
6" CO
C&C
STD.
PAVE 2" THI
CONCRETE P
C&C MIX #4
PRIME COAT
FILL AND COMPACT 6" THICK
AGGREGATE BASE COURSE
FILL AND COMPACT SUBBASE
COURSE 12" THICK AT
MAINTENANCE ACCESS ROUTE
PM: LHF
OPER: CDK *FAI
REVISED: 7/20/00
DATE: 1/12/00
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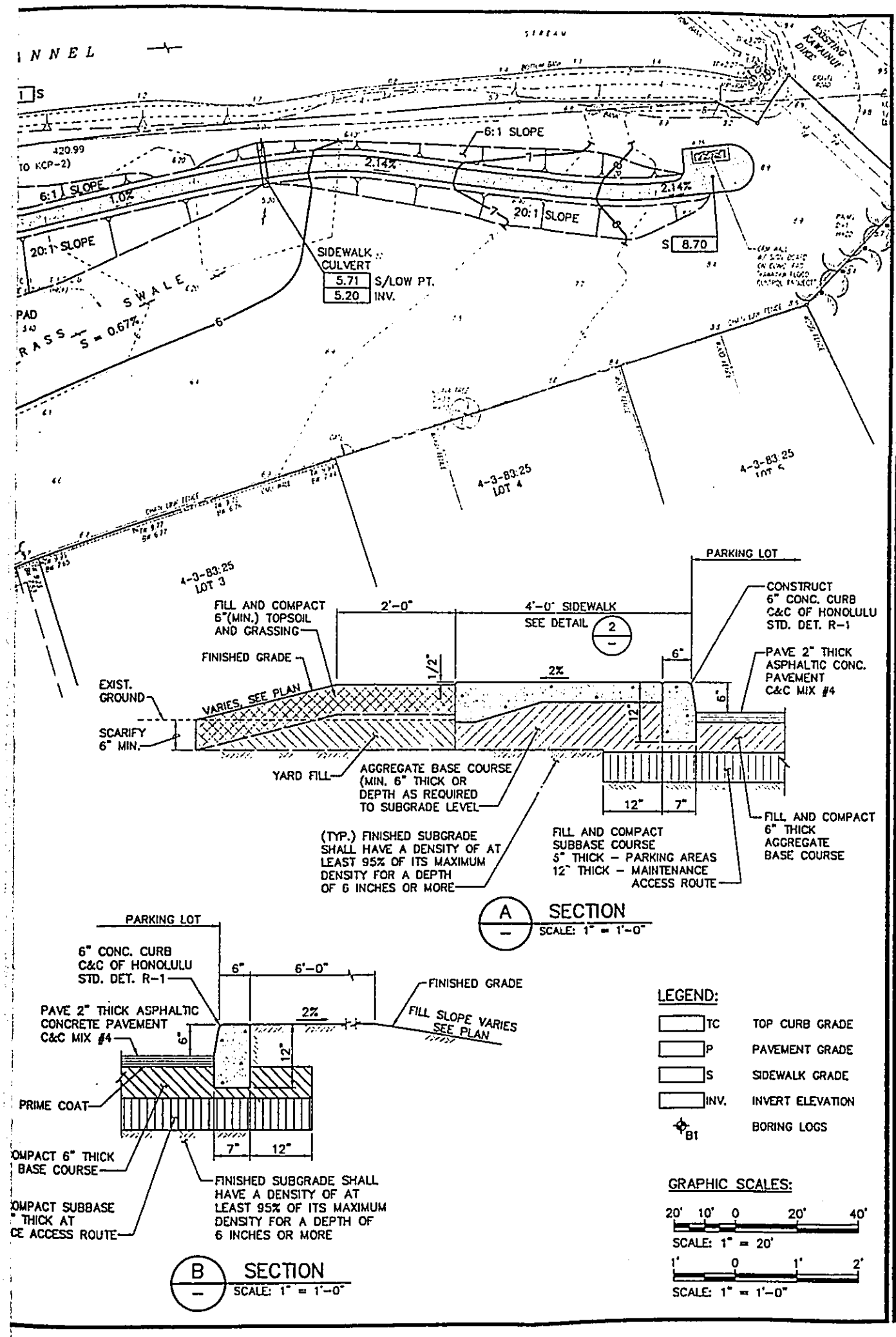

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