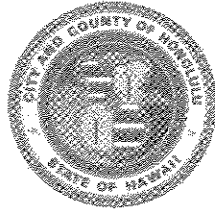


DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432



EILEEN R. ANDERSON
MAYOR

MICHAEL M. MCELRI
DIRECTOR

ROBERT B. JONES
DEPUTY DIRECTOR

April 5, 1983

(SM)

Mr. Roy Takemoto, Chairman
Environmental Quality Commission
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Takemoto:

Revised Environmental Impact Statement (EIS)
Heeia Kea Subdivision
Hawaiian Electric Company, Inc.
Heeia, Koolaupoko, Oahu, Hawaii
Tax Map Keys: 4-6-06: 1-3, 7-16, 22-51; 4-6-16: 32

We are notifying you of our acceptance of the above as an adequate fulfillment of Chapter 343, HRS.

Major issues, not directly related to Special Management Area concerns, but considered to be controversial include:

1. Appropriateness of a Residential Subdivision;
2. Cumulative Impacts of Proposed Projects;
3. Foreclosure of Future Planning Options; and
4. Increased Usage of Local Recreational Facilities.

Along with the application for a Special Management Area Use Permit, the applicant will submit the following information:

1. Sewage Disposal
2. Drainage
3. Grading
4. Clearing and Landscaping
5. Archaeological Concerns

Mr. Roy Takemoto, Chairman
Page 2

Other concerns, which will be addressed by subsequent permit processes, include:

1. Water Commitment from the Board of Water Supply;
2. Highway Improvement Plans, as required by the State Department of Transportation; and
3. Allocation of Low and Moderate Income Housing to be coordinated with the Department of Housing and Community Development.

If there are any questions, please contact Sampson Mar of our staff at 523-4077.

Very truly yours,



MICHAEL M. McELROY
Director of Land Utilization

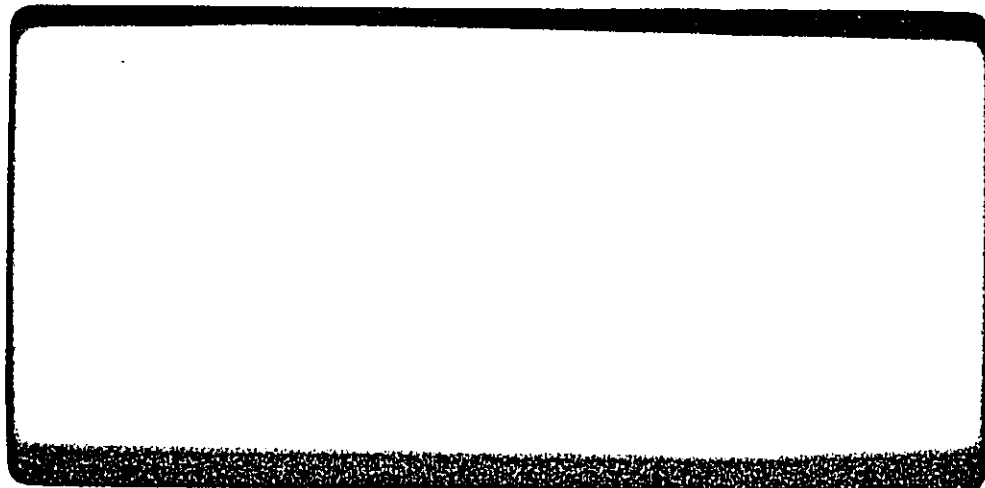
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REVISED
ENVIRONMENTAL IMPACT STATEMENT
FOR
HEEIA KEA SUBDIVISION
HEEIA, KOOLAUPOKO, OAHU

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS
Civil / Sanitary

OA
300



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REVISED
ENVIRONMENTAL IMPACT STATEMENT
FOR
HEEIA KEA SUBDIVISION
HEEIA, KOOLAUPOKO, OAHU

3/83

Prepared By:
GRAY, HONG & ASSOCIATES, INC.
119 Merchants Street, Suite 607
Honolulu, Hawaii 96813

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I. SUMMARY

Hawaiian Electric Company, Inc. proposes to have a 389 lot single-family residential subdivision constructed on 87± acres of land at Heeia Kea, Oahu, Hawaii. The proposed Heeia Kea Subdivision is directly mauka of the existing Heeia Kea residential lots which cover approximately 15± acres. The combined areas consist of 102± acres and for the purposes of this report, the project is considered to contain 102 acres. The 102 acres of land are zoned R-6 residential and are part of 219.06 acres controlled by Hawaiian Electric Company under a lease and agreement of sale from Kamehameha Schools/Bishop Estate. The subdivision site was originally acquired for a steam generating plant. However, a Class AA water quality designation was subsequently established for Kaneohe Bay which made power generation unfeasible. Due to the fact that Hawaiian Electric Company, Inc. is still obligated to purchase the land, other options were explored leading to the proposal to construct the 389-lot Heeia Kea Subdivision.

The project consists of the construction of on-site roadways, drainage system, sewer system, water system and underground electric and telephone systems. Off-site construction necessary to implement the project is the construction of sewer system in conformance with the City and County's master plan to allow connection to the City and County sewer system. In addition, two (2) intersections with Kamehameha Highway will be necessary. These intersections will have acceleration and deceleration lanes as well as left-turn storage lanes. The estimated cost of construction for site development is 9-11 million dollars. The estimated construction schedule calls for 3 to 5 phases

over 6 to 9 years, but this schedule is flexible since economic and market conditions will dictate development.

The Special Management Area extends 300 feet mauka of Kamehameha Highway and the makai portion of the subdivision lies within this area. However, four existing drainage structures passing under Kamehameha Highway appear adequate to handle drainage and no work is proposed within the shoreline setback.

Environmental impacts associated with the project are increased traffic on Kamehameha Highway, potential water quality degradation to Kaneohe Bay during construction earthwork activities, noise and increased demands on public utilities and facilities. None of the foregoing impacts either singularly or cumulatively are considered unacceptable. Separate mitigation measures are proposed as a part of the project to offset the specified environmental impacts.

Alternatives to the project have been explored. Included among alternatives have been no action, agricultural development and residential development of a smaller magnitude and cluster housing. Agricultural development is not considered feasible and reduced scale development has the same type of impacts as the proposed project. Reduced scale development will have a lesser impact on Kamehameha Highway traffic and potentially lesser effect on the water quality of Kaneohe Bay, but the impact of the proposed subdivision is not considered unacceptable.

Irreversible and irretrievable commitments of the project relate to the land. Once the project is completed, all other options will be unavailable. Irreversible and irretrievable commitments on energy and

water supply also exist, however, the magnitude of those commitments are not significant compared to present island wide supply and demand.

II. DESCRIPTION OF THE PROPOSED ACTION

A. Project Location

The Heeia Kea Subdivision will be located within Windward Oahu at Heeia, Koolaupoko, Oahu (see Location Map - Figure 1). The proposed subdivision, as shown on Figure 2 (Proposed Heeia Kea Subdivision Plan) consists of 102+ acres of land mauka of Kaneohe Bay and Kamehameha Highway, and in the vicinity of the Heeia Kea Small Boat Harbor.

The 102+ acres of subject land is a portion of 219.06 acres, all of which are owned by Kamehameha Schools/Bishop Estate and controlled by Hawaiian Electric Company, Inc. under a lease and agreement-of-sale. The total 219.06 acres are described by TMK: 4-6-06: 1 through 3, 7 through 16, 22 through 51 and TMK: 4-6-16: 32. A 0.96 acre portion of land makai of Kamehameha Highway (TMK: 4-6-06: 2, 3, 8, 10, 12 14, 16 and 45 through 47) and 116.1 acre portion of land mauka of Kamehameha Highway above the conservation district boundary (TMK: 4-6-16: Por 32) are included in the total 219.06 acre land holding, but not part of the 102 acre project site. Figures 3 and 4 show tax maps for the total 219.06 acres and the 102+ acres which comprise the project site.

B. Statement of Objectives

Hawaiian Electric Company, Inc. originally entered into a long term lease and agreement-of-sale to acquire the project area for

FIGURE 1
U. S. G. S. MAPPING

RIDGE LINE AND
HAWAIIAN ELECTRIC CO.
PROPERTY LINE

HEEIA KEA SUBDIVISION
PROJECT SITE
102± ACRES

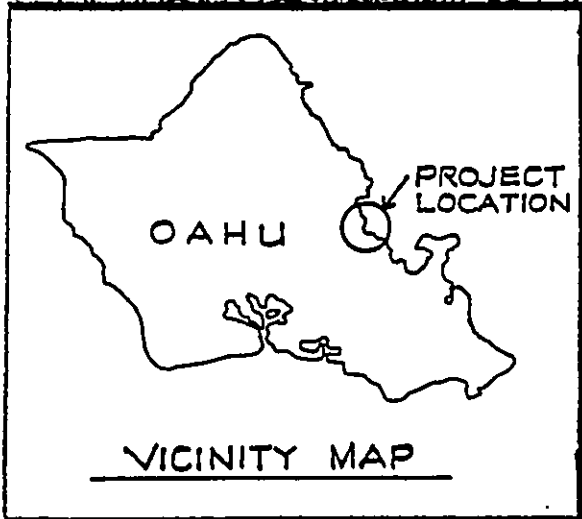
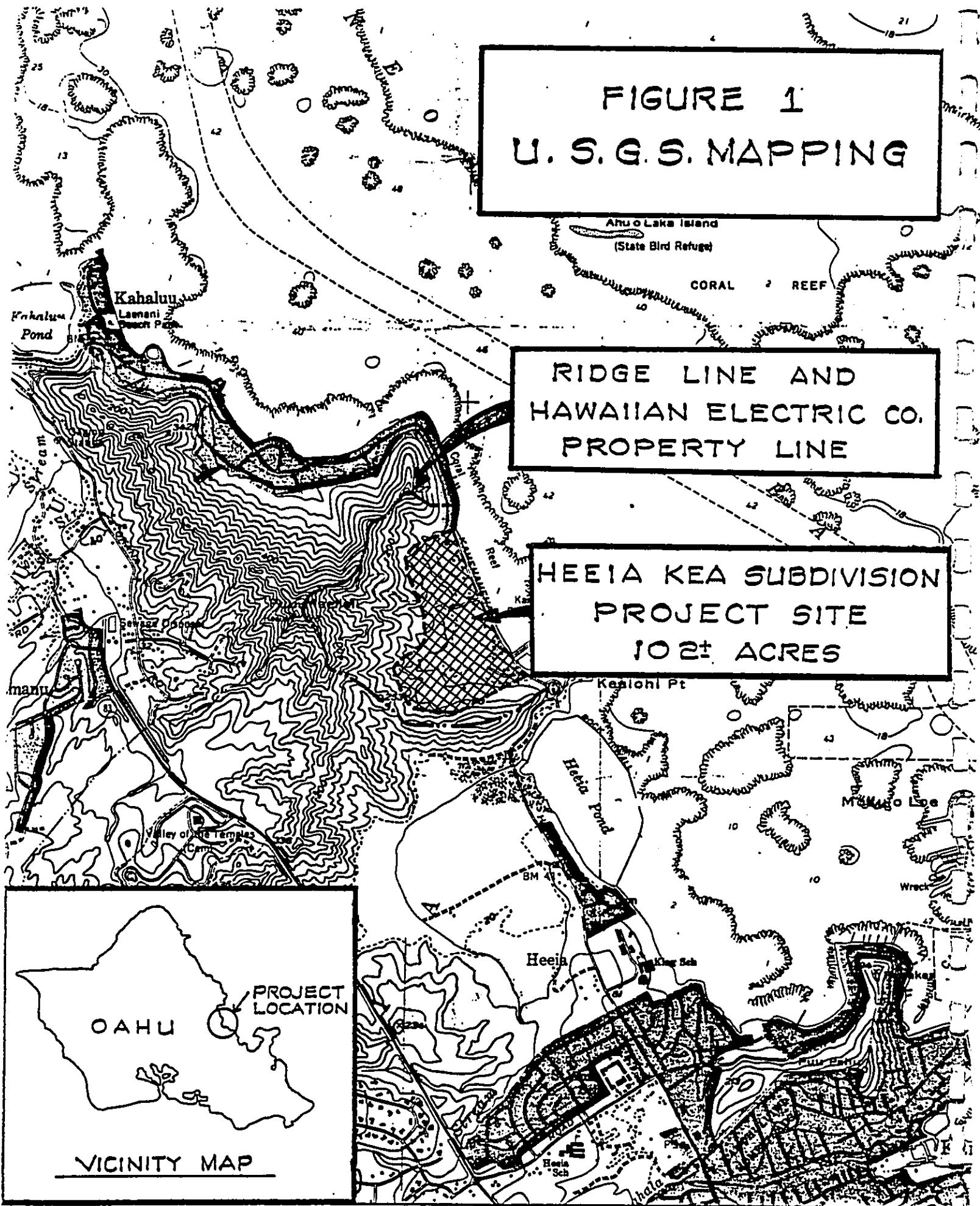


FIGURE 2

PROPOSED

HEEIA KEA SUBDIVISION

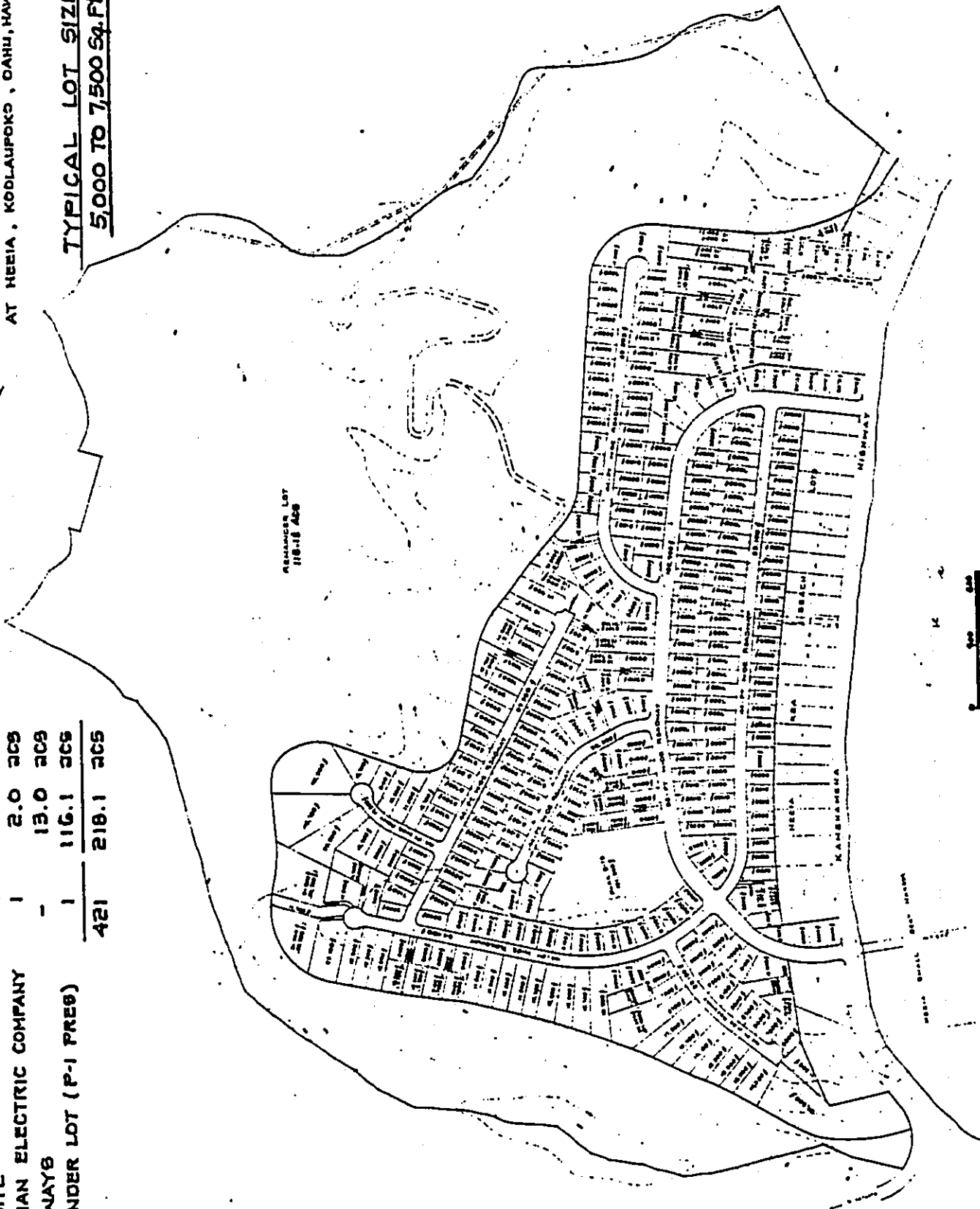
TAX MAP KEY: 4-6-16:92 et al

AT HEEIA, KODLAUPOKO, OAHU, HAWAII

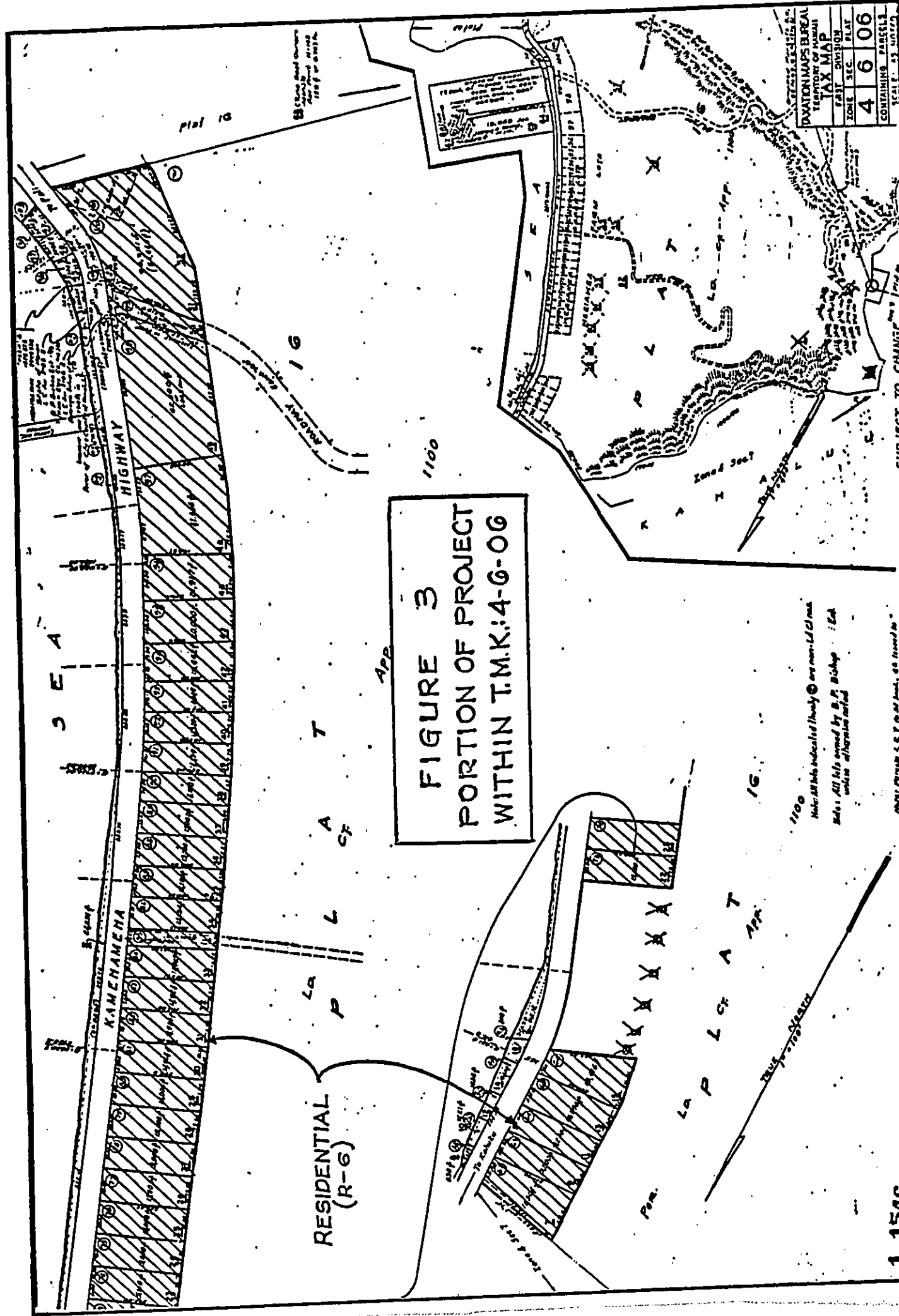
TYPICAL LOT SIZE
5,000 TO 7,500 Sq. Ft.

	NO.	AREA
PROPOSED LOTS (MIN. 9,000 sq ft)	389	69.2 ACS
EXISTING LOTS (MIN. 13,000 sq ft)	29	14.3 ACS
PARKSITE	1	3.5 ACS
HAWAIIAN ELECTRIC COMPANY	1	2.0 ACS
ROADWAYS	-	13.0 ACS
REMAINDER LOT (P-1 PRES)	1	116.1 ACS
	421	218.1 ACS

REMAINDER LOT
116.1 ACS



Scale in Feet



RESIDENTIAL
(R-6)

FIGURE 3
PORTION OF PROJECT
WITHIN T.M.K.:4-G-06

1 1546

POR. HEERIA, KOOLAUPOKO, OAHU

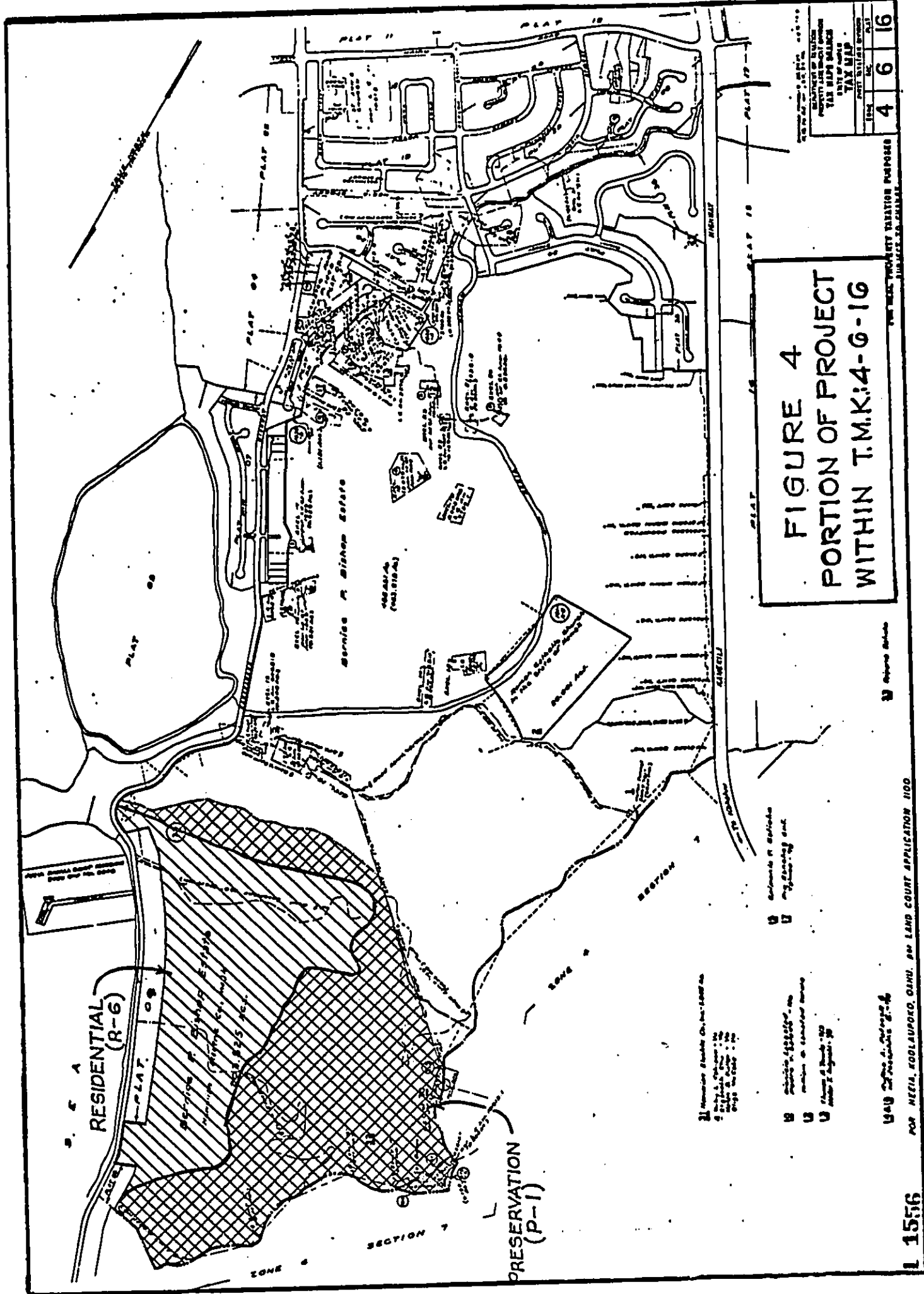
Note: All lots indicated thereby are owned by the same person. All lots owned by B.P. Bishop are indicated as such.

Scale: 1" = 100' (approx.)

TERRITORY OF HAWAII			
TAX MAP			
PLAT	DIVISION	ZONE	SEC.
4	6	06	
CONTAINING PARCELS			SCALE: AS SHOWN

SUBJECT TO CHANGE

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1



the purpose of constructing a steam generating plant to supply electricity to Oahu. Since the time of Hawaiian Electric Company's original agreement with Bishop Estate, a Class AA water quality classification has been assigned to Kaneohe Bay. Based on the Class AA classification of Kaneohe Bay and other factors, the construction of a steam generating plant is no longer feasible, however, Hawaiian Electric Company is still committed to purchase the land.

Since the originally intended use of the project site is no longer feasible, Hawaiian Electric Company has explored other uses of the property. Market investigations indicate that there is a strong demand for single-family residential lots in desirable areas on Oahu. Based on the counsel of the project's professional marketing consultant, Cowell & Company, Inc, it has been determined that the creation of single-family residential housing including some low and moderate cost units will be responsive to market demands and create the greatest economic utility of the site. Based upon studies by the project's engineering consultants it has been determined that the site is well suited for residential housing. Hawaiian Electric Company, with the concurrence of Kamehameha Schools/Bishop Estate, has subsequently made a decision to proceed with the work necessary to create the 102 acre Heeia Kea Subdivision, a proposed single-family residential project.

Therefore, Hawaiian Electric Company's objectives for creating the proposed subdivision are to provide marketable residential housing including some low and moderate cost units to serve the

needs of the Windward Oahu area and also receive a reasonable return on invested capital. The Department of Housing and Community Development has endorsed the project (see DHCD's comment letter - Section XIII).

C. General Description of the Actions, Technical, Economic, Social and Environmental Characteristics

1. Technical Characteristics

The Heeia Kea Subdivision shown on Figure 2 is totally within an R-6 Residential Zoning District. The lands mauka of the project site are zoned P-1 Preservation and the boundary between the two zoning districts represents the State Conservation District Land Use Boundary which was established in 1962. The Heeia Kea Subdivision will create new residential lots, a parksite and roadways. In addition, 29 existing lots fronting Kamehameha Highway and the existing Hawaiian Electric Company Base Yard, while not being a part of the proposed subdivision, will be provided with sewer improvements and some of the existing lots will be subject to drainage improvements. Figure 2 summarizes the number of lots and total land area involved within the project.

Work necessary to complete the Heeia Kea Subdivision are grading, roadway improvements, drainage improvements, sewer system improvements, water system improvements and underground electrical and telephone

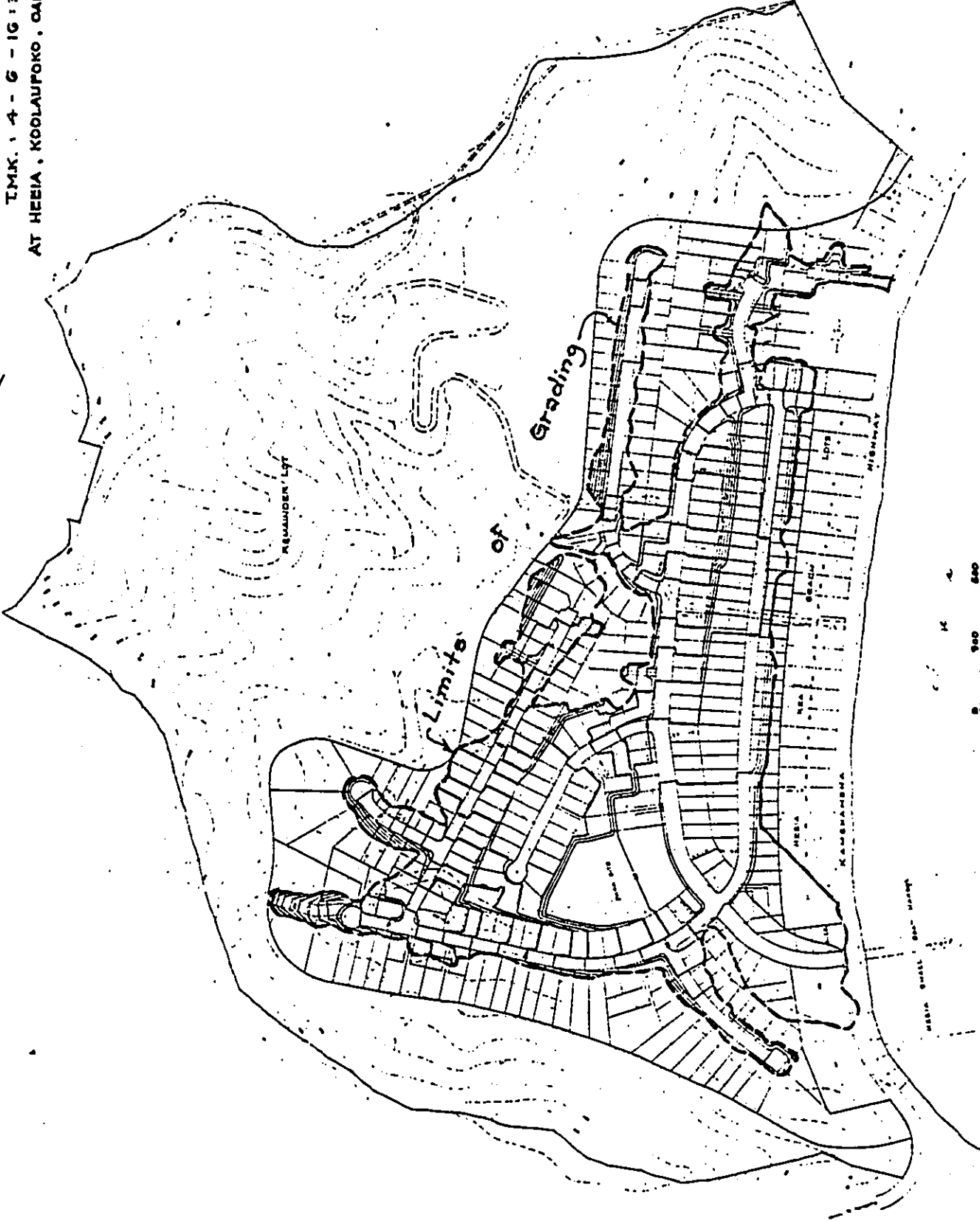
system improvements. A description of each area of work is as follows:

a. Grading. The project site will be graded primarily to assure that the subdivision's roadways maintain proper horizontal and vertical alignment. Grading within the proposed lots is subsequently required to insure proper lot drainage and provide a reasonably level area for house construction. The preliminary grading plan for the subdivision is shown on Figure 5. The average slope of the project area is approximately 10 percent, and based on the preliminary grading plan, the deepest cut or fill necessary to maintain roadway alignment is approximately 15 feet. The total area to be graded is approximately 50 acres and the total amounts of excavation and embankment are 150,000 cubic yards and 250,000 cubic yards, respectively.

Site grading for the project will require the preparation of a final grading plan and an accompanying erosion control plan which must be approved by the City and County of Honolulu Department of Public Works. The Erosion Control Plan will detail the temporary measures and identify permanent measures to minimize soil loss during and after site grading. The temporary measures to minimize soil loss during construction

FIGURE 5
PRELIMINARY GRADING PLAN
HEEIA KEA SUBDIVISION

T.M.K. 1-4-6-16:32
AT HEEIA, KOOLAUPOKO, OAHU, HAWAII



Scale in Feet

will be incremental grading and the use of filter berms and sediment traps. The major method of permanent erosion control is the reestablishment of vegetation, i.e. grassing, after grading.

- b. Roadway improvements. 12,500 linear feet of 56-foot, 44-foot and 32-foot right-of-way roadways, constructed to City and County Standards, are proposed to provide access to all subdivision lots. The roadway system will connect to Kamehameha Highway.

Kamehameha Highway, fronting the project, has a 50-foot right-of-way and contains a two-lane two-way roadway with 20 feet of pavement width. The roadway is owned by the State of Hawaii and maintained by the City and County of Honolulu. It is proposed to make improvements to Kamehameha Highway where the two 56-foot right-of-ways intersect with Kamehameha Highway. The improvements will be the installation of acceleration and deceleration lanes for the south-bound lane of Kamehameha Highway and the installation of left-hand turn storage and through lanes for north-bound traffic. Figure 6 shows a conceptual plan of the proposed intersections. No other improvements to Kamehameha Highway are proposed. The City and County of Honolulu may, at

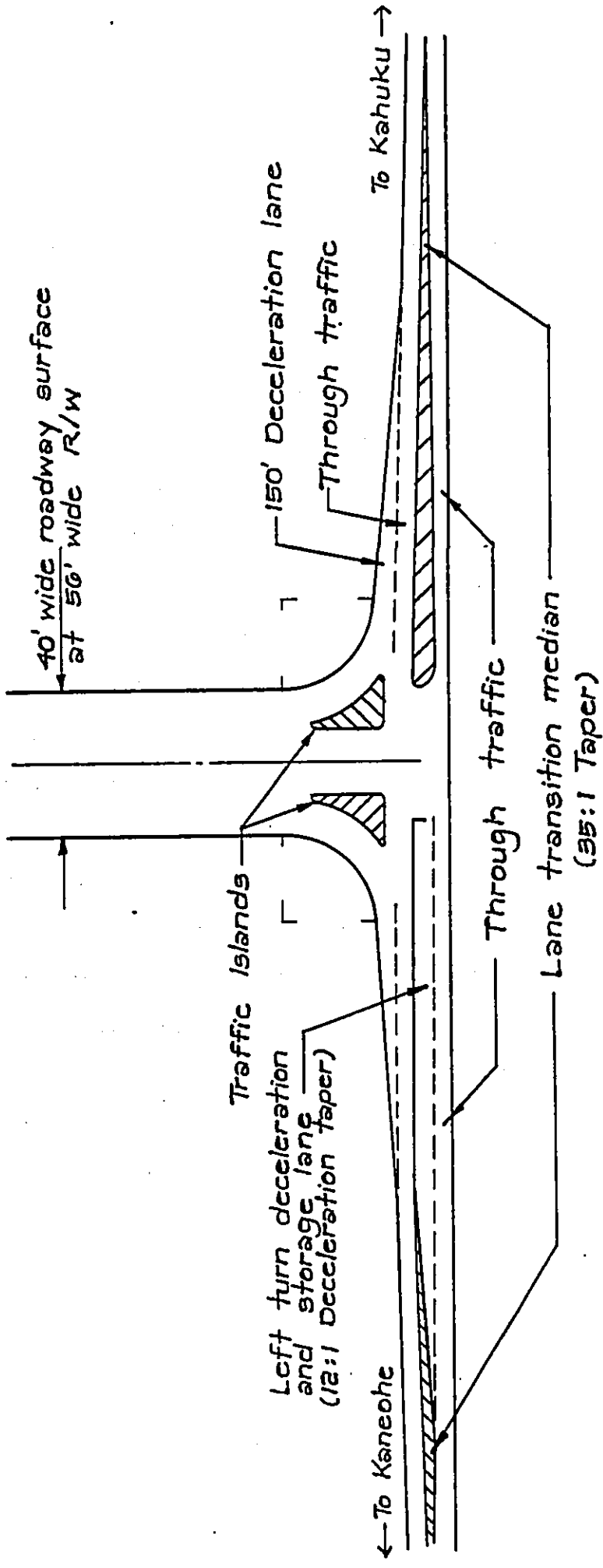


FIGURE 6
CONCEPTUAL INTERSECTION PLAN
50 FT. WIDE R/W INTERSECTIONS W/ KAMEHAMEHA HIGHWAY

(Not to Scale)

some time in the future, wish to increase the roadway width. However, the proposed subdivision does not front Kamehameha Highway. Approximately 29 existing lots front Kamehameha Highway which are not a part of the actual subdivision.

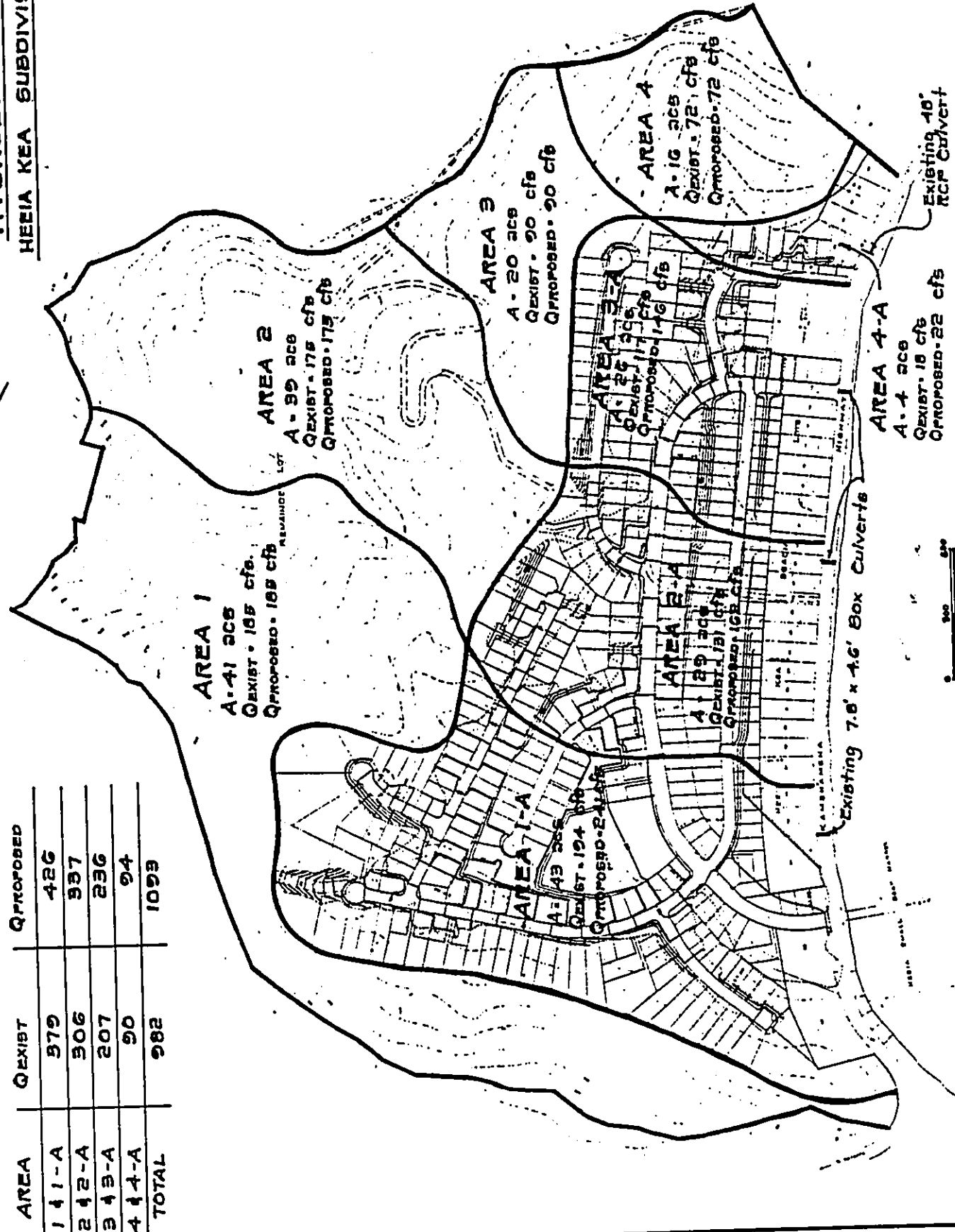
- c. Drainage Improvements. The project site is within a drainage basin bounded by Kaneohe Bay and the ridge line mauka of the project. There are four (4) existing dry gullies (subbasins) within the drainage basin which ultimately discharge all storm water runoff into Kaneohe Bay. Figure 7 (Preliminary Hydrologic Map) illustrates the subbasins and summarizes the existing and anticipated storm water discharges for each subbasin.

There are three (3) existing 7.8' x 4.6' box culverts passing under Kamehameha Highway draining three (3) of the subbasins and one (1) existing 48-inch reinforced concrete pipe draining the remaining subbasin. The location of these drainage structures are also shown on Figure 7. All of the existing box culverts and the 48-inch RCP drain pipe discharging into Kaneohe Bay appears to have sufficient capacity to handle the anticipated design storm water runoff and no box culvert improvements are proposed. In order to provide

FIGURE 7
PRELIMINARY
HYDROLOGIC MAP
HEEIA KEA SUBDIVISION

$Q_{EXIST} = CI(Tc)A = (0.5)(4 \text{ in/hr})(2.25 \text{ Tcorr})(A) = 4.5 \text{ cfs/AC.}$
 $Q_{PROPOSED} = CI(Tc)A = (0.7)(4 \text{ in/hr})(2.0 \text{ Tcorr})(A) = 5.6 \text{ cfs/AC.}$

AREA	Q _{EXIST}	Q _{PROPOSED}
141-A	379	426
242-A	306	337
343-A	207	236
444-A	90	94
TOTAL	982	1093



engineering verification of this statement, a Drainage Report will be prepared and processed with the City and County of Honolulu prior to submission of the Special Management Area Use permit application. Should the conclusions of the Drainage Report modify the current projection regarding the existing box culverts, replacement of the box culverts will be necessary. A shoreline setback variance and Conservation District Use Permit will be required for this work as well as a Department of the Army (DA) permit. However, this specific type of box culvert replacement is covered by the Corps nation-wide general permit. While box-culvert replacement is not considered necessary, the requirements have been stated to disclose all possible alternatives.

Based on the fact that no additional drain outlets into Kaneohe Bay will be necessary, drainage improvements will be limited to:

- i. Catch basins, field inlets and underground pipe system within the subdivision discharging storm water to the existing box culverts;
- ii. Interceptor ditch system at the mauka subdivision boundary to divert storm water

runoff from preservation area into the subdivision drain pipe system; and

- iii. Drainage improvements in the form of drain pipe or channel directly mauka of Kamehameha highway to relieve poor surface drainage within any of the 29 existing subdivision lots subject to poor drainage.

The project site is within Zone D of the Flood Insurance Rate Maps and is not subject to Ordinance 80-62 (Flood Hazard Districts) of the City and County of Honolulu. Zone D represents areas of undetermined, but possible, flood hazard. As previously stated, a Drainage Report will be prepared and submitted to the City and County of Honolulu Department of Public Works for review prior to submission of the Special Management Permit application which will, in part, verify any Flood Hazard District Requirements.

- d. Water System Improvements. An on-site water system consisting of 8-inch water line and fire hydrants will be installed within the subdivision roadways in accordance with the Board of Water Supply Standards. In addition, each subdivision lot will be provided with a service lateral and meter box. All lots are below elevation 170 feet and therefore, the existing 8-inch distribution line

within the Kamehameha Highway right-of-way will provide adequate pressure to each lot. The existing 8-inch distribution line is fed by a 30-inch transmission main which is also located within the Kamehameha Highway right-of-way. The 30-inch transmission main is a part of the Board of Water Supply's 272' Punaluu System as well as a part of the system serving Kaneohe, Kailua, Waimanalo and Hawaii Kai.

The Board of Water Supply's 272' Punaluu System is presently adequate to serve the project's 195,000 gallon average daily demand and 585,000 gallon peak daily demand. However, a water master plan will be prepared to demonstrate the existing system's adequacy to supply the required peak flow, as well as maintain adequate pressure. The master plan will be prepared for review by the Board of Water Supply prior to subdivision approval.

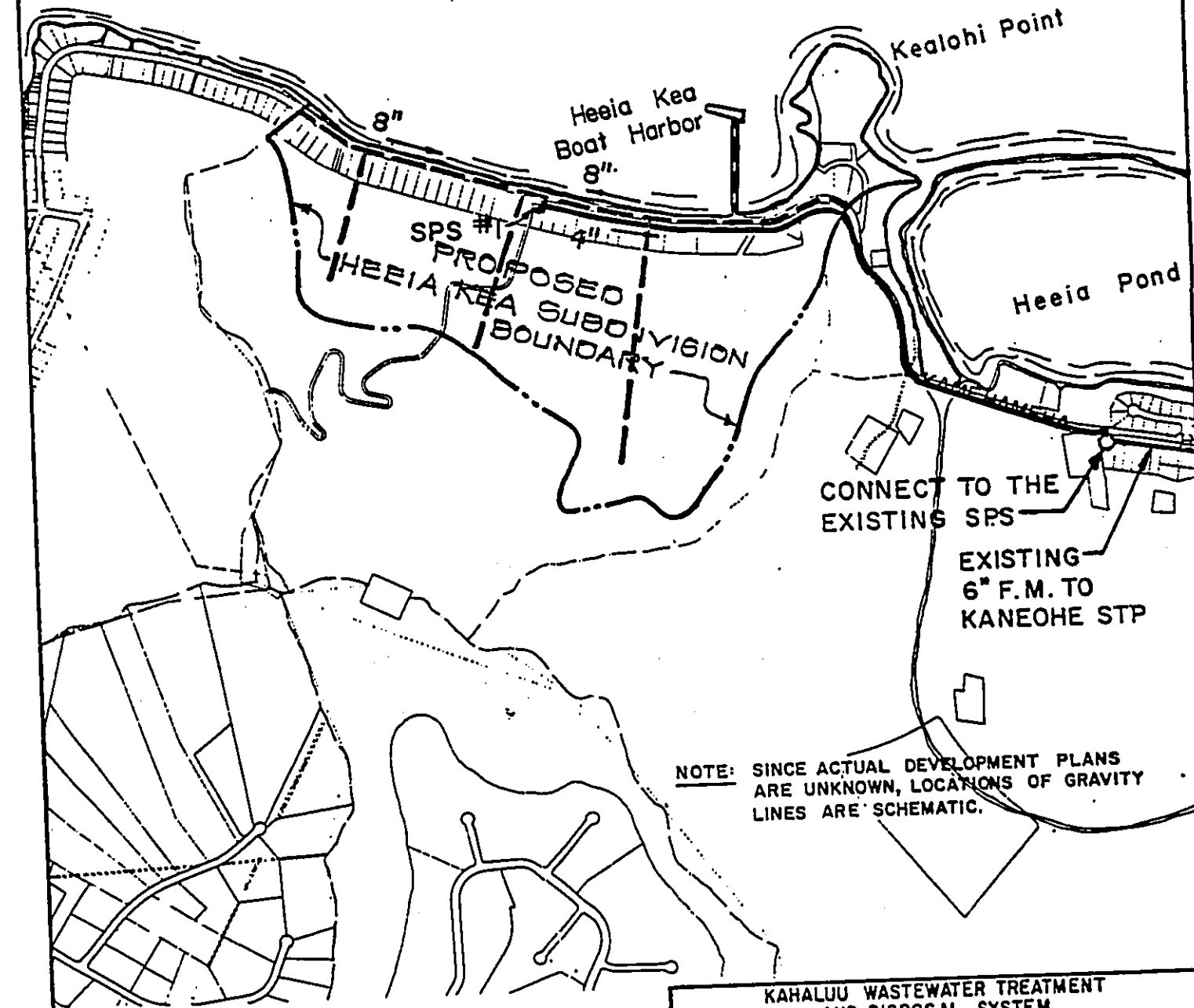
In any event, the Board of Water Supply will not provide a water commitment until construction plans are submitted for review and approval. As a part of any construction approval, a water development charge will be assessed to improve existing source and pipe line components of the Board of Water Supply's distribution system. The Board of Water Supply has indicated that a 0.3 MGD reservoir will

be required for the project and that no water development charges will be utilized for this item. The reservoir will be on-site at a 272-foot elevation or a part of another reservoir constructed elsewhere.

- e. Sanitary Sewer System Improvements. The only viable method of sewage collection and treatment for the Heeia Kea Subdivision is through connection to the City and County of Honolulu sewer system. Figures 8 and 9 show the City and County of Honolulu Department of Public Work's facility plans for two alternatives to serve the project area. It will be the decision of the City and County as to which alternative is appropriate. Consultation with the City and County during the EIS processing indicates that the alternative depicted on Figure 8 is preferred. In addition, the City has indicated that two permanent pump stations will be necessary to serve the project. One pump station would be located at the site of SPS No.1 of Figure 8 and the other would replace the existing pump station also identified on Figure 8.

All sewage from the Heeia Kea Subdivision was master planned to be treated at the Kaneohe Sewage Treatment Plant prior to ultimate disposal via the Mokapu Outfall. However, the City and County is

FIGURE 8



1000' 500' 0 1000' 2000'

SCALE IN FEET

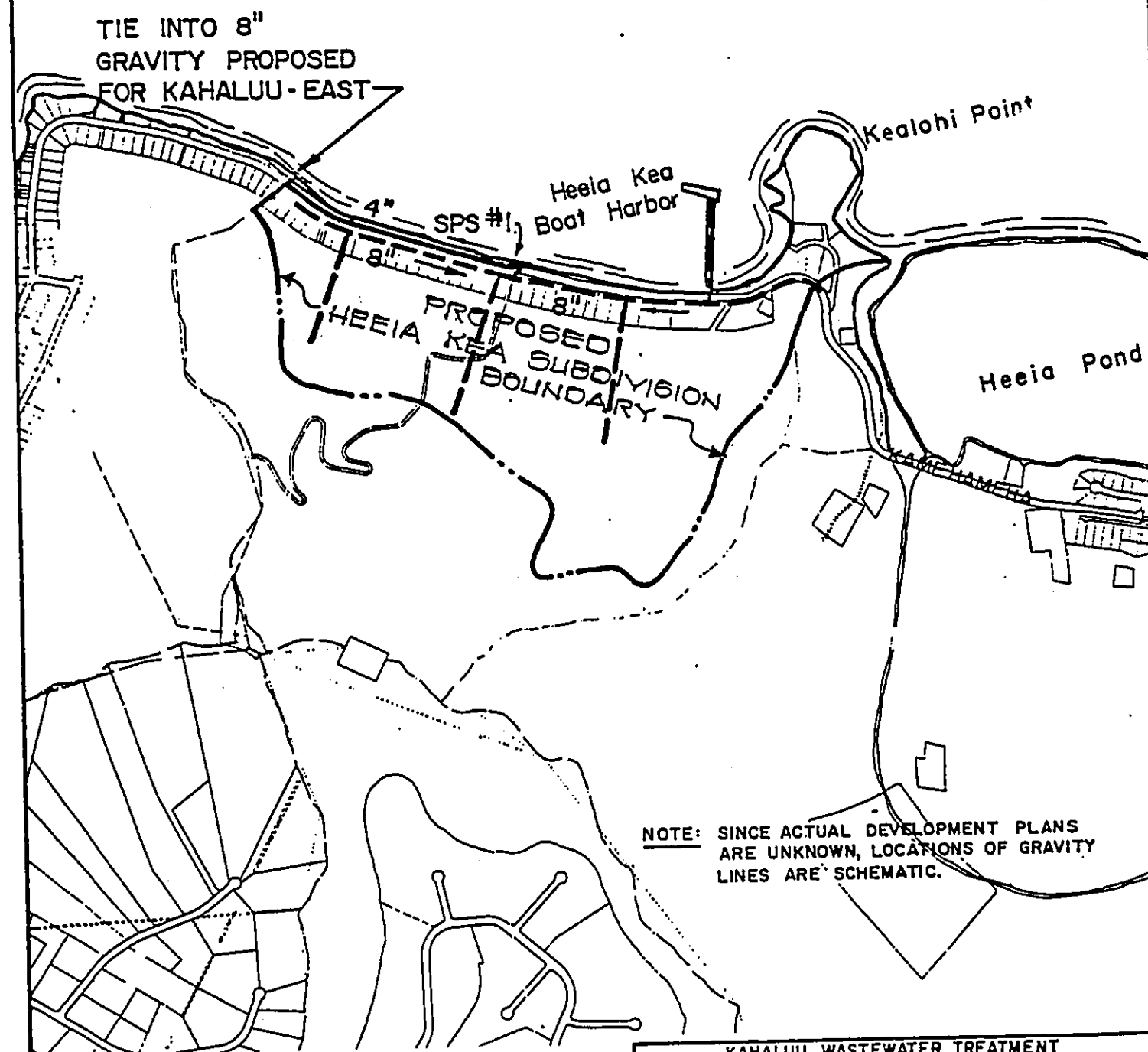
- FORCE MAIN (PROPOSED)
- - - GRAVITY LINE (PROPOSED)
- TRIBUTARY AREA
- SEWAGE PUMPING STATION (PROPOSED)

KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
PRELIMINARY ENGINEERING REPORT

FIGURE VI-8
HEEIA - NORTH SUBAREA
ALTERNATE #1

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

FIGURE 9



1000' 500' 0 1000' 2000'

SCALE IN FEET

- FORCE MAIN (PROPOSED)
- - - GRAVITY LINE (PROPOSED)
- TRIBUTARY AREA
- SEWAGE PUMPING STATION (PROPOSED)

KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
PRELIMINARY ENGINEERING REPORT

FIGURE VI-9

HEEIA - NORTH SUBAREA
ALTERNATE #2

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

presently evaluating the possibility of treating all sewage from the Kaneohe-Kailua area at one Wastewater Treatment facility located in Kailua. This study is scheduled for completion in mid-1983. If the one-facility option is selected, all sewage will be treated at Kailua in expanded facilities. If the two-plant option is selected, all sewage will be treated at an expanded Kaneohe Treatment Plant. Construction at either plant will begin in Fiscal 1984-85 and take approximately two years to complete. The design average and peak sewage flows for the total Heeia Kea Subdivision are 0.17 mgd and 0.97 mgd, respectively. All construction plans for facilities designed by the project's engineer will be submitted to the City and County Department of Public Works for approval.

- f. Electric and Telephone. Underground electric and telephone service will be provided to the Heeia Kea Subdivision. Connection to Hawaiian Electric Company's and Hawaiian Telephone Company's existing systems will be at Kamehameha Highway. Both Hawaiian Electric Company and Hawaiian Telephone will review and approve construction plans for underground service. The existing systems appear adequate, however, both utilities have long range

planning to accommodate this project if the existing system is inadequate.

- g. Landscaping. Landscaping within a residential subdivision is mainly dependent upon the preference of individual lot owners or lessees. The project is mauka of Kamehameha Highway and therefore, the view planes from any state highway will not be affected. Site improvements for the Heeia Kea Subdivision will require the planting of street trees along all of the subdivision's roadways. In addition, the private park within the project will be appropriately landscaped with a combination of shade trees, grassed lawns and hedges to provide park atmosphere and minimize noise to neighboring lots.

Street tree plans will be reviewed and approved by the City and County of Honolulu Department of Transportation Services and all park plans will be reviewed and approved by the City and County of Honolulu Department of Parks and Recreation.

2. Economic Characteristics

The proposed project will offer an additional supply of single-family lots to meet market demands and serve residents of Oahu. A marketing study by Cowell & Company, Inc. has been prepared (See Appendix B) to quantitatively demonstrate that single-family

residential housing is in demand even though most people would generally agree with this fact. The key points of the study indicate that the average price of a single-family home and lot has escalated from \$31,400 in 1967 to \$157,000 in 1981. Three of the key factors contributing to this rapid price escalation are (1) strong housing demand, (2) modest supply of residential land available for development, and (3) general inflationary factors. As discussed in the market study, First Hawaiian Bank, Research Division, recently published an article regarding "Hawaii's Unaffordable Housing". Major reasons stated for Hawaii's high cost housing were high site costs and lack of readily developable residential land.

It is important to note that the number of vacant single-family homes has not exceeded 0.6 percent since 1977. In addition, the number of new single-family units authorized for construction has dropped from 3,771 in 1971 to 768 in 1981. The conclusion of the study is that there will be a good to excellent demand for single-family residential units developed at Heeia Kea. In addition, development of the project will generate job opportunities in the construction industry. The creation of these jobs will enhance the economy of Windward Oahu as well as the Island in general. In addition, development of the project will generate jobs and cash flow in the construction industry.

The preliminary estimate of costs for subdivision improvements (grading, roadways, sewers, utilities and drainage structures) is approximately 9-11 million dollars. House construction will most likely be by individual lot owners or tract developers. The project will most likely be marketed on a fee simple basis, rather than leasehold. However, a final determination has not been made.

3. Social Characteristics

The residential nature of the development will create a suburban atmosphere typical to that of existing residential subdivisions located in the general area. No significant change in social characteristics of the area are anticipated. The children living within the Heeia Kea Subdivision will use the existing schools located in the area, the majority of working parents will commute to work and during non-working hours, the shopping, socializing and recreational needs of Heeia Kea Subdivision residents will be similar to that of other Windward Oahu residential areas.

There is some community concern that a project of this type may produce additional pressure to urbanize the surrounding area. However, the project site is along Kamehameha Highway which has a predominance of single-family homes characteristic of urban fringe. The ridge line mauka of the project provides a relatively

distinct boundary between the Kamehameha Highway urban fringe development and the surrounding area.

4. Environmental Characteristics

The proposed subdivision site is located on land composed of soils typical of Windward Oahu and suitable for residential development. There is no sandy beach, notable viewplane, or beach access which will be affected by the development. Based on literature review and field surveys, there are no rare, endangered, or unique plants or animals on any section of the site. The section of the property makai of Kamehameha Highway is covered mainly by hau trees, which are common in the State. The mauka section is mostly covered by haole koa, an introduced, shrubby tree which occurs as a weed in disturbed areas. The haole koa is interspersed with various other weeds and introduced ornamentals. There are some planted ornamental and fruit trees in the yards of the houses existing in the area.

The proposed project will connect to the City and County of Honolulu sewer system. Presently, sewage disposal in the area is by the use of cesspools. All other necessary infrastructure exists within Kamehameha Highway.

Drainage from the project site presently enters Kaneohe Bay and will continue to enter the Bay after development in much the same fashion.

Overall, the proposed project will enhance the Heeia Kea area. The existing structures situated on the mauka side of Kamehameha Highway are substandard and presently, the source of several building and zoning code violations. These structures will eventually be replaced by new housing units that meet City and County standards.

D. Use of Public Funds or Lands for the Action

No public funds or lands will be used for the project. Left turn storage lanes and acceleration-deceleration lanes on Kamehameha Highway will be constructed by the developer at the developer's cost. New roads will be created, both for public use and for Board of Water Supply access to the existing reservoir mauka of the site.

E. Phasing and Timing of Action

The actual phasing and timing for the construction of improvement is dependent on the state of the economy and other market conditions. Generally, though, it is anticipated that the total subdivision will be developed in approximately 3 to 5 phases over a period of 6 to 9 years. It is unlikely that construction could begin until 1984, or later.

F. Summary Technical Data

1. Foote et al. 1972. Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii. U.S. Department of Agriculture, Soil Conservation Service. U.S. Government-Printing Office, Washington, D.C.

2. Smith, S.V. et al 1981. Kaneohe Bay Sewage Diversion Experiment: Perspectives on Ecosystem Responses to Nutritional Perturbation. Pacific Science 35(4):297-402.
 3. General Plan, Objectives and Policies. 1982. City and County of Honolulu.
 4. Administrative Action Draft Supplement to the Interstate Route H-3 Environmental Impact Statement. U.S. Dept. Transportation and State of Hawaii, Dept. of Transportation. Report No. FHWA-HI-EIS-77-01-D(S). November 1977.
 5. Dugan, G.L. 1981. Environmental Aspects of Storm Water Runoff. Appendix D In Environmental Impact Statement for the Proposed Kahaluu Industrial Project Development, Gray, Hong & Associates, Inc, Honolulu.
 6. Fujiwara, T.D. 1973. Characteristics of Urban Stormwater Discharge from Separate Sewers. M.S. Thesis, Dept. Civil Engineering, Univ. Hawaii, Honolulu.
 7. State of Hawaii Data Book. 1981. Dept. of Land and Natural Resources, Honolulu.
 8. State of Hawaii Revised Statutes. 1978. Chap. 205-A. Coastal Zone Management Policies.
 9. A Policy on Geometric Design of Rural Highways, 1965, AASHO.
- G. Historic Perspective

Until about the 1930's, the site was in pineapple cultivation and during World War II, the military occupied the site for what appears to have been relatively intensive training for a Regimental Combat Team. Since World War II, the site has largely fallen into

disuse and become overgrown with weeds. There are a few substandard houses on the existing Heeia Kea residential lots adjacent to Kamehameha Highway. The lack of a permanent ground or surface freshwater supply and the terrain has inhibited use of the land for crops.

Housing demand has stimulated the expansion of new housing into urban fringe areas such as Heeia, Ahuimanu and Kahaluu. Existing land uses in the surrounding areas of the windward coast include a mixture of residential, industrial, commercial and small-scale agricultural uses.

III. THE RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA

A. State Land Use Designation

The State Land Use designation for the project site and the surrounding area is "Urban".

B. Hawaii State Plan

The Hawaii State Plan identifies the goals, objectives and policies of the State to serve as a broad guide for future development. The following are the objectives and policies of the Hawaii State Plan which are relevant to the proposed project and a discussion of how the proposed action relates to them.

1. Population

Section 5(b)1: "Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social and economic aspirations while recognizing the needs of each county."

The proposed development will provide housing choices for median-income families in an area already designated as "Urban" by the State General Plan and zoned for residential development by the City and County of Honolulu.

2. Economy

Section 6(a)6: "Strive to achieve a sustained level of construction activity responsive to, and consistent with, State growth objectives."

The proposed development will create construction job opportunities over a period of several years.

Section 6(a)15: "Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy."

No notable viewplanes, beaches, or beach accesses are to be sacrificed. Instead, an area overgrown with weeds and now sparsely developed with substandard houses will be converted to an attractive residential area.

Section 7(a)6: "Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs."

The proposed development does not conflict with this objective. The site does not have a permanent source of water supply and the land has an average slope of approximately 10 percent. Both of these conditions do not preclude agricultural development, however, these factors greatly decrease any realistic agricultural value.

3. Physical Environment

Section 11(b)3: "Take into account the physical attributes of areas when planning and designing activities and facilities."

Based on the topography and the availability of infrastructure, the proposed subdivision is economically viable. It is also a recognized fact that there is a strong demand for median-income single-family housing on Oahu.

Section 11(b)5: "Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions."

The proposed development site will be divided into residential development and preservation (approximately half and half) within the same watershed area. There will be no effect on groundwater recharge and no significantly adverse long term impacts on Kaneohe Bay Class AA quality are anticipated.

Section 11(b)6: "Encourage the protection of rare of endangered plant and animal species and habitats native of Hawaii."

There are no rare or endangered plants or animals on the proposed project site.

Section 11(b)8: "Pursue compatible relationships among activities, facilities, and natural resources, especially within shoreline areas."

The project site is located between the shoreline and conservation area, however, no work is proposed which will affect the activities of either of these areas. The proposed residential subdivision will be

compatible with existing residential areas in either direction on Kamehameha Highway. Developing the proposed residential lots on gentle slopes will take advantage of views to Kaneohe Bay and the ocean. The land is not presently used for agricultural purposes and the likelihood of using the site for agriculture is inhibited by the lack of water and the slope of the site.

Section 11(b)9: "Promote greater accessibility and prudent use of shoreline for public recreational, educational, and scientific purposes."

The shoreline facing the proposed development site consists of shallow mud flats and a small boat harbor. Residential development on the mauka section of the site will not hamper public access to the shoreline or the boat harbor.

Section 12(b)4: "Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage."

There are no significant archeological or cultural artifacts on the project site. An archaeological reconnaissance identified five sites, of which only one was considered of any value.

Section 12(b)5: "Encourage the design of developments and activities that complement the natural beauty of the islands."

No view planes will be sacrificed by the proposed development. Substandard houses and weeds will be replaced by an attractive residential development.

Section 13(b)2: "Promote the proper management of Hawaii's land and water resources."

The proposed development will not change surface water drainage patterns or significantly effect Kaneohe Bay water quality. The project will place an additional demand on the groundwater supply. However, it is generally observed that there are adequate reserves of groundwater resources for growth on Oahu.

Section 13(b)3: "Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters."

During the construction phase, appropriate and effective measures must be taken to ensure that sediments contained in runoff are retained on the site. After construction, the development should have a negligible effect on the quality of groundwater and coastal waters.

Section 13(b)4: "Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people."

A study of air quality impact from increased traffic on Kamehameha Highway has been conducted. The impact on air quality is negligible. Noise levels in residential area are not excessive. However, the site is near enough to Kaneohe Marine Corps Air Station that noise from the air station is heard. The average noise level is within the acceptable standard for residential areas.

Section 13(b)5: "Reduce the threat to life and property from erosion, flooding, tsunamis, earthquakes, and other natural or man-induced hazards, and disasters"

Proper drainage based on the City and County of Honolulu's Drainage Standards will be provided. The site is not in a coastal flood hazard area. The hazard due to tsunami or storm waves is minimal because the inner shoreline of Kaneohe Bay is protected by an extensive shoaling reef.

Section 13(b)7: "Encourage urban developments in close proximity to existing services and facilities."

The proposed development site is close to existing residential development. Infrastructure necessary to support the Heeia Subdivision already exists in Kamehameha Highway or it can be provided without using extraordinary means. Shopping centers and businesses are available in nearby Kaneohe and in Valley of the Temples on Kahekili Highway.

4. Facilities Systems

Section 14(b)3: "Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user."

As discussed above, the necessary facility systems (water, waste disposal, utilities) are already in existence or they can be readily provided.

5. Housing

Section 19(a)1: "Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, livable homes located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals."

The proposed development will primarily provide housing in the median-income price range which will be located in pleasant surroundings. Some low and moderate cost units will also be included in the project.

Section 19(a)2: "The orderly development of residential areas sensitive to community needs and other land uses."

The proposed development will be located in an area already zoned for residential development. It is in close proximity to existing residential development.

Section 19(b)2: "Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households."

The proposed development will promote housing choices for median-income families where the housing demand is greatest. Adding to the supply of median-income housing will open up housing in lower economic levels as purchasers sell or rent their existing residential units.

Section 19(b)3: "Increase home ownership and rental opportunities and choices in terms of quality, location, cost, densities, style and size of housing."

The proposed development will enhance the number of choices of housing available on Oahu and especially within Windward Oahu. This specific project has been endorsed by the Department of Housing and Community Development (see DHCD's letter in Section XIII).

6. Leisure

Section 23(b)4: "Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values."

No area of significant recreational or educational potential will be sacrificed.

C. Oahu General Plan (City and County of Honolulu)

The 1982 Oahu General Plan designates the subdivision site as urban fringe. The existing Detailed Land Use Map (DLUM) designates the proposed subdivision site as residential (see Figure 10). However, the currently proposed Koolaupoko Development Plan (see Figure 11) designates the site as residential along the highway and agriculture behind the existing residential lots in spite of topographical and fresh water deficiencies of the site. The following discusses the portions of the 1982 Oahu General Plan which are relevant to the proposed development.

1. Population

Objective A(4): "Seek to maintain a desirable pace of physical development through City and County regulations."

There is a demand for housing on Oahu and the proposed project can be implemented within the framework of existing City and County Regulations. No extraordinary regulations, such as rezoning or variances are necessary.

2. Economic Activity

Objective C(5): "Maintain agricultural land along the Windward, North Shore, Waianae coasts for truck farming, flower growing, aquaculture, livestock production, and other types of diversified agriculture."

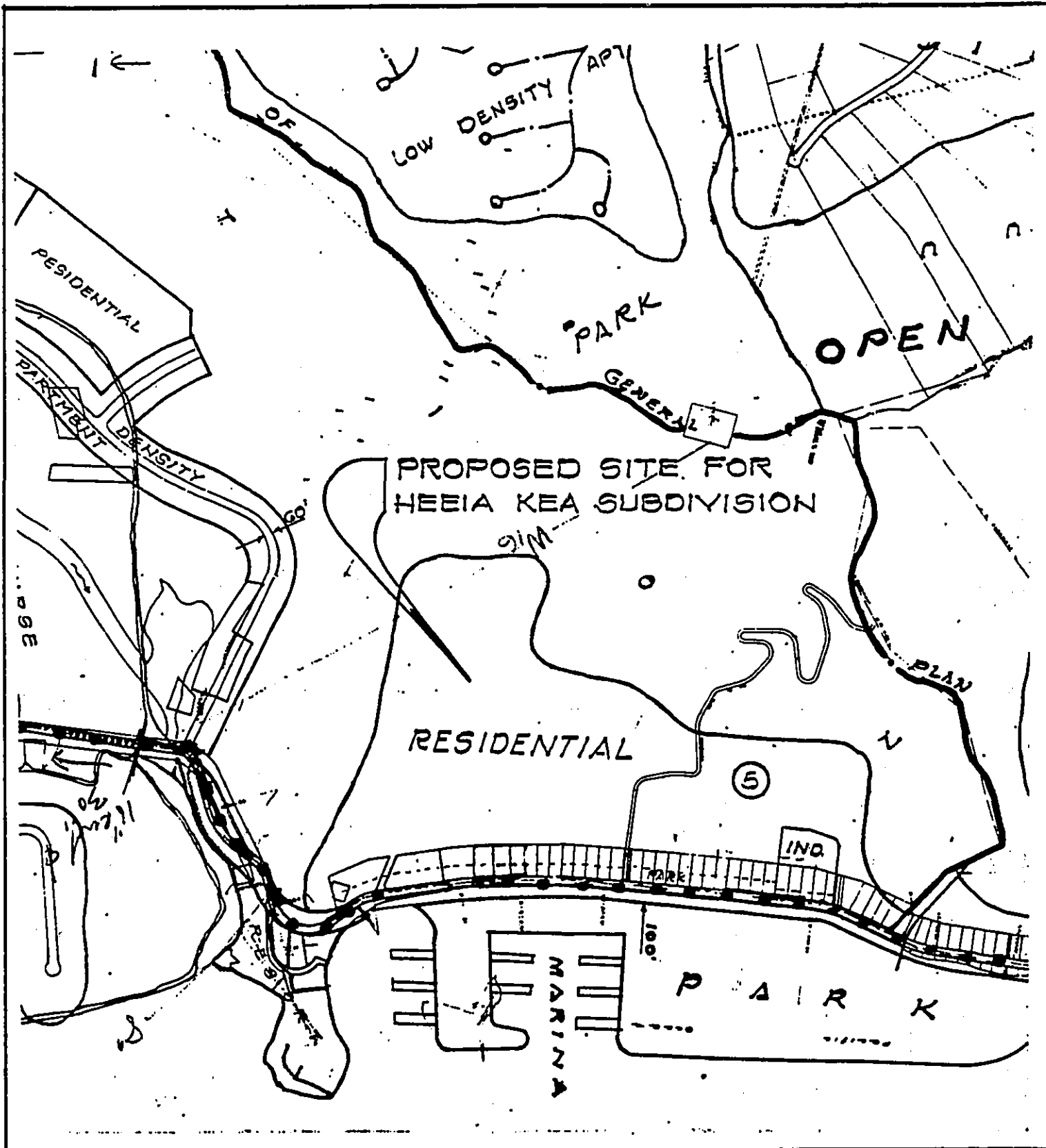


FIGURE 10
DETAILED LAND USE MAP
FOR HEEIA KEA AREA

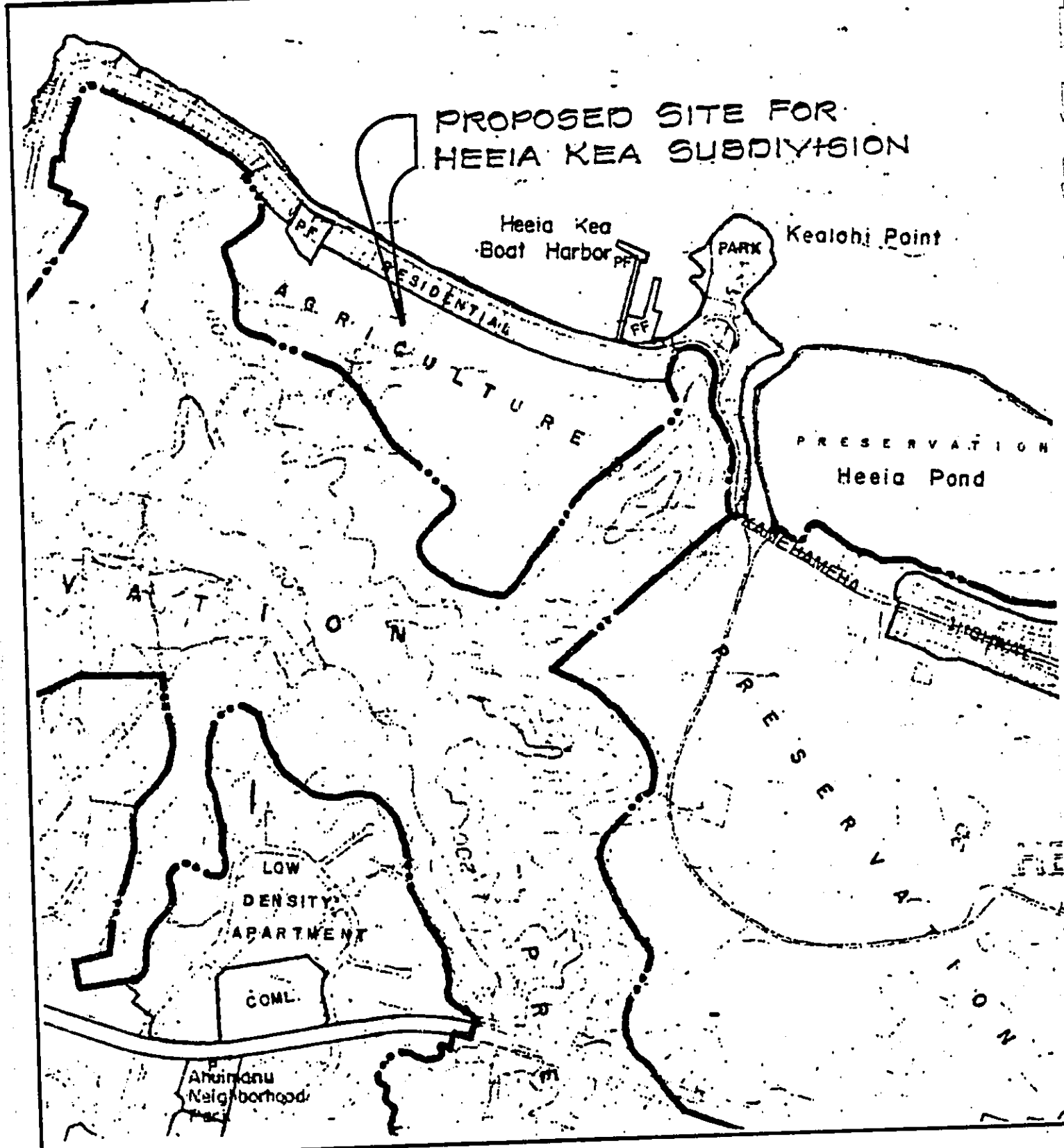


FIGURE 11

PROPOSED DEVELOPMENT PLAN
FOR HEEIA KEA AREA

Since the water resources and slope of the proposed development site are inhibiting for agricultural purposes, its development will not conflict with this objective.

3. Natural Environment

Objective A(1): "Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development."

The proposed development will not involve the adjacent shoreline. The conservation portion of the property which steeply rises to the ridge line will also not be developed.

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

The slope of the site is suitable for residential development. There are no flood or erosion hazards associated with its development. The area is not a water recharge area.

Objective A (6): "Design surface drainage and flood-control systems in a manner which will help preserve their natural settings."

There will be no significant change in the natural drainage pattern or the existing drainage structures at Kamehameha Highway. Surface drainage will remain in the preservation area above the project.

Objective A (7): "Protect the natural environment from damaging levels of air, water, and noise pollution."

Based on air, water quality and noise analysis prepared in conjunction with this document, no damaging effects are anticipated. The proposed site is exposed to noise from the Kaneohe Marine Corps Air Station, however, the project site complies with federal noise limitations for aircraft.

Objective A (8): "Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu."

There is no unique biota on the site.

Objective B (2): "Protect Oahu's scenic views, especially those seen from highly developed and heavily travelled areas."

No scenic views will be eliminated.

Objective B (3): "Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea."

No major highway changes are proposed. Utilities for the proposed subdivision will be underground. The development will not obstruct the view of Kaneohe Bay from Kamehameha Highway, however, the project will make a view of the Bay possible for residents of the subdivision.

4. Housing

Objective C (1): "Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes."

The project will create 389 lots primarily aimed for a working class, middle-income housing group. By

increasing the supply of much needed single-family housing units, the availability of housing units for lower level economic groups will also be increased as buyers in the proposed project will typically sell or rent their existing units to others. It is a recognized fact that most home buyers continually strive to increase their housing standards as their income levels rise or their family expands. By providing new housing unsubsidized by government at the middle income levels, the supply of housing at lower economic levels is opened up through market forces without costly government subsidies. Some low and moderate cost units will also be included in the project.

Objective C (4): "Encourage residential development in areas where existing roads, utilities, and other community facilities are not being used to capacity."

Existing utilities are adequate with the exception of sewers. Sewers can be provided in accordance with existing master planning. Kamehameha Highway, fronting the project can accommodate additional traffic, but areas more remote from the project site, such as the Kahekili-Likelike intersection are already congested. However, projects such as H-3 or TH-3 will help alleviate traffic congestion.

5. Transportation and Utilities

Objective B (5): "Provide safe, efficient, and environmentally sensitive waste-collection and waste-disposal services."

The proposed development will connect to the City and County sewer system.

Objective C (3): "Plan for the timely and orderly expansion of utility systems."

The majority of utilities necessary to support the project already exist with the exception of sewer. However, the sewer system is planned and its installation does not require an unorderly or untimely expansion.

Objective D (5): "Require the installation of underground utility lines wherever feasible."

Utility lines will be installed underground.

6. Physical Development and Urban Design

Objective A (6): "Encourage the clustering of developments to reduce the cost of providing utilities and other public services."

The proposed subdivision site is located near other similar developments and existing utilities.

7. Culture and Recreation

Objective B (1): "Encourage the restoration and preservation of early Hawaiian structures, artifacts and landmarks."

There are no significant early Hawaiian artifacts or landmarks on the site. An archaeological reconnaissance located five sites on the property, however, only one site is of any value.

Objective B (4): "Provide convenient access to all beaches and inland recreation areas."

The proposed development will not hinder access to any beaches or inland recreational areas.

D. Zoning - City and County of Honolulu

The proposed subdivision site is currently zoned R-6 residential. No change of zoning is necessary for residential development of the project site. The rear mauka section will remain in P-1 preservation with no proposed development.

E. Special Management Area

A small portion (2 acres) of the proposed 87+ acre subdivision site is located within a Special Management Area (see Figure 12). A Special Management Area Use Permit (SMP) is required prior to subdivision approval and construction. In compliance with Ordinance No. 4529, an accepted EIS which addresses the significance of the proposed project will be submitted concurrently with the Special Management Use Permit application.

F. Hawaii Coastal Zone Management (CZM) Program

The objectives of the Hawaii Coastal Zone Management Program (Chapter 205A, Hawaii Revised Statutes) are to protect valuable and vulnerable coastal resources, such as coastal ecosystems, special scenic and cultural values, and recreational opportunities. They are also intended to reduce coastal hazards, to provide for coastal-dependent economic uses and to improve the review process involving development activities.

No improvements of the proposed project will be done within the shoreline setback, as defined by the Special Management Area setback requirements.

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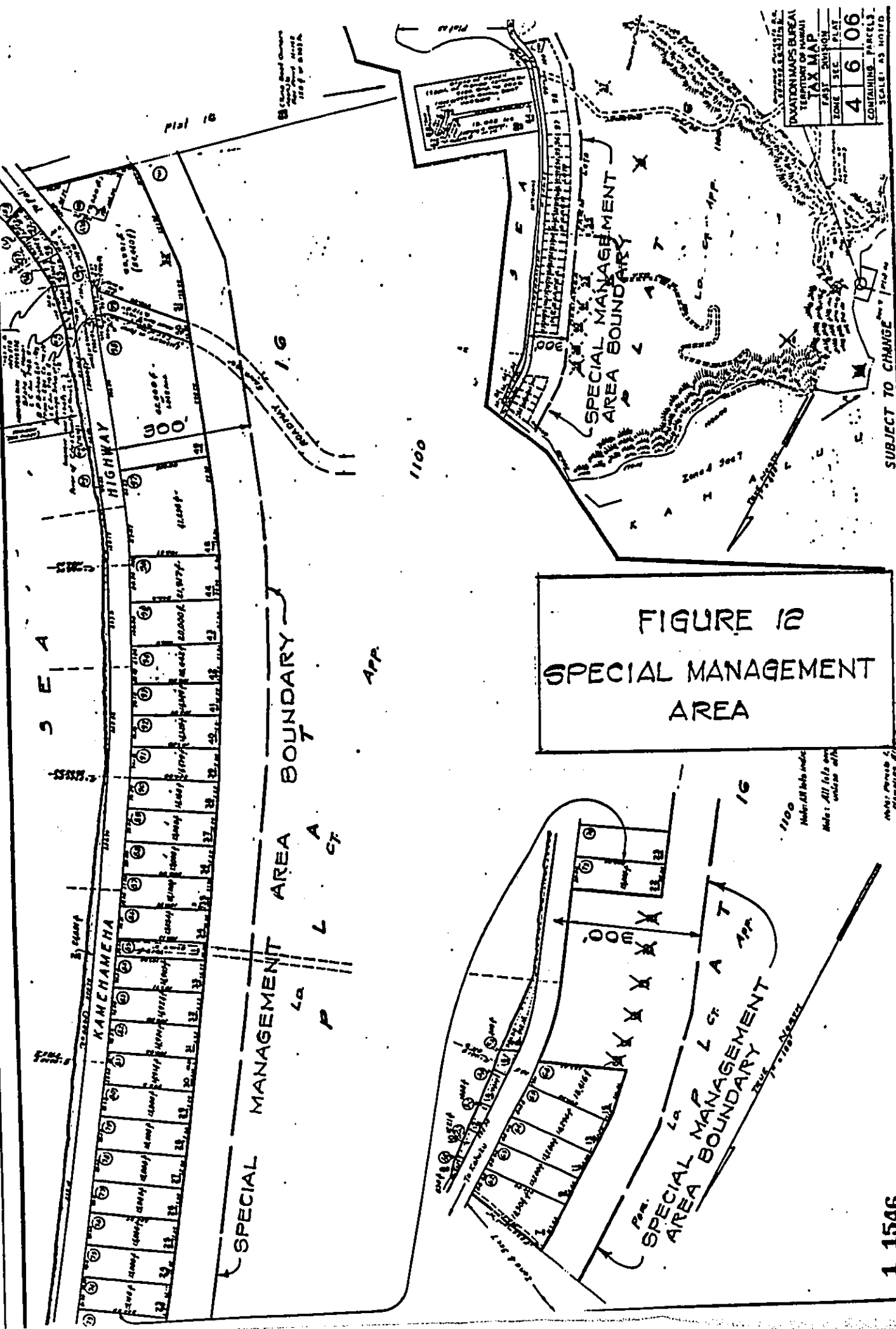


FIGURE 12
SPECIAL MANAGEMENT
AREA

1 1546
POR. HEEIA, KOOLAUPOKO, OAHU

SUBJECT TO CHANGE

The following are the objectives of the Hawaii Coastal Zone Management Program which have some relevance to the proposed project:

1. Recreational Resources

"Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area."

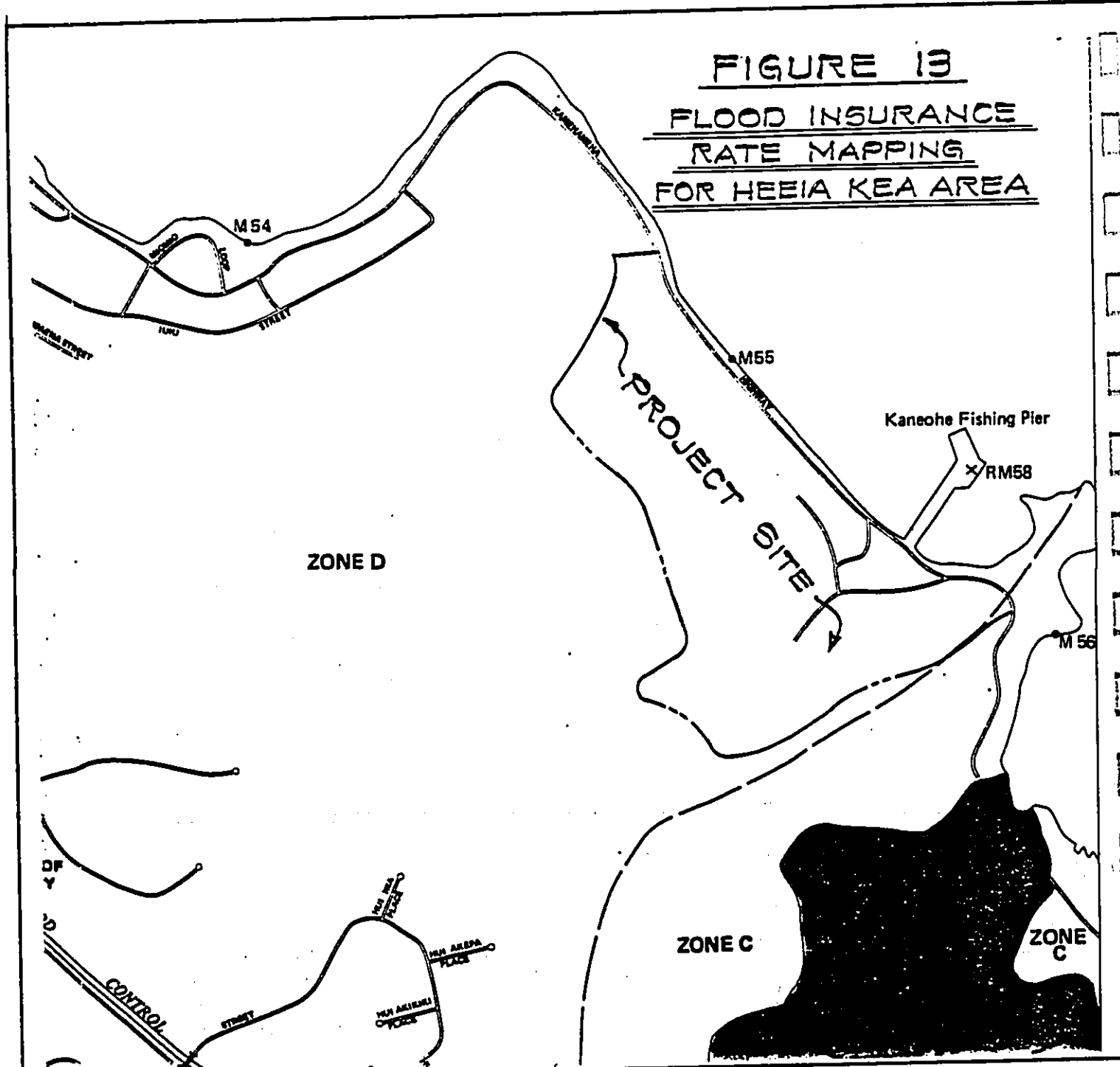
Recreational activities normally associated with the shoreline are bathing, swimming, beaching and boating. There is a small boat harbor adjacent to the southern end of the makai section of the property. The proposed development will not interfere with its operation. The rest of the shoreline consists of a narrow beach and shallow mudflats which are unsuitable for the above-mentioned recreational activities, with the exception of crabbing, netting and fishing. However, the project will not inhibit or infringe on any potential use of the shoreline.

2. Historic Resources

"Protect, preserve, and where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture."

An archaeological reconnaissance (Appendix C) of the project site was conducted. Five sites were located of which three were terraces/mounds and two were religious in nature. Only one of the five located sites appears to have any value. Due to military training

FIGURE 13
FLOOD INSURANCE
RATE MAPPING
FOR HEEIA KEA AREA



***EXPLANATION OF ZONE DESIGNATIONS**

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

operations during World War II and pineapple cultivation in the early 1900's the likelihood of encountering additional above ground features is small. It is the recommendation of the archaeologist to have grubbing and earthwork activities monitored as a precaution should subsurface features be encountered.

3. Scenic and Open Space Resources

"Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems."

Negligible long term water quality impact is anticipated based on the size of the project relative to the Kaneohe Bay watershed. The short-term impact could possibly result in some damage and therefore, it is imperative that temporary erosion controls be strictly followed.

4. Economic Uses

"Provide public or private facilities and improvements important to the State's economy in suitable locations."

The proposed action is consistent with the present land use designation and zoning for the site. In addition, the project will contribute to the economy by providing jobs and revenue within the community during construction, by providing cash flow in the surrounding business community, and by providing housing alternatives on Oahu, where there is an acknowledged housing shortage.

5. Coastal Hazards

"Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, and subsidence."

The project will be designed and constructed in compliance with the requirements of the City and County of Honolulu Drainage Standards. As indicated on Figure 13, the project site is located within Zone D of the Flood Insurance Rate Map. Zone D indicates areas of undetermined, but possible flood hazard. However, a drainage report will be prepared and submitted to the City and County of Honolulu Department of Public Works for review prior to the submission of a Special Management Permit application. Preliminary drainage calculations indicate that surface drainage can be handled by conventional methods and that existing outlet structures into the Bay have adequate capacity.

The project site is not within Zone V, which confirms that the area is not subjected to coastal flooding or wave hazard. Although the site is adjacent to Kaneohe Bay, fringing reefs prevent the major damage associated with tsunamis and storm waves.

6. Managing Development

"Improve the development review process, communication, and public participation in the management of coastal resources and hazards."

This EIS was written to communicate the potential impacts of the proposed project in order to facilitate

public participation in the review of coastal resources and hazards.

IV. DESCRIPTION OF THE ENVIRONMENTAL SETTING AND THE PROBABLE IMPACT OF THE PROPOSED ACTION

A. Physical and Chemical Characteristics

1. Physical Geography

Windward Oahu generally consists of the steep cliffs of the Koolau Mountain Range, which flatten to the coastal plains adjacent to Kaneohe Bay. The project site is located adjacent to Kaneohe Bay on coastal plains consisting of alluvial deposits. The average slope of the proposed subdivision site is approximately 10 percent. The slope increases mauka of the subdivision site to as much as 40 percent and rises to a ridge line which varies in height between 500 and 600 feet. The entire property (mauka and makai sections) comprises a self-contained watershed with four subbasins. Drainage is by overland flow that ultimately discharges into Kaneohe Bay by way of four existing culverts passing under Kamehameha Highway. There is no permanent stream on the property.

The project's technical description identified that 250,000 cu. yds. of earthwork are required, the area to be graded is 50 acres and that the deepest cut or fill is approximately 15 feet. The proposed earthwork will not have a direct adverse impact on the physical

characteristic of the site. However, the indirect impact on water quality of Kaneohe Bay will be discussed later.

The project's technical description has identified that drainage within the subdivision will be collected by catch basins and field inlets and transported makai to the existing culverts discharging into Kaneohe Bay. In addition, stormwater runoff from the preservation area will be diverted into the subdivision's storm drainage system at the subdivision's mauka border. The proposed drainage system is conventional in nature and will not have any adverse impact on the existing drainage patterns. However, as with grading, the indirect impact on water quality will be discussed later.

2. Soils

The soils of the Koolau coastal plains generally consist of the Kaena-Waiialua and Lolekaa-Waikane soil associations. The soils on the subject property belong to the Kaena-Waiialua association. This association is described by Foote et al (1972) as "Deep mainly nearly level, and gently sloping, poorly drained to excessively drained soils that have a fine-textured to coarse-textured subsoil or underlying material; on coastal plains and talus slopes and in drainage ways." From mauka to makai the soils on the subject property are:

- a. Alaeloa Silty Clay. Comprises about 55% of the property, with almost all of it in the portion designated at P-1 Preservation. This soil is listed as suitable for woodlands, pasture and wildlife. The permeability is moderate and the erosion hazard is also moderate where the slope is less than 35%.
- b. Lahaina Silty Clay. Comprises about 35% of the property. Most of the proposed subdivision lies on this soil. It is a Tropeptic Haplustox (Low Humic Latosol) with moderate permeability, medium runoff, and moderate erosion hazard. It is considered suitable for most purposes, including house sites.
- c. Ewa Silty Clay. Comprises a narrow strip of the proposed development site (less than 10%) along Kamehameha Highway. It is a Torroxic Haplustoll (Low Humic Latosol) and has moderate permeability, slow runoff, and slight erosion hazard. It is also considered suitable for most purposes, including house sites.

As detailed above, the soils on the development site are suitable for residential subdivision and the erosion hazard is moderate to low. However, a soils engineering report will be prepared to specifically analyze the site. This report will be utilized in the design of all site improvements. Construction will take

place on all of the above-mentioned soil types except the Alaeloa silty clay, which is within the preservation portion of the property. The soils on the site presently support a vegetation cover composed mainly of introduced weeds. This vegetation cover will be destroyed in the preliminary construction phase and ultimately replaced by landscaping.

Proposed grading and installation of utilities and roadways will have no direct adverse effect on the soils of the area. However, soil loss during periods when vegetation is removed and soil is exposed can potentially be washed away by surface runoff and create an indirect adverse impact on water quality.

3. Surface Water Quality

The existing site which is proposed for a residential subdivision is mainly overgrown with vegetation. A few substandard residential houses and the Hawaiian Electric Company Base Yard are located at the project's lower boundary adjacent to Kamehameha Highway. Under existing conditions, the site affects the surface water quality of Kaneohe Bay when there is sufficient rainfall to produce stormwater runoff which discharges into the Bay via four (4) existing drainage structures. During dry weather conditions when no runoff is produced, the site has little or no effect on Kaneohe Bay water quality.

The natural effect of runoff regardless of any type of development is a short term stress period within Kaneohe Bay where sediments are deposited near the shoreline, turbidity increases, nutrient loadings are increased and salinity is depressed. The amount of stress caused by runoff and its impact has been occasionally quite severe. A fish kill within Kaneohe Bay in 1965 was attributed to salinity depression from a high intensity rainfall. However, the effects of naturally occurring rainfall events are generally short. The central portion of Kaneohe Bay adjacent to the project site has a complete tidal exchange once every 5 to 8 days and water quality characteristics typical of periods when no runoff occurs reappear in approximately this time period. The sedimentation that occurs at the shoreline with time creates shoals.

The water quality of Kaneohe Bay is classified Class AA except for small boat harbors, such as the Heeia Kea Small Boat Harbor adjacent to the project site. The small boat harbor water quality classification is Class B. Class AA waters are afforded the maximum protection to ensure minimum pollution from any source. Class B waters have been established to protect uses such as small boat harbors and ensure that sewage and industrial effluents receive the best degree of treatment control practicable under existing technology.

The proposed Heeia Kea Subdivision will not change the existing conditions, i.e. the only time the project site will effect Kaneohe Bay is during periods when runoff is produced. During these periods of runoff, the 102 acre urbanized portion of the project will increase the total runoff volume by approximately 15 percent (refer to Figure 7 - Preliminary Hydrologic Map). However, the total watershed area in which the project is located contains 220 acres of the total 22 square mile Kaneohe Bay Watershed. Therefore, the 15 percent runoff increase from the project's watershed area also represents 0.1 percent increase to the total Kaneohe Bay Watershed runoff. The impact to Kaneohe Bay is considered negligible. The impact is further diminished when it is recognized that during the periods when the project area produces stormwater runoff, the Bay will be under considerable stress from all other runoff from the Kaneohe Bay Watershed.

Based on the available literature, runoff from unurbanized areas may generally contain 0.74 mg/l (nitrogen-N), 0.07 mg/l (phosphorus-P) and 1300 mg/l suspended solids. Residential runoff has been characterized as having 0.38 mg/l (nitrogen-N), 0.57 mg/l (phosphorus-P) and 252 mg/l suspended solids. The foregoing values are not absolute, but are indicative of trends. As such, these values indicate nitrogen and

suspended solids loadings will be approximately the same or lower as under existing conditions and the phosphorus loading will be higher. However, the combined impact of all loading increases or decreases is expected to be proportional to the increase in runoff to Kaneohe Bay or approximately 0.1 percent.

Kaneohe Bay is an estuary and as such, the addition of nutrients through stream discharge and surface runoff is one of the elements forming the balance in the estuary system. The ecosystems which survive within an estuary by nature are adaptable to rather significant short-term stress periods even under pristine conditions. After construction is completed, the project is expected to have negligible effect on Kaneohe Bay since during dry weather periods no discharge will occur and during wet weather periods the discharge will not be significant based on the total discharge to the Bay. However, during construction and particularly during earth moving activities, the project site's impact on Kaneohe Bay can be potentially significant if no temporary controls are established. Based on the fact that there is a substantially increased likelihood for soil loss leading to Kaneohe Bay degradation, temporary erosion control measures to capture sediments must and will be used to minimize the short term impact. The use of temporary erosion control measures has

evolved along with a general concern for the environment. In prior years (1960's) when less attention was paid to the environment, Kaneohe Bay was subjected to substantial short term sedimentation resulting from large scale construction and the lack of erosion control features. The factors which allowed significant impact to the Bay in the 1960's are not present in the 1980's. However, it is imperative that temporary erosion control features including filter berms, sedimentation traps and ponds be effective at retaining soil during earthwork activities. In addition to the potential adverse effects on water quality discussed above, the proposed project also has beneficial effects. The single most beneficial effect will be the elimination of the use of cesspools in the area adjacent to Kaneohe Bay. One of the primary reasons for the City and County of Honolulu's Sewer Facility Plans (see Figures 8 & 9) is the elimination of potential Kaneohe Bay water quality degradation resulting from cesspools. The only way in which this area will be sewerred in the near future will be as a result of a project of this size which has the ability to share a substantial portion of the City's cost for providing sewers. The distance to a suitable City sewer connection point is near enough that the economics are feasible.

4. Groundwater Quality

The project site is makai of the Board of Water Supply's "no-pass" zone and groundwater below the site is not a source of potable water. There is no existing impact to groundwater quality nor will the proposed subdivision create any new impact.

5. Air Quality

Due to the fact that there are no upwind activities generating pollutants for thousands of miles, it is reasonable to assume that present air pollution levels are very low. Natural pollution in the form of sea spray, aero-allergens, dust and perhaps a distant volcanic eruption should be fairly uniform for most of Windward Oahu.

State of Hawaii and Federal Ambient Air Quality Standards (AQS) have been established for seven classes of pollutants. Primary standards have been established to prevent adverse health impacts while secondary standards have been established to prevent decreased visibility, diminished comfort levels, damage to vegetation, animals or property, or a reduction in the overall aesthetic quality of the atmosphere. The State's AQS are generally more stringent than Federal AQS. (For a complete listing of Primary and Secondary AQS, see Appendix D.)

The only long term monitoring site within windward Oahu is located at Waimanalo (12 miles away) and this station only measures particulates. The nearest stations which monitor the remaining pollutants are all located in Leeward Oahu. Even though these leeward monitoring sites are located in highly urbanized areas, the levels of hydrocarbons, ozone, particulates, sulfur dioxide and nitrogen dioxide are all within AQS. The only pollutant which sometimes exceeds the more stringent State AQS within leeward Oahu is carbon monoxide at locations of high vehicular traffic density. Since carbon monoxide levels are affected by vehicular traffic, the impact of new or proposed traffic generating development should be examined for this impact. Accordingly, a carbon monoxide modeling study was conducted for the project and this study is contained in Appendix D. Based on worst case analysis and complete development of the proposed project, the predicted carbon monoxide concentrations are well below the more stringent State of Hawaii AQS. Therefore, no significant impact on air quality is predicted for the project and no direct mitigation measures are proposed with respect to automobile emissions.

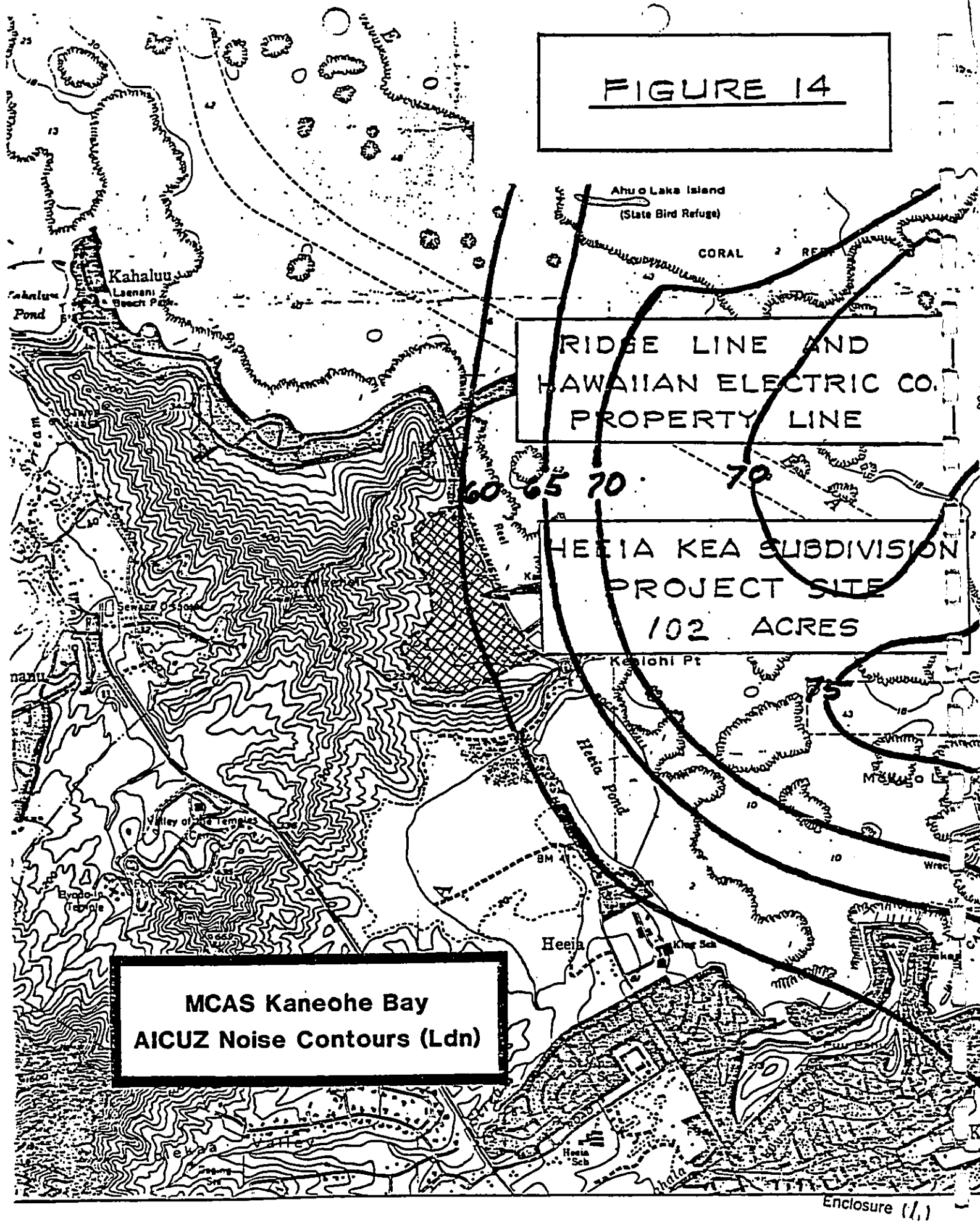
During construction, a temporary short term air quality impact can result from fugitive dust created during earthwork activities. Most fugitive dust is

created by heavy construction equipment moving over unpaved roadways. In addition, heavy equipment also generates air pollution in the form of engine exhausts. Both types of construction related air quality impacts are subject to City and County as well as State regulatory controls. The amount of short term construction related air quality deterioration is anticipated to be within regulatory limits.

6. Noise

At present, noise levels in and near the project site are low for a majority of the time. However, the project site is near enough to Kaneohe Marine Corps Air Station so that periodically the project is exposed to aircraft noise. Figure 14 illustrates the location of the project with respect to noise contours of the updated but unreleased 1976 Air Installation Compatibility Noise Zone (AICUZ) study. The currently recognized limit for noise is Ldn 65 dBA contour, however, some acoustical experts feel that the Ldn 60 dBA contour is more appropriate for Hawaii's outdoor lifestyle and house construction. The project site is outside the Ldn 65 dBA contour, but is bisected by the Ldn 60 dBA contour. It should also be noted that the contours shown on Figure 14 represent an average noise level and when aircraft pass nearby, the noise level can be as high as 80 dBA for short durations.

FIGURE 14



**MCAS Kaneohe Bay
AICUZ Noise Contours (Ldn)**

**RIDGE LINE AND
HAWAIIAN ELECTRIC CO.
PROPERTY LINE**

**HEEIA KEA SUBDIVISION
PROJECT SITE
102 ACRES**

Enclosure (1)

The State of Hawaii also has noise regulations for residential areas. Chapter 43 of Public Health Regulations indicate maximum noise levels of 55 dBA for daytime hours and 45 dBA for nighttime. These regulations, however, only apply to stationary sources and do not govern aircraft noise.

The impact of noise on the project can be a nuisance and cause irritation to some people even though the noise levels fall within the current standards. Appropriate disclosure regarding anticipated noise levels and the possible use of additional sound installation are methods to control noise.

In addition to aircraft noise, the project can generate higher noise levels during construction. However, noise levels must meet State and OSHA standards. Certain activities such as earth-moving are not allowed during weekends or during nonworking hours. The project by itself should not substantially increase ambient noise levels. It is anticipated that the noise level will be similar to other Windward urban areas. The State of Hawaii Data Book (1981) indicates that both Kailua and Kaneohe noise levels do not exceed 55 decibels more than 10 percent of the time. This noise level or lower is anticipated within the project.

7. Climate

The climate is typical of coastal, windward Oahu. Temperature normally varies between about 73 and 80° F. Average rainfall is 44 inches per year. The proposed subdivision will have no impact on climate.

8. Agriculture

The site under its existing condition does not support agriculture, however, 46 acres within the valley are listed as Agricultural Lands of Importance to the State of Hawaii (ALISH). Of this 46 acres, 25 acres are within the R-6 residential district and 21 acres are within the P-1 Preservation district.

Dr. Frank S. Scott, Jr., Ph.D., has prepared an agricultural feasibility study of the site which is presented in full in Appendix E. The study lists six soil subseries which exist on the site, however, only 40 to 45 acres near the makai portion of the project have soils suitable or adaptable for agriculture. The soil type in this area is Lahaina silty clay. The study further indicates fair to good production of orchard crops could be anticipated and only fair production of truck crops. Shade house production of potted flowers and foliage has not been recommended because of the need for costly terracing to provide level strips of land.

However, just being able to grow a crop does not necessarily mean that crop production is feasible. Five

criteria have been cited to establish feasibility.

These are:

1. Ecological Adaptation
2. Market or sales potential
3. Profitability
4. Comparative production advantage to competitors.
5. Intensity of production as determined by the magnitude of net income per acre.

Of the five criteria referenced above, the 40-45 acres containing Lahaina silty clays do not fulfill the last four criteria. Production costs would be high due to steeper terrain and water must be provided by the City and County.

Another factor to consider in evaluating the feasibility of agriculture on the site is the fact that the amount of prime agricultural land on Oahu far exceeds the amount which would be needed for intensive crop production in the foreseeable future. Lands which are better adapted to agriculture than those in the project area should receive priority in development to satisfy future demands for increased crop production. The 40-45 acres within the project site are only marginally suitable for crop production.

B. Biological Characteristics

1. Flora

As described in the Flora Report (Appendix F), there are no unique, rare or endangered plants on the proposed subdivision site. The makai section is mainly

covered by hau and hala trees, interspersed with some tropical almond, coconuts and haole koa. Hau and hala are trees native to Hawaii, but they are common plants in the State. The mauka section is covered mainly by introduced weed species such as haole koa, java plum, and Christmas berry. There are cultivated species introduced by man near the highway. No native plants exist on the slopes at the rear of the property.

Subdivision development will have no adverse impact on native Hawaiian plants. The complete vegetation survey, conducted by Dr. Charles H. Lamoureux, is attached as Appendix F.

2. Fauna

As reported in Dr. Andrew J. Berger's Fauna Report (see Appendix G), the fauna on the proposed development site consists solely of introduced species of which many are pests to man. There is no suitable habitat on the site for any endemic Hawaiian animals. There will be no adverse effect on native Hawaiian animals from development of the site.

C. Cultural Factors

1. Land Use

Presently, the only land use is for a few house sites near Kamehameha Highway and for a waste repository, such as old car bodies. Development of the site will not jeopardize any significant use of the

land. Agricultural use has been reported as only marginally viable for the site.

2. Archaeological and Historical Resources

An archaeological reconnaissance was conducted on the site between the period of October 7 and October 22, 1982. Additional time was devoted to a literature review and interviews to collect all known information regarding the site. The reconnaissance was performed by Archaeological Consultants of Hawaii and the complete report of this work is contained in Appendix C.

Five sites are located on or near the R-6 residential portion of the project. Three of the sites are terraces and two of the sites are identified as religious structures. The terraces appear to have been used for agricultural purposes. In their present state, these terraces/mounds are of little archaeological consequence and are unlikely to provide much additional useful archaeological information. The same is true for one of the two religious structures. However, the one remaining religious structure is cited as a nice example of the type of shrine that once was a frequent sight in ancient Hawaii under the kapu system. It has been suggested that thought be given to restoration and or preservation if this site is within the development boundary. It is also recommended that an archaeologist be present to monitor land clearing and grubbing since

there is a possibility that subsurface features may exist.

From a historical perspective, there is very little written information available on Heeia Kea. The archaeological reconnaissance performed in conjunction with this document may, in fact, be the only compilation of information on the site. However, based on review of an early map made by Alexander and Baldwin, a great deal of the land was devoted to pineapple cultivation between the early 1900's through the 1930's. Military records indicate that \$274,000 was spent to construct camp facilities for one Regimental Combat Team during World War II. After the war, small family sized dwelling units reappeared on the property near Kamehameha Highway and the property appears to have been occupied in this fashion to the present. The only addition has been the unauthorized dumping of junk cars and other refuse.

The presence of pineapple production and what appears to be extensive military activity have substantially reduced the likelihood of uncovering substantial above ground archaeological features. This statement is supported by the fact that all five sites located during the reconnaissance are located at the fringes of the flatter portion of the project.

3. Aesthetics and Viewplanes

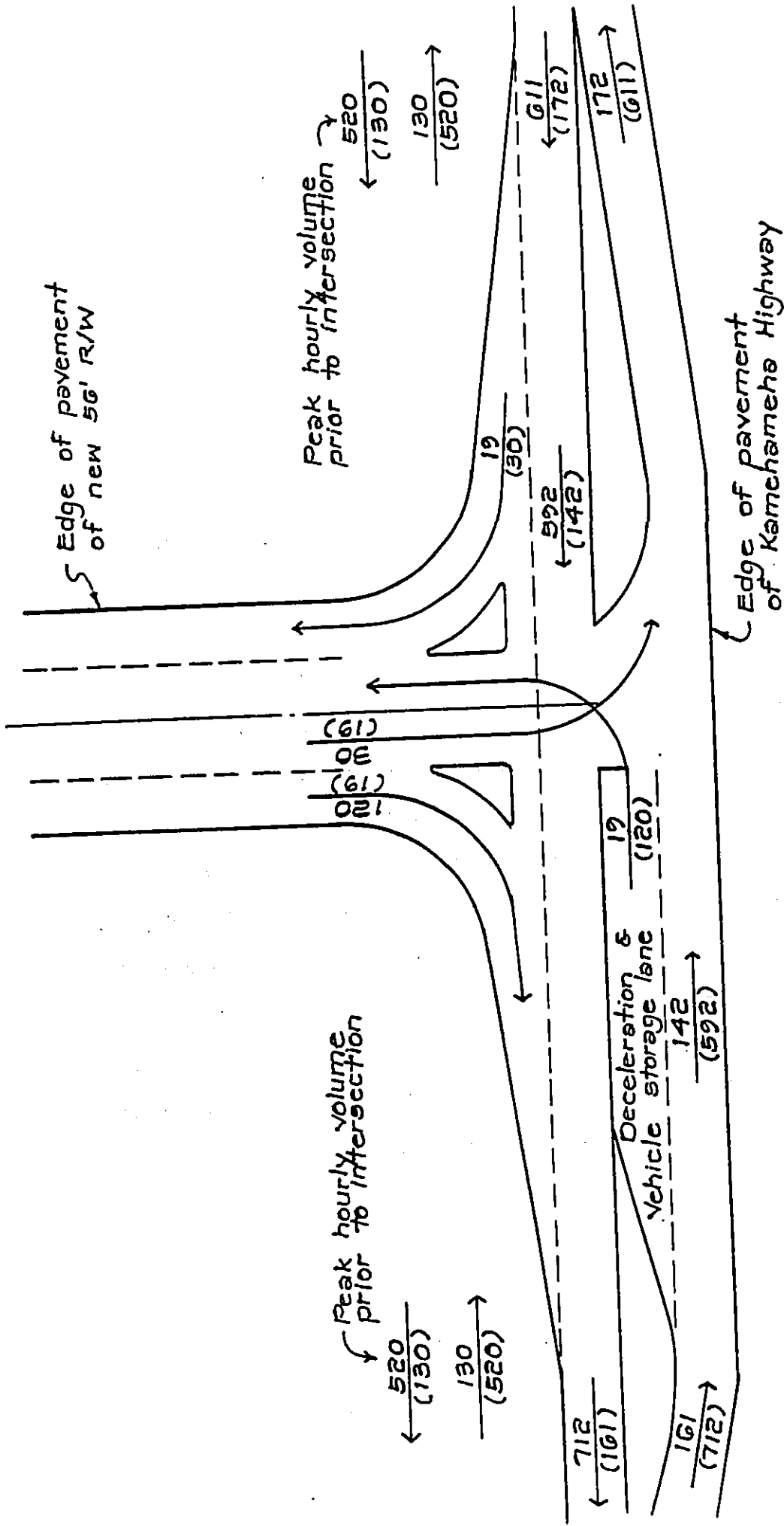
There is presently no aesthetic value to the site. It is a largely unused site choked with introduced weed species and littered with car bodies and other waste. There is only a limited view of the Bay from Kamehameha Highway, due to the stands of hau and hala along the shoreline.

The subdivision will make a view of the Bay possible for the residents of the upper portions of the subdivision. There will be no adverse impact on aesthetics and viewplanes.

D. Traffic

Kamehameha Highway, fronting the project site is a two-lane, two-way highway with uninterrupted flow characteristics, i.e. the influence of intersections or roadside development is not significant. Based on traffic counts taken on Kamehameha Highway at the Heeia viaduct, the average daily traffic (ADT) and peak hourly volumes (PHV) have not exceeded 5,600 vehicles and 680 vehicles, respectively, over the period from 1972 through 1980.

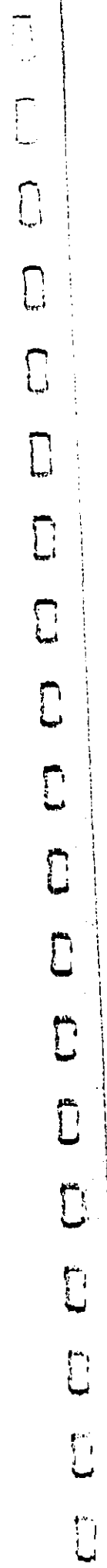
Ultimate development of the Heeia Kea Subdivision will increase the existing average daily traffic (ADT) and peak hourly volume (PHV) by approximately 3,000 vehicles and 300 vehicles, respectively. The increase in traffic will require the developer to install channelized intersections at the two 56-foot wide right-of-way intersections with Kamehameha Highway. Figures 15 and 16 show both intersections and the traffic movements which are anticipated at each intersection.

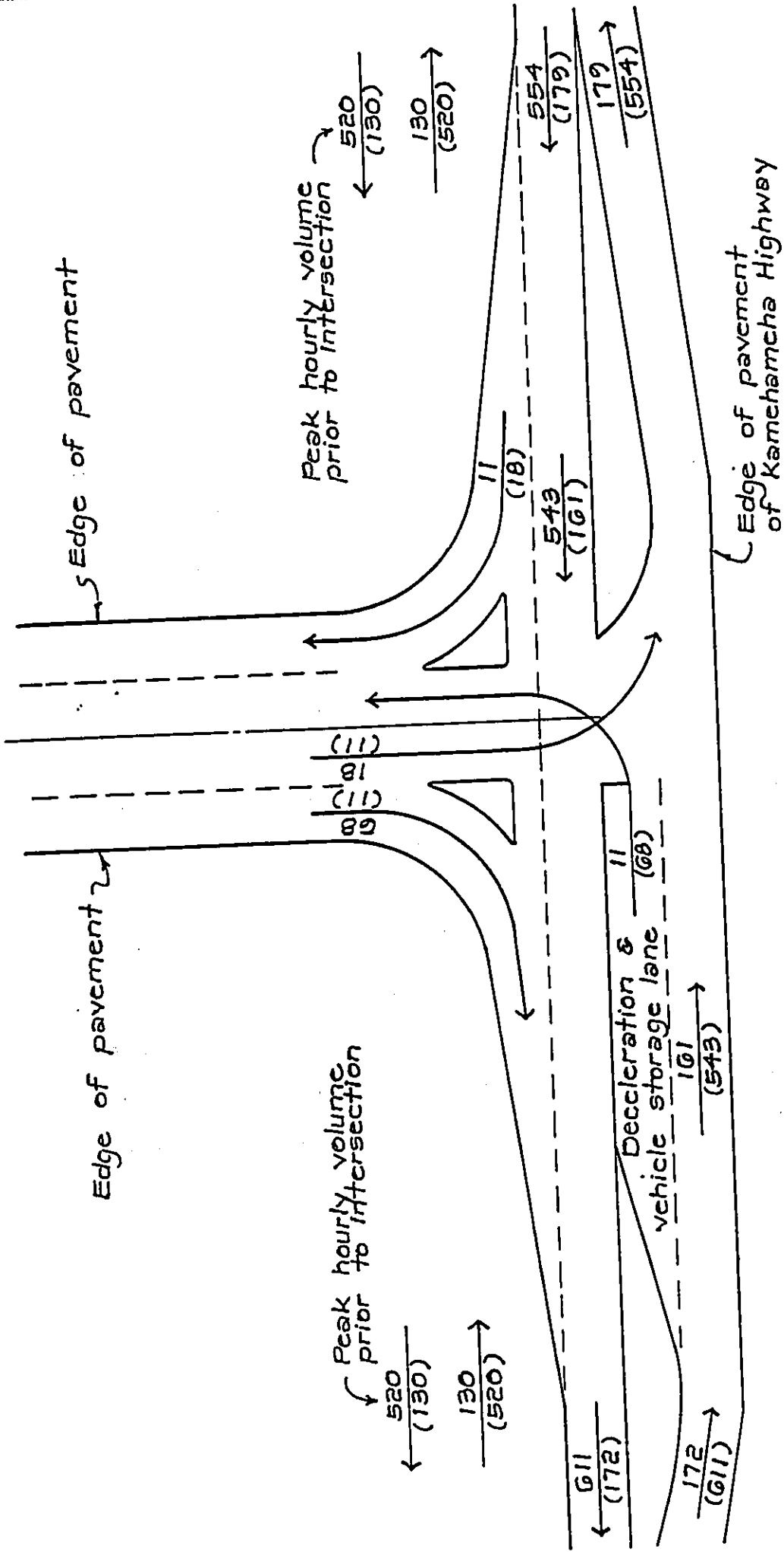


268 Total Lots (New)
 0.7 Trip generation factor
 ASSUME: 80/20 Distribution factor
 80/20 Turning distribution factor
 (In direction of peak hourly flow)
 50/50 Turning distribution factor
 (Direction opposite of peak hourly flow)

Peak hourly vehicles - AM
 (Peak hourly vehicles - PM)

FIGURE 15
ANTICIPATED
PEAK HOURLY TRAFFIC
AT INTERSECTION 'A'





157 Total Lots (New) INTERSECTION "B"

0.7 Trip generation factor
 80/20 Distribution factor
 80/20 Turning distribution factor (In direction of peak hourly flow)
 50/50 Turning distribution factor
 50/50 (Direction opposite peak hourly flow)

Peak hourly vehicles - AM
 (Peak hourly vehicles - PM)

FIGURE 16
ANTICIPATED
PEAK HOURLY TRAFFIC
AT INTERSECTION "B"

Kamehameha Highway, prior to the completion of Kahekili Highway in 1972, was the major throughfare for north and south-bound traffic within Windward Oahu. However, since the completion of Kahekili Highway, Kamehameha Highway has been limited primarily to localized traffic. Correspondingly, the yearly increase in average daily traffic has significantly reduced to a level of no predictable growth since the completion of Kahekili Highway. During the period 1968 through 1972, the average daily traffic on Kamehameha Highway increased from 5,600 vehicles per day to 7,900 vehicles per day or approximately 575 vehicles per year. This represents an annual growth rate of approximately 9 percent. This growth rate is comparable to the population growth rate of the windward area. However, since 1972 the average daily traffic growth rate has not followed any definite trend. Over the years 1972 through 1980, the average daily traffic has been varied between 4997 vehicles and 5594 vehicles.

Other than the proposed Heeia Kea Subdivision, there are no other areas of significant size along Kamehameha Highway between Kaneohe town and the Kahekili intersection which can or will likely support development which will add substantially to the anticipated average daily traffic or peak hourly vehicle counts. Therefore, no improvements other than channelization at the two subdivision intersections are proposed. However, the use of the proposed intersections does not eliminate potential highway widening at some time in the future should it be necessary.

The capacity of a two-lane rural highway is 600 to 1,000 vehicles per hour (vph) per lane depending on the local conditions. For purely comparative purposes, the Highway Capacity Manual indicates that the capacity (Level of Service E) is 1400 vph for this roadway in the vicinity of the project. The existing peak hour traffic is approximately 520 vph per lane which occurs in the Kaneohe bound lane of Kamehameha Highway during the morning rush hour. It is anticipated that the project will increase this by approximately 200 vehicles to 712 vph per lane based on the traffic projections contained in Figures 15 and 16.

This will decrease the level of service, but the level of service will still be tolerable and well within the capacity of Kamehameha Highway. The channelized intersections at the project's major intersections will enhance traffic motions and help mitigate the effects of additional traffic.

All traffic generated from the Heeia Kea Subdivision will potentially add to existing traffic congestion at other intersections and particularly at the intersection of Kahekili Highway and Likelike Highway. The peak hourly traffic on the Kahekili leg of this intersection was 2,040 vehicles in 1979. If it were assumed that 50 percent of the Heeia Kea Subdivision peak hourly traffic passed through this intersection, the peak hourly volume would increase approximately 5.5 percent. While any increase in traffic at this intersection is considered adverse, it is anticipated that all increments of the Heeia Kea Subdivision will not be completed for 6 to 9 years. Gradual increases in

traffic from the proposed subdivision and other development will be assimilated into the existing traffic volumes and as a worst condition, the peak hour traffic period will extend to accommodate larger volumes. As the optimum condition, the State's H-3 or TH-3 Trans-Koolau System will be available.

E. Public Utilities and Services

1. Water

As presented within the description of the project's technical characteristics, water will be made available to the Heeia Kea Subdivision by connection to the Board of Water Supply's existing transmission system within Kamehameha Highway. A 30-inch transmission main as well as an 8-inch distribution main exist within the right-of-way and are a part of the Board of Water Supply's 272 Punaluu System.

The Heeia Kea Subdivision will have an impact on the capability of the Board of Water Supply's system, however, the impact is not considered significant. It is generally recognized that Windward Oahu has numerous areas for source development to meet Oahu's water demand. The project's 0.2 mgd (average) and 0.6 mgd (peak) water consumption rates are a part of the Island's growth which has been master planned and there is a reasonable likelihood that there will be no need to immediately expand any of the existing water system to serve the Heeia Kea Subdivision, with the exception that

additional storage (reservoir) in the Board's system will be necessary. Nonetheless, the project will ultimately pay approximately \$450 per lot to the Board of Water Supply for the purpose of providing additional source development capacity and additional transmission system. In addition, the project will provide 0.3 mgd storage capacity.

2. Sewage Treatment and Disposal

The project site under its existing conditions is served by cesspools. There is no existing centralized sewage collection system for the area.

The Heeia Kea Subdivision will have a beneficial impact on the existing conditions since the project proposes to connect to the City and County of Honolulu master-planned sewer system for the area. The beneficial nature of this impact is based on the fact that the use of cesspools will become obsolete for the project site as well as the surrounding areas. It is generally observed that connection to a municipal sewer system is superior to the use of individual systems. There are two potential methods for connection as presented within the project's technical characteristics, and it will be the City's decision as to which method should be utilized.

The proposed sewer connection will also have an impact on the existing City and County of Honolulu sewage treatment facilities based on the fact that the project will create an additional load. The average and peak flows anticipated for the subdivision are 0.17 mgd and 0.97 mgd, respectively. The additional load should not be significant since no connection will be allowed until all components of the sewer system (gravity sewer, force mains and sewage treatment works) have been reviewed and determined to be adequate or upgraded.

3. Telephone and Electrical Services

Telephone and electrical service which will ultimately serve the Heeia Kea Subdivision exist within the Kamehameha Highway right-of-way fronting the project. The existing system is adequate for the area and the utilities have the capacity to serve the project. No significant impact is anticipated with respect to telephone and electric service.

4. Solid Waste Collection

The City and County of Honolulu refuse collection vehicles presently pick-up refuse in the area. This practice will continue for the Heeia Kea Subdivision. There is no direct impact anticipated based on the method of collection. However, there is an indirect impact relating to refuse collection. This impact is caused by an increased demand on the island's refuse

collection vehicles, landfills and incinerator, as well as an increased demand for refuse collection worker employment. The average cost of municipal collection is approximately \$165 per household per year excluding landfill operation.

5. Police and Fire Protection

The Heeia area presently has adequate police and fire protection. The proposed subdivision will increase the work load for police patrols and potentially increase the demand on the Fire Department. The subdivision will be constructed with the hydrants maintaining adequate fire flow, pressure and spacing to augment the Fire Department fire fighting capabilities. The increased demand on the Police Department and potentially increased demand on the Fire Department are not considered to be significantly adverse. Property taxes from the 389 proposed units will be partially utilized to increase necessary services.

6. Schools

The Department of Education has estimated that the project will ultimately generate an enrollment of 40-100 children to Heeia Elementary School, 10-25 children to King Intermediate school and 15-40 students to Castle High. The Department also indicates those schools are capable of accommodating this enrollment.

7. Recreation

There are no existing recreational facilities on the project site. However, within the Heeia area, sites available for recreational activities include the Heeia Kea Small Boat Harbor and Heeia State Park. The Heeia Kea Subdivision will potentially increase usage of these recreational sites as well as sites at farther distances. However, the subdivision itself will also provide a 3.5 acre park site. No adverse impact is anticipated on recreational activities of the area as long as the 3.5 acre park within the subdivision is appropriately planned. The park plans will be coordinated with the City and County Department of Parks and Recreation.

8. Mass Transit

City and County of Honolulu bus service exists on Kamehameha Highway fronting the project. This bus service will also serve the proposed subdivision from the highway. Based on average values of 4.1 persons per household and a 25% bus use factor, the project could generate between 360 and 440 mass transit users on a daily basis. This potential increased usage is notable based on the fact that there is a generally observed bus shortage and chronic demand for additional routes and shorter headway times. The present headway time on Kamehameha Highway is approximately 20-30 minutes.

The Heeia Kea Subdivision will provide bus stops appropriately located based on consultation with the City and County Department of Transportation Services. The project's impact on the bus system is not anticipated to be significant. Additional buses for routes serving the Heeia area will be provided as necessary and available based on an evaluation of the whole bus system's demand. If the bus system's capabilities do not suit potential user needs, then alternative modes of transportation (normally automobiles) will be found.

F. Socio-Economics

The project site is near the fringe of urban development within the Kaneohe area of Windward Oahu. To the south, existing subdivisions, such as Alii Bluffs, Alii Shores and Alii Cluster Park mark nearby residential development not unlike that which is proposed. To the west lies the Ahuimanu area and its predominant residential development. To the north, along Kamehameha Highway, numerous existing single-family residences take advantage of the views of Kaneohe Bay.

The 1981 State of Hawaii Date Book documents the population of census tract No. 103.04 at 9,784 people. This census tract is generally bounded by Heeia Stream, Kahaluu Stream, Kaneohe Bay and the Koolau Ridge line and essentially represents the population of the Ahuimanu area. The adjacent census tract to the north (103.03) is bounded by Kahaluu Stream and the Koolauloa-Koolaupoko District

boundary. This tract which generally describes the Kahaluu area has a population of 3,593 residents. A typical ethnic breakdown for the region indicates 33 percent Caucasian stock, 25 percent Hawaiian stock, 19 percent Japanese stock and 23 percent attributable to all other ethnic backgrounds, including Chinese, Filipino, Korean, Blacks, American Indians, Germanians, Samoans and others. The average age in the region is approximately 24.0 years. The average family contains four (4) persons and the median income is approximately \$16,500.

The proposed Heeia Kea Subdivision will not significantly change the socio-economic character of the area. Ultimate development could place an additional 1,500 to 1,700 residents in the Ahuimanu census tract, however, this area has been one of the fastest growing residential areas on Oahu over the past 10 years. The ethnic backgrounds, median family-income, family-size and average age will also remain reasonably similar to that which presently exists. The project site does not support any of the small agricultural operations of the area, and there will be no direct impact on agriculture.

The most significant socio-economic impact of the proposed project relates to the manner in which growth is perceived in the region. On the one hand, there is a need for residential housing to support families who wish to upgrade their housing standards or become homeowners. In addition, this growth represents a boost to the general economy through construction as well as retail and commercial sales on a long term basis. On the other hand, some residents of the area perceive growth as an encroachment on the

perpetuation of suburban or rural lifestyle within Windward Oahu. These small farmers and residents see urban growth as a negative effect decreasing the potential for diversified agriculture.

There will also be a socio-economic impact on the existing residents who will be displaced. However, representatives of the owners are working with those residents to resolve this matter. One proposed conceptual solution is to offer the existing residents lots at subsidized prices, however, a final solution has not been reached. It is the desire of the owners to find a solution that will satisfy the majority of Heeia Kea Homeowner's Association.

V. ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The Heeia Kea Subdivision is anticipated to have the following unavoidable adverse environmental effects.

1. Construction activities will cause minor and temporary increases in noise levels and air quality deterioration. Surface water quality deterioration related to construction will be proportional to the effectiveness of temporary erosion control measures.
2. There will be a minor but adverse long term impact on the surface water quality of Kaneohe Bay resulting from an increased quantity of stormwater runoff.
3. The Heeia Kea Subdivision will produce a permanent demand on the Island's utilities, i.e. water, sewer, electric and telephone systems.
4. The project will increase the amount of traffic on Kamehameha Highway and other Windward roadways. The result of increased traffic will be increased congestion and vehicle emissions. The

level of service of traffic on Kamehameha Highway will be reduced as compared to ideal conditions but is anticipated that the level of service will be tolerable.

5. The noise level in the area resulting from Kaneohe Marine Corps Air Station will approach the maximum permissible for residential areas.
6. There will be an increased demand on public facilities, i.e. schools, police protection, fire protection, libraries and recreational facilities.

In light of the foregoing adverse environmental effects, the rationale for proceeding with the proposed project is as follows:

1. None of the foregoing adverse effects either singularly or cumulatively is expected to create any significant impact to the area. The proposed subdivision is not out of character with the environment and in fact is very similar in nature to almost all of the residentially developed areas north of Kaneohe town along Kamehameha Highway. The availability of infrastructure and potential views for homeowners make the site ideal for a residential area.
2. There is a strong demand for residential housing on Oahu in the median-income group. The proposed subdivision will provide for this market by creating lots of a size which are affordable to a median-income family. The subdivision is not geared toward mainland investment nor is it geared toward estate-type living. Some low and moderate cost units will be included in the project.

3. The economic viability of other types of development and in particular, diversified agriculture, are not realistic. Of the crops previously grown on the site, only pineapple achieved any success. This economic success terminated concurrently with the advent of field mechanization requiring flatter and larger areas for crop production.
4. There is a concern among some within Windward Oahu that each new project that receives approval represents the project that opens the gate to transform the rural character of parts of Windward Oahu into a suburban area. However, neither the location or character of the project site represent such a threat to the community.

VI. ALTERNATIVES TO THE PROPOSED ACTION

A. No Action

No action would leave the project in its existing condition. The benefit of this action will be that none of the adverse effects will be realized. The adverse effects of no action will be that a housing demand will persist and additional pressures will be generated to develop residential housing. No action will not attain the objectives of the proposed project and this alternative has been rejected.

B. Agricultural Development

Agricultural development of the site would be in conformance with the previously proposed Development Plan for Koolaupoko, which was vetoed by the Mayor in 1981. Potential agricultural development in the form of papaya or banana appear to have greater

viability than any other crop. However, the lack of water and slope of the site are limiting factors for any agricultural endeavor. The last commercially produced agricultural product from the site was pineapple. However, pineapple production ceased in the early 1900's.

Many of the existing small diversified agricultural operations and truck farms within the Kahaluu and Upper Windward area of Oahu result in a secondary source of income. Income is possible mainly as a result of low lease rent, free water from streams and Auwai systems, low labor costs and low capital costs. Labor costs are low mainly as a result of family participation in the small agricultural operations. The factors which allow any economic return on the existing agricultural operations do not apply to the project area. The lack of water and terrain will require expenditures for water as well as capital improvements.

From an environmental perspective, agricultural development will have an adverse effect on Kaneohe Bay water quality which will be comparable to that of the proposed residential subdivision. In fact, the long-term impact may be greater under agricultural use since more soil loss and nutrient loss are generally attributed to agricultural activities. The agricultural alternative does not provide any reasonable expectation of providing economic usefulness of the site. Therefore, one of the objectives of the proposed project cannot be met through this alternative. For this reason, agricultural development of the site has been rejected as an alternative.

C. Reduced Density Development

The alternative of reducing the scale of development to approximately one-half of that proposed has been suggested through consultation comments by the Kahaluu Neighborhood Board No. 29. The scale suggested would allow approximately 190 units in a cluster arrangement. (See Kahaluu Neighborhood Board Consultation letter dated December 20, 1982.) The primary motivation behind this type of alternative is the reduction of impact on the land, public facilities and social fabric of the community.

Reducing the scale of development will reduce the potential or actual short-term impact to the water quality of Kaneohe Bay during construction and will reduce the impact on traffic using Kamehameha Highway. Other than these two specific areas, the environmental impact of reduced scale development and the proposed 389-lot development are approximately the same. To illustrate this point, the same type of on and off-site sewer system will be needed regardless of the project size. The same is also true for the water system. Further, the Department of Education reports enrollment can be accommodated, the Fire Department indicates fire protection can be provided and the same type of information has been provided by most public facility agencies for the 389-lot development.

Therefore, the alternative of a reduced scale development exists and has been provided within this document. However, it has been rejected at present since this alternative, for all practical purposes, has similar impacts as full scale development except for

the potential short term impact with respect to water quality if effective erosion control is not utilized and the long term impact with respect to traffic. Peak hourly traffic counts are approximately 650 vehicles per hour at present and will approach 900 vehicles per hour when the project is ultimately completed. It is reasonably fair to assume that half-size development may produce 775 vehicles per hour during the peak hour. Both peak hour projections are above what is considered an ideal level, however, both projections are less than recognized maximums for a two-lane two-way highway such as Kamehameha Highway.

D. Alternative Type Housing

Alternative types of housing which have been considered for the project site are planned development housing and cluster housing. Planned development housing has been rejected as an alternative since the area is predominantly, if not totally, characterized by single-family residential dwellings. On the other hand, a cluster housing development could maintain the single-family residential character of the area. Cluster housing also allows flexibility with respect to Subdivision Rules and Regulations as pertaining to roadway sizes, grades and alignments. Cluster housing also allows more dense spacing of housing for the purpose of creating open areas, normally referred to as "common areas", which are utilized for recreational purposes and buffer areas between groups of homesites.

It would be physically possible to construct a cluster housing project on the site with 389 single-family residences. In

principle, this type of development would be very similar to the project as proposed. The impact of a 389-unit cluster housing project would also be principally the same as the proposed 389-lot subdivision. In lieu of the similarity between the cluster housing alternative and proposed subdivision, cluster housing may be considered for portions of the project if this alternative is more practical based on additional analysis.

VII. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Development of the site will establish a long-term productivity as a source of median-income housing for Oahu residents. No short-term uses are proposed and no long-term losses are anticipated. The site has little potential for agriculture. No unique or rare biota exist on the project site and no significant historical or archaeological artifacts have been documented. The site is not a source for potable water and negligible long-term loss of water quality in Kaneohe Bay is expected. No scenic views will be lost and the project will not interfere with present activities in surrounding areas.

VIII. MITIGATION MEASURES TO MINIMIZE IMPACT

The following measures are proposed to mitigate the adverse effects outlined in Section V:

1. The adverse effects of construction noise will be mitigated by performing work utilizing heavy equipment during daytime hours and during weekdays. No grading activities or activities which produce high noise levels will be allowed during holidays, weekends or

before 7:00 a.m. and after 4:00 p.m. In addition, the Contractor is responsible for obtaining a noise permit. Conditions of the noise permit are identification of activities which will exceed 55 decibels, as well as a description of the methods, i.e. mufflers and enclosures, which will be utilized to reduce higher noise levels.

The adverse effects of air quality deterioration during construction will be mitigated by wetting down loose soils when earthwork activities occur or when earth surfaces are exposed. Vehicle emissions from internal combustion engines of construction vehicles will be minimized by ensuring that engines are in proper operating condition.

Surface water quality deterioration during construction will be mitigated by using an erosion control plan during grading. The plan will be reviewed and approved by the City and County of Honolulu. Erosion control will be in the form of performing work during drier periods of the year and utilizing effective filter berms and sediment traps and sediment ponds. The maximum sized grading increment which can be opened at any one time is 20 acres. Every grading increment must be completed and grassed prior to opening of additional increments.

2. The long-term adverse effects of surface water quality deterioration to Kaneohe Bay resulting from increased surface runoff are not anticipated to be significant. Permanent landscaping will be used to mitigate increased surface runoff. Landscaped areas will have a greater tendency to retain rainfall and runoff.

12 11 10 9 8 7 6 5 4 3 2 1

3. The adverse effects of permanent demands placed on the Island's utilities and facilities cannot be mitigated directly. However, the planning process, construction plan approval process and ultimate subdivision approval process will provide sufficient review to ensure that the project's demands will not significantly effect utilities and facilities. Any utilities and facilities which are inadequate will be upgraded in accordance with the requirements of the appropriate agency.
4. The adverse effect of increased traffic will be mitigated by providing channelized intersections within Kamehameha Highway to facilitate turning motions and through traffic. The adverse effect of increased traffic within the Kaneohe area during peak traffic hours will be alleviated once projects, such as the State's H-3 or TH-3 projects are completed. The level of traffic on Kamehameha Highway will be reduced as compared to ideal conditions, however, it will be tolerable.
5. The effect of an increased noise level in the Heeia Kea area resulting from the project is not considered significant. No mitigation measures are proposed other than landscaping around the park area to provide a buffer for neighboring residents. The potential adverse effect of aircraft noise on some prospective buyers can be addressed by proper disclosure during sales and mitigated by the use of appropriate acoustical materials in house construction when desired.
6. It is expected that the additional archaeological work will be completed prior to construction to provide reasonable satisfaction

that all significant archaeological value of the site has been appropriately evaluated. Additional work will be performed after consultation with the Historic Sites Section of Department of Land & Natural Resources. Additional work may utilize the following steps including test trenching, stratigraphic investigations, radiocarbon dating, preservation and additional literature review. All work will be performed in a logical order based upon the results of further work, i.e. radiocarbon dating is not proposed if test trenches do not reveal suitable justification.

IX. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Implementation of the Heeia Kea Subdivision will represent an irreversible and irretrievable commitment on the land. Project implementation will also represent an irreversible and irretrievable commitment on all utilities and facilities which would normally serve the area. These utilities and facilities are roadways, water, sewer, solid waste, schools, fire protection, police protection and recreational facilities. However, a major portion of the utility and facility commitments are the utilization of manpower and materials.

With respect to resources, only the commitment on the land and degradation to Kaneohe Bay will be nonrenewable for all practical purposes. The water commitment for the project involves a renewable resource which is generally observed to be in excess supply and therefore, ample to serve this project as well as future growth.

X. AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS OF GOVERNMENT POLICIES ARE THOUGHT TO OFFSET THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

It is inherent that any development will have adverse environmental effects. However, government policy normally directs growth and development in areas suitable for growth with an underlying concern for the environment. Areas with obvious or notable environmental ramifications are normally protected by a preservation planning designation and by preservation zoning.

The adverse environmental impacts of the proposed project are the minimum typical for residential development, and even if the proposed project could be constructed on alternative sites within the Kaneohe Bay Watershed, the impacts would remain essentially unchanged or increase in scope. Therefore, the countervailing benefit of providing housing for a market where there is a real demand will always be at some expense to the environment.

The project's most notable effect is one which is subjective in nature and centers around the ability of the project to transform the Kahaluu and Upper Windward regions of Oahu from rural character to suburban. However, the project location is in the Kaneohe-Ahuimanu area which is recognized as urban fringe and not within the Upper Windward population area which is recognized as rural.

XI. ORGANIZATION AND PERSONS CONSULTED

An Environmental Impact Statement Preparation Notice was published in the EQC Bulletin on November 23, 1982 for the Heeia Kea Subdivision, Koolaupoko District, Oahu. Concurrently with publication of the

foregoing bulletin, 40 copies of the preparation notice and requests for consultation comments were sent to the agencies and groups identified in the table on the following page. Of the 40 requests for comments, 29 groups or agencies responded with comments and all responses were answered. Appendix A contains a copy of the EIS Preparation Notice. All consultation comments and responses are included within this section following the table of agencies and groups contacted for comments.

In addition to the foregoing comments, various consultants and experts were utilized to help prepare portions of the Draft EIS. Persons and firms responsible for the preparation of this EIS include: Gray, Hong & Associates, Inc., Civil and Sanitary Engineers; Cowell & Co., Inc., Real Estate Consultants; Barry D. Root, Air Quality Consultant; Dr. Frank S. Scott, Jr., Ph.D., Agricultural Economist; Dr. Charles Lamoureux, Botanist; Dr. Andrew J. Berger, Zoologist; Joseph Kennedy, Archaeological Consultants of Hawaii.

AGENCIES AND ORGANIZATIONS INVOLVED IN THE CONSULTATION PERIOD

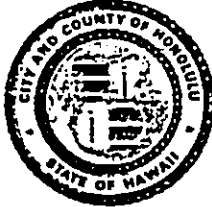
<u>Agency</u>	<u>Date Notice Mailed</u>	<u>Date of Comment</u>	<u>Date of Response</u>
<u>City and County of Honolulu</u>			
Building Department	11/23/82	12/16/82	01/24/83
Honolulu Fire Department	11/23/82	12/22/82	01/24/83
Department of General Planning	11/23/82	12/20/82	01/24/83
Department of Parks and Recreation	11/23/82	12/14/82	01/24/83
Board of Water Supply	11/23/82	12/15/82	01/24/83
Police Department	11/23/82	12/09/82	01/24/83
Department of Public Works	11/23/82	12/20/82	01/24/83
Department of Transportation Services	11/23/82	12/27/82	01/24/83
Department of Land Utilization	11/23/82	12/10/82	01/24/83
Department of Housing and Community Development	11/23/82	12/22/82	01/24/83
Department of Health	11/23/82	12/22/82	01/24/83
<u>State</u>			
Department of Education	11/23/82	12/27/82	01/24/83
Department of Transportation	11/23/82	12/13/82	01/24/83
Department of Planning and Economic Development	11/23/82	12/22/82	01/24/83
Department of Land and Natural Resources	11/23/82	None	
Department of Health	11/23/82	01/17/83	01/24/83
Office of Environmental Quality Control	11/23/82	12/27/82	01/24/83
Department of Agriculture	11/23/82	12/09/82	01/24/83
Department of Hawaiian Home Lands	11/23/82	12/06/82	01/24/83
Department of Social Services and Housing, Hawaii Housing Authority	11/23/82	None	
State of Hawaii, State Main Library	11/23/82	None	
State of Hawaii, Kaneohe Regional Library	11/23/82	None	
Environmental Center, University of Hawaii	11/23/82		
Water Resources Research Center, University of Hawaii	11/23/82	12/14/82	01/24/83
<u>Federal</u>			
Department of the Army, Corps of Engineers	11/23/82	12/09/82	01/24/83
U.S. Department of the Interior, Fish and Wildlife Service	11/23/82	12/15/82	01/24/83
U.S. Department of Agriculture, Soil Conservation Service	11/23/82	12/17/82	01/24/83
U.S. Department of Defense, U.S. Marine Corps	11/23/82	12/16/82	01/24/83

Other

Citizens Agains Noise	11/23/82	12/20/82	01/24/83
Life of the Land	11/23/82	12/17/82	01/24/83
Kaneohe Outdoor Circle	11/23/82	None	
American Lung Association of Hawaii	11/23/82	None	
Kahaluu Neighborhood Board No. 29	11/23/82	12/21/82	01/24/83
Kaneohe Neighborhood Board No. 30	11/23/82	None	
Kaneohe Community Council	11/23/82	None	
Kaneohe Business Group	11/23/82	None	
Kaneohe Bay Community Association	11/23/82	None	
Hui Malama Aina O' Koolau	11/23/82	12/22/82	01/24/83
Key Project	11/23/82	None	
Sierra Club	11/23/82	01/06/83	01/24/83
Heeia Kea Community Association	11/23/82	12/23/82	01/24/83

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

DEC 10 1982
Date Received
File: 1032
To: DB
Action:



EILEEN R. ANDERSON
MAYOR

MICHAEL M. MCELROY
DIRECTOR

ROBERT B. JONES
DEPUTY DIRECTOR

LU11/82-6209(SM)

December 9, 1982

Mr. Brian L. Gray
Gray, Hong and Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Comments to Environmental Impact Statement (EIS)
Preparation Notice--Heeia Kea Subdivision
Heeia, Koolauoko, Oahu

We have reviewed the above, and feel that the following topics should be more thoroughly discussed in the Draft EIS.

1. Grading - a preliminary grading plan showing existing topography, and approximate finished grade elevation should be shown; preliminary consultation with the Department of Public Works (DPW) is recommended.
2. Drainage - a preliminary drainage plan showing proposed structures (drainlines, swales, outlet structures) and anticipated storm runoff quantities from the project site should be presented; preliminary consultation with DPW and the Department of Health is recommended.
3. Sewage - a clarification of how the sewage system for the proposed project relates to the Heeia-North Sub Area and the Kahaluu-East Sub Area Facilities, from a plan view, and phasing of proposed sewage infrastructure with locations and sizes.
4. Traffic - a more detailed traffic evaluation including turning movements, and capacities of intersections and roads.
5. Air Pollution - a generation of pollutants quantified, and a dispersion analysis under worst case conditions.

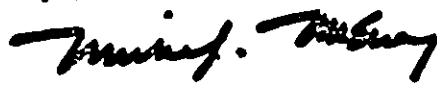
Mr. Brian L. Gray
Page 2

6. Archaeology - a reconnaissance survey of the project site by a qualified archaeologist will be required for the Special Management Area Use Permit (SMP); it would be advantageous to complete this survey as soon as possible, and include it in the EIS.
7. Economics - a clarification of the intent to develop the lots, or sell them undeveloped, in fee or leasehold.
8. Flora and Fauna - an expansion of the discussion of impacts on flora and fauna.

Since this project will require both a Special Management Area Use Permit and a Shoreline Setback Variance, the EIS should be prepared under the provisions of Chapter 343, HRS.

If there are any further questions, please contact Sampson Mar of our staff at 523-4077.

Very truly yours,



MICHAEL M. McELROY
Director of Land Utilization

MMM:s1

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Michael M. McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. McElroy:

We thank you for your comments dated December 9, 1982. As a general response, all topics referenced in your letter will be discussed more thoroughly in the text of the Environmental Impact Statement (EIS). The following are responses to your specific comments.

1. Grading

The EIS will contain a preliminary grading plan showing existing and finished grades. In addition, the Department of Public Works (DPW) has been forwarded a copy of the EIS Preparation Notice for the purpose of requesting consultation comments.

2. Drainage

A preliminary drainage plan will be prepared showing runoff quantities and existing structures. Both DPW and the Department of Health have been asked for consultation comments.

3. Sewage

The alternative sewage connections referenced in the DPW Facility Plans will be a part of the EIS. These plans indicate size, direction of flows and location characteristics of the proposed sewer system alternatives.

4. Traffic

A section of the EIS will be devoted solely to traffic. The traffic section will discuss growth characteristics, capacities and include diagramatic plans illustrating traffic movements.

XI - B1

Mr. Michael M. McElroy
January 24, 1983
Page Two

5. Air Pollution

An air pollution study under worse case conditions will be a part of the EIS. In general, present air quality modeling (EPA's Mobile 2) indicate very low emissions as compared to both Federal and State criteria. Previously, EPA's Mobile 1 was the standard to predict air quality emissions, but this number was grossly conservative and not verifiable under actual conditions. Mobile 2 has shown good correlation between modeling and field conditions in Hawaii.

6. Archaeology

An archaeological reconnaissance will be a part of the EIS.

7. Economics

The EIS will address all phases of the project, but the culmination of the project will be development of the lots with single-family residences. The market will dictate to a certain degree whether the developer will construct homes on the lots and whether lots will be in lease or fee. It is inherent that the project must be affordable to be viable and it is anticipated that the developer will make every effort to make the project as economically viable as possible. Therefore, we would like to present the EIS with all marketing options being left open for the sake of viability.

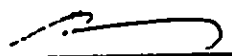
8. Flora and Fauna

The EIS will contain both flora and fauna reports prepared by expert consultants.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

DEC 27 1982

Date Received _____

File: _____

December 23, 1982: DB

Action: _____

Brian L. Gray
Gray, Hong and Associates, Inc.
116 So. King Street
Room 508
Honolulu, Hawaii 96813

Re: Draft EIS for Heeia Kea Subdivision

Dear Mr. Gray:

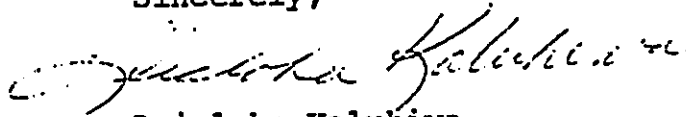
The Heeia Kea Community requests that your draft environmental impact statement thoroughly analyze and report on the following possible effects of the proposed Heeia Kea Subdivision:

1. The effects on the residents with regard to relocation and availability and affordability of substitute housing;
2. The effects on the shoreline and the water quality of Kaneohe Bay;
3. The impacts on traffic congestion and highway safety;
4. The burdens on public services such as schools, fire protection, police protection and health facilities due to increased population in the area;
5. The impact on property values in Kahaluu and the ability of property owners in surrounding areas to pay increased property taxes;
6. The impacts of sewage disposal and drainage facilities on Kaneohe Bay;
7. The cumulative impact of increased population on coastal resources and heavier use of the shoreline area;
8. The cumulative impact of this and other proposed projects on the rural, agricultural lifestyle of the Kahaluu community;
9. The impact on the land use planning process and consistency with the Oahu General Plan and the proposed Development Plan for the area;
10. An evaluation of the cost of the proposed homes and whether there will be any low or moderate income housing in the project;

11. The proposed date of completion of the project;
12. A complete archaeological and historical study of the area; and
13. The amount of water necessary for the project.

Thank you for the opportunity to make suggestions.

Sincerely,



Leialoha Kaluhiwa
for the
Heeia-Kea Community Association

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Heeia-Kea Community Association
c/o Mr. James Sanders
46-532 Kamehameha Highway
Kaneohe, Hawaii 96744

Attention: Ms. Leialoha Kaluhiwa

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Gentlemen:

We thank you for your comments dated December 23, 1982. Your comments will be made a part of the Environmental Impact Statement (EIS). We are forwarding the following information regarding the EIS and your specific concerns.

1. As you are probably aware, the owners are in the process of developing a plan for relocating the existing occupants. One of the potential methods is making lots available within the project at subsidized prices. However, no definite method has yet been determined.
2. The EIS will contain one section devoted to water quality effects on Kaneohe Bay.
3. The EIS will have a section devoted to traffic and traffic analysis.
4. All public facilities and services, including schools, fire protection, police protection and health facilities have been contacted for input into the EIS.
5. The project should not have any significant effect on property values or taxes. Property values are set by the assessor's appraisal based on the market value. The market value in the area will not necessarily change. If, in fact, there was an over supply of housing, the market value could actually decrease and conversely, if the demand exceeds the supply, the market value can increase.
6. The EIS will address sewage disposal and drainage. There are two (2) possible methods to connect to the City and County master-planned sewer system. With respect to drainage, the EIS will contain preliminary hydrologic information which will be the basis for the project's drainage report.
7. No substantial impact is anticipated on coastal resources. The project itself does not front the shoreline.

XI-B2

116 SOUTH KING STREET, RM. 508, • HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306

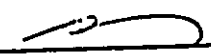
Heeia-Kea Community Association
January 24, 1983
Page Two

8. The project is in the urban fringe area and is isolated from the Kahaluu Area which is typically cited as rural. The ridge behind the project forms a physical barrier. The actual project is in between suburban type residential development in either direction on Kamehameha Highway. Due to the physical separation and nearness of similar development, there does not appear to be any material infringement on rural lifestyles. As for agriculture, the site does not have realistic agricultural viability. The State of Hawaii Department of Agriculture has indicated the project should have little impact on agriculture and the EIS will have a separate agricultural feasibility study.
9. The EIS will address the existing Detailed Land Use Map (DLUM) and proposed Development Plans. The EIS will also discuss the Hawaii State Plan, Coastal Zone Management Plan, Oahu General Plan and the Special Management Area.
10. A market study will be a part of the EIS. The purpose of the study is to estimate the demand for single-family housing. No final determination has been made on marketing, however, it is the intent to provide a finished product at a price which is affordable to prospective buyers.
11. The EIS will contain a preliminary time schedule for development. In general, approximately 3 to 5 phases are contemplated over 6 to 9 years. However, the market and economy play strong roles in this schedule and flexibility must be assumed.
12. An archaeological reconnaissance of the site with historic perspective will be a part of the EIS.
13. The average daily water consumption for the property will be approximately 0.2 MGD based on Board of Water Supply Standards. This information will be a part of the EIS.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
1032

KAHALUU NEIGHBORHOOD BOARD NO. 29
c/o KAHALUU COMMUNITY CENTER
47 232 WAIHEE ROAD
KANEHOE, HAWAII 96744
IHEEIA KEA, KAHALU'U, WAIHE'E, WAIAMOLE, WAIKANE, HAKIPUU AND KO'OLAUPOKO



Date Received _____

File: _____

Action: _____

"Let us ~~not~~ ever have
an unhappy minority"

December 20, 1982

Brian L. Gray
GRAY, HONG & ASSOCIATES, INC.
116 S. King Street, Room 508
Honolulu, Hawaii 96813

Proposed Hawaiian Electric Company He'eia Kea Residential Subdivision
Tax Maps 4-6-06 & 4-6-32 Various Parcels (218.1 Acres)
He'eia, Ko'olaupoko, O'ahu, Hawai'i
Preparation of Draft Environmental Impact Statement

Gentlemen:

This letter is our response to your request for written comments relating to the preparation of a Draft Environmental Impact Statement for the proposed Residential Subdivision at He'eia Kea.

The Kahalu'u Neighborhood Board, at its meeting of December 8, 1982, thoroughly reviewed and discussed the preparation notice and hereby expresses various concerns and offers various suggestions regarding the proposed project as a whole and certain of its impacts in particular.

LAND USE CONFORMANCE/NON-CONFORMANCE

The proposed development is in conformance with the C & C General Plan which includes the site within the Windward "Urban Fringe" area and with the existing Zoning which is R-6 Residential.

However, it is not in conformance with any version of the yet unadopted Ko'olaupoko Development Plan which designates most of the site (about 85 of the 102 acres) Agriculture and is in conflict with the ALISH "other" agricultural classification of half of the site (about 50 of the 102 acres). Please refer to Exhibit I, Existing Conditions.

DEVELOPMENT SCALE

The proposed development is too large in scale with respect to the impacts on the site itself and the resulting impacts on public facilities.

The project proposes to develop the entire 102 acres within the Urban District classification. Please refer to Exhibit II, H.E.C.O. Development Plan. This would cause adverse environmental and ecological impacts on the land by requiring excessive grading cut & fill on the site which has slopes ranging from flat to 30% and by disrupting natural drainage patterns on the site which is subject to rapid

Brian L. Gray
Proposed Hawaiian Electric Company He'eia Kea Residential Subdivision
Tax Maps 4-6-06 & 4-6-32 Various Parcels (218.1 Acres)
Preparation of Draft Environmental Impact Statement
Page 2

run-off and flash flooding during frequent heavy rains. Such intense alteration of the land also may well cause unacceptable siltation in Kane'ohē Bay and degradation of its class AA Waters.

A project of this scale (418 residential units) will most certainly have adverse impacts on public facilities, particularly highways and schools. Kamehameha Highway and the He'eia Stream "Long Bridge" are one lane in each direction and are completely inadequate to handle the Kane'ohē bound traffic volumes which would result from such extensive development. There are no plans for, nor does the community desire, any highway traffic lane additions. Such a large residential development would increase school enrollments beyond the present capacities of He'eia Elementary and/or 'Ahuimanu Elementary, King Intermediate and Castle High.

Furthermore, the project proposal is premature with regard to sewage disposal. Sewer lines to wastewater treatment facilities would not serve the development site for many years. If such lines were constructed at a relatively early date they would, adversely, encourage growth and development of either rural Kahalu'u, Waihe'e & Ka'alaea or the He'eia Marshlands depending on whether the Kahalu'u or the Kane'ohē Wastewater System was used.

COMMUNITY HOUSING NEEDS

This proposed development of average market priced housing within an urban fringe area may lessen pressures for urban sprawl of such housing into rural areas. However, it would not ease the urgent need for low and moderate income housing by residents throughout the Kualoa to He'eia Community (Kahalu'u Neighborhood Board area). Nor would the project allow the current low and moderate income He'eia Kea residents to remain or relocate within the immediate area and, at the same time, retain land and the opportunity to supplement their sustenance by continuing to farm.

HE'EIA KEA BOAT HARBOR

The proposed development does not recognize the significance of the adjacent He'eia Kea Small Board Harbor. What relationship would there be between the project and the boat harbor? What impacts would the project have on the important and desirable social amenities that the current boat harbor community now enjoys? Our Kahalu'u Board has, for some time, consistently requested that additional land across Kamehameha Highway be made available for harbor support facilities such as boat trailer users and automobile parking.

ALTERNATE DEVELOPMENT CONCEPTS

The primary considerations for determining preferred alternate development concepts must be to reduce adverse impacts on the land itself, on the several public facilities and on the social fabric of the community.

We are presenting two concepts for development (there could be many more) which we feel are preferred alternatives. Please refer to Exhibits III & IV. Both

Brian L. Gray
Proposed Hawaiian Electric Company He'eia Kea Residential Subdivision
Tax Map 4-6-06 & 4-6-32 Various Parcels (218.1 Acres)
Preparation of Draft Environmental Impact Statement
Page 3

concepts are completely different. However, both consider the development of about one half the residential units proposed by the H.E.C.O. plan thus reducing the impacts on land and public facilities, and both include the retention of considerable land for agriculture thus allowing residents to relocate within the area and continue to farm. In either concept the resulting adverse impacts on the land, public facilities and the community are greatly reduced.

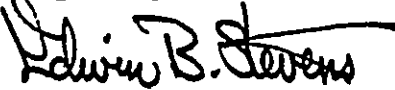
Alternate concept A (Exhibit III) concentrates rather intense residential development toward the center of the site at the lower elevations and provides agricultural activities on the periphery of the site at the higher elevations on lands which correspond with the ALISH classification "other". An advantage: little disruption of steeper slopes. A disadvantage: development concentrated in SMA lowlands.

Alternate concept B (Exhibit IV) places agricultural activities towards the center of the site which contains lands that, although not ALISH, are productive and provides cluster type residential development on the periphery of the site at the higher elevations. An advantage: agricultural lands located in SMA lowlands. A disadvantage: even cluster housing results in some adverse grading impacts.

IN CONCLUSION

We have presented and discussed a number of our concerns which must be fully addressed in the Draft and Final Environmental Impact Statements for the proposed H.E.C.O. Residential Project at He'eia Kea.

Very truly yours,



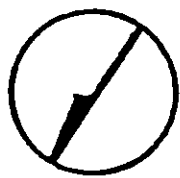
EDWIN B. STEVENS, CHAIRMAN
KAHALU'U NEIGHBORHOOD BOARD NO. 29

Letter and Materials Authorized by Motion 11-0-1
N.B.#29 Regular Meeting 12-8-82

Brian L. Gray
Proposed Hawaiian Electric Company He'eia Kea Residential Subdivision
Tax Map 4-6-06 & 4-6-32 Various Parcels (218.1 Acres)
Preparation of Draft Environmental Impact Statement
Page 4

Attachments: Exhibit I - Existing Conditions/Development Site
II - Development Plan/H.E.C.O.
III - Alternate Concept A/N.B.#29
IV - Alternate Concept B/N.B.#29

Copies: Hawaiian Electric Company, Inc.
Trustees, Bernice Pauahi Bishop Estate
Cowell & Co., Inc.
Office of Environmental Quality Control
Department of General Planning
Department of Land Utilization
He'eia Kea & Meadowlands Community Association
Hui Malama Aina O Ko'olau
Kane'ohe Neighborhood Board No. 30
Kahalu'u Neighborhood Board No. 29
- Chairman
- Growth Management Committee
Kahalu'u Community Resource Center
Neighborhood Commission



KAHALU'U NEIGHBORHOOD BOARD NO. 29
KUALOA TO HE'EIA



HE'EIA KEA

ACKSH "OTHER" SOIL CLASS
AeE

URBAN
CONSERVATION

HE'EIA
KAHALU'U

KANE'OHÉ BAY

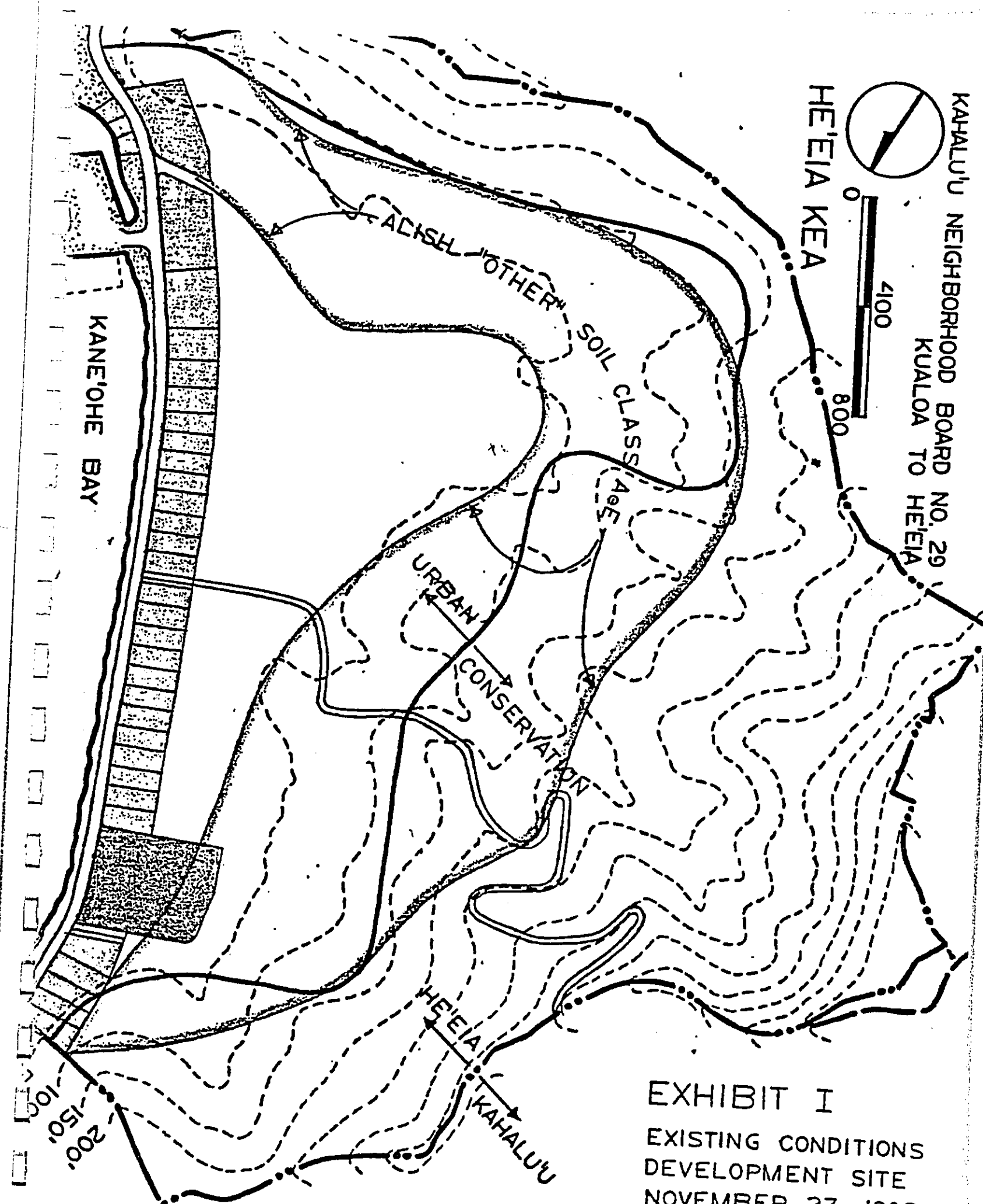
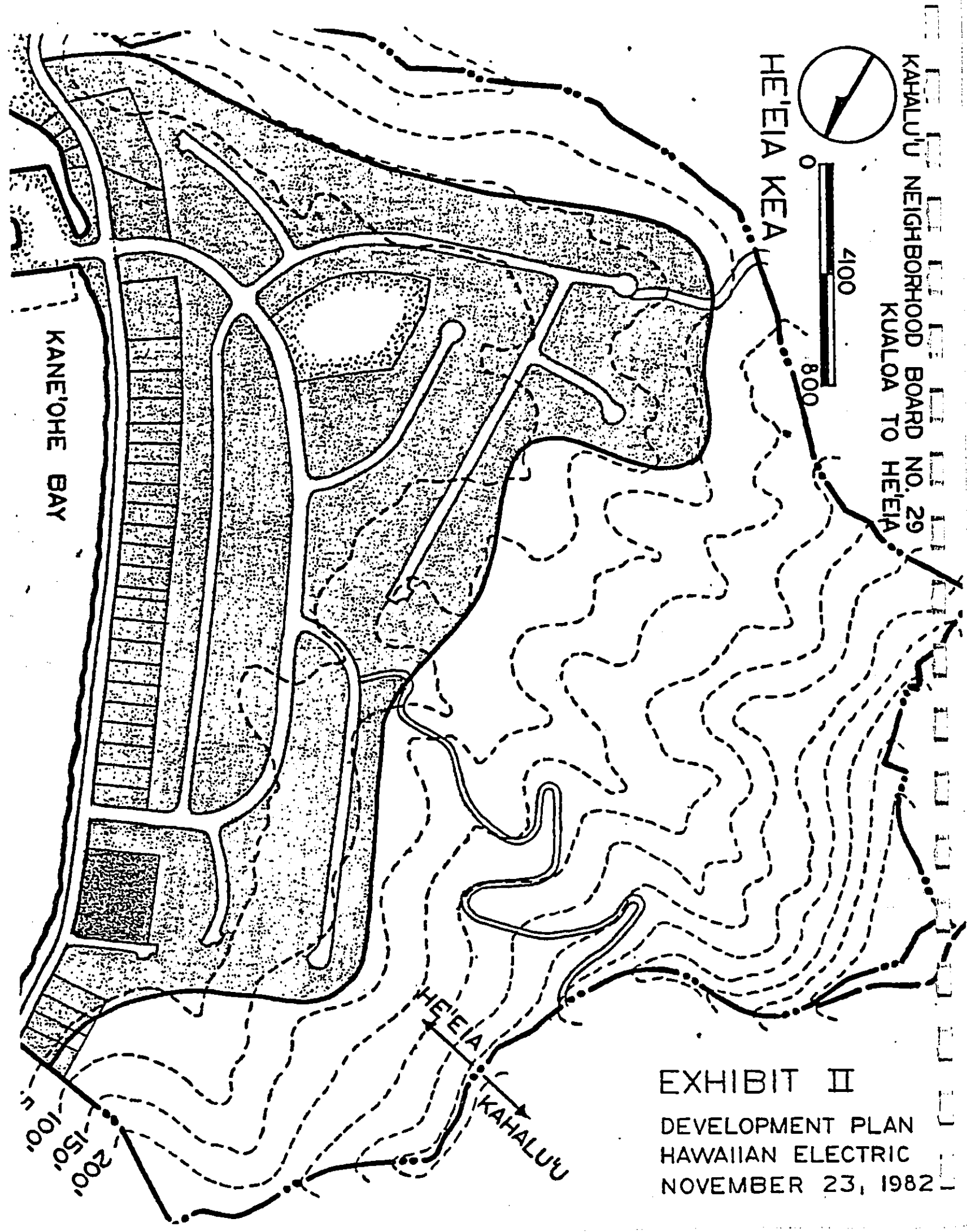


EXHIBIT I
EXISTING CONDITIONS
DEVELOPMENT SITE
NOVEMBER 23, 1982



KAHALU'U NEIGHBORHOOD BOARD NO. 29
KUALOA TO HE'EIA

HE'EIA KEA

KANE'OHE BAY

EXHIBIT II
DEVELOPMENT PLAN
HAWAIIAN ELECTRIC
NOVEMBER 23, 1982

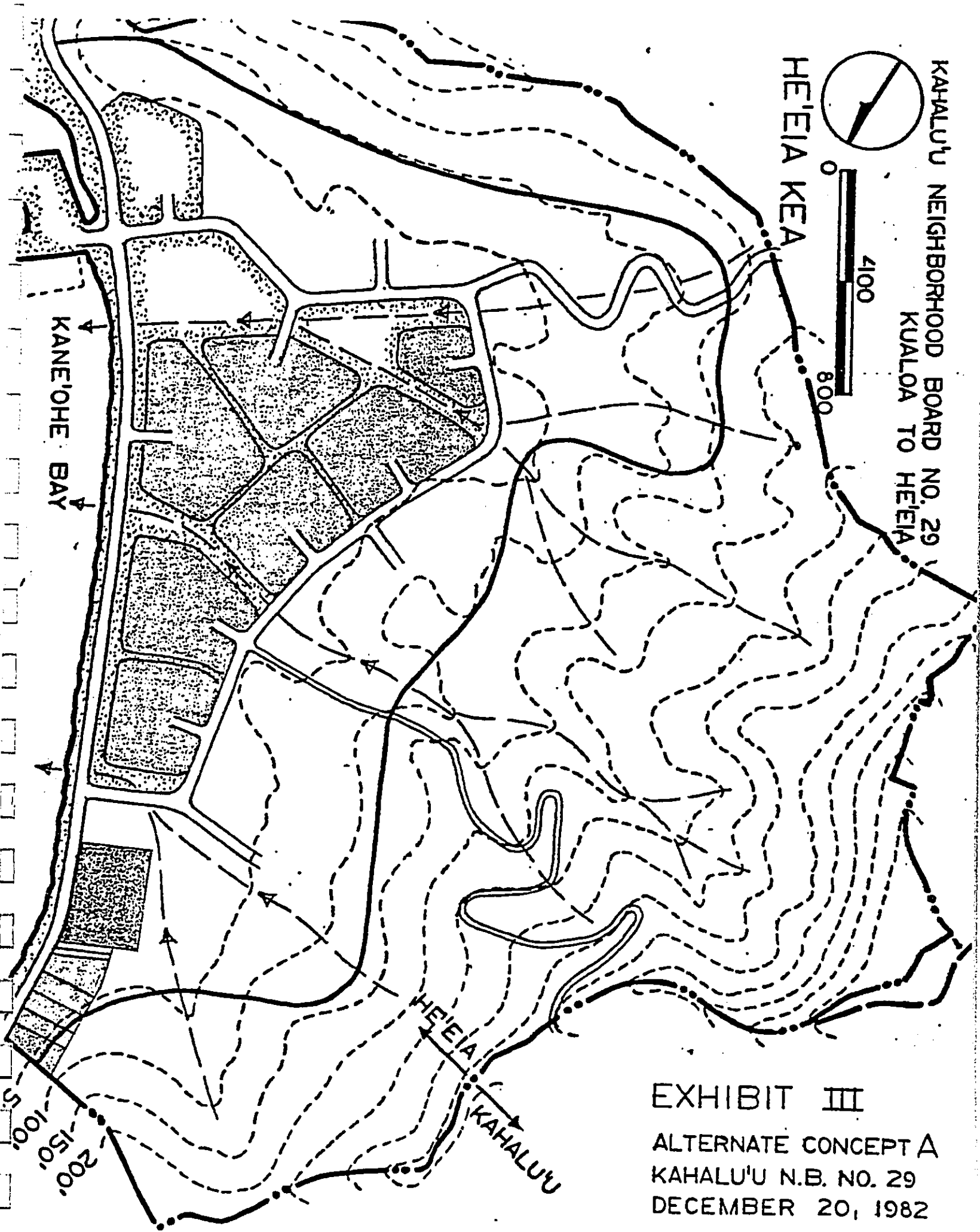
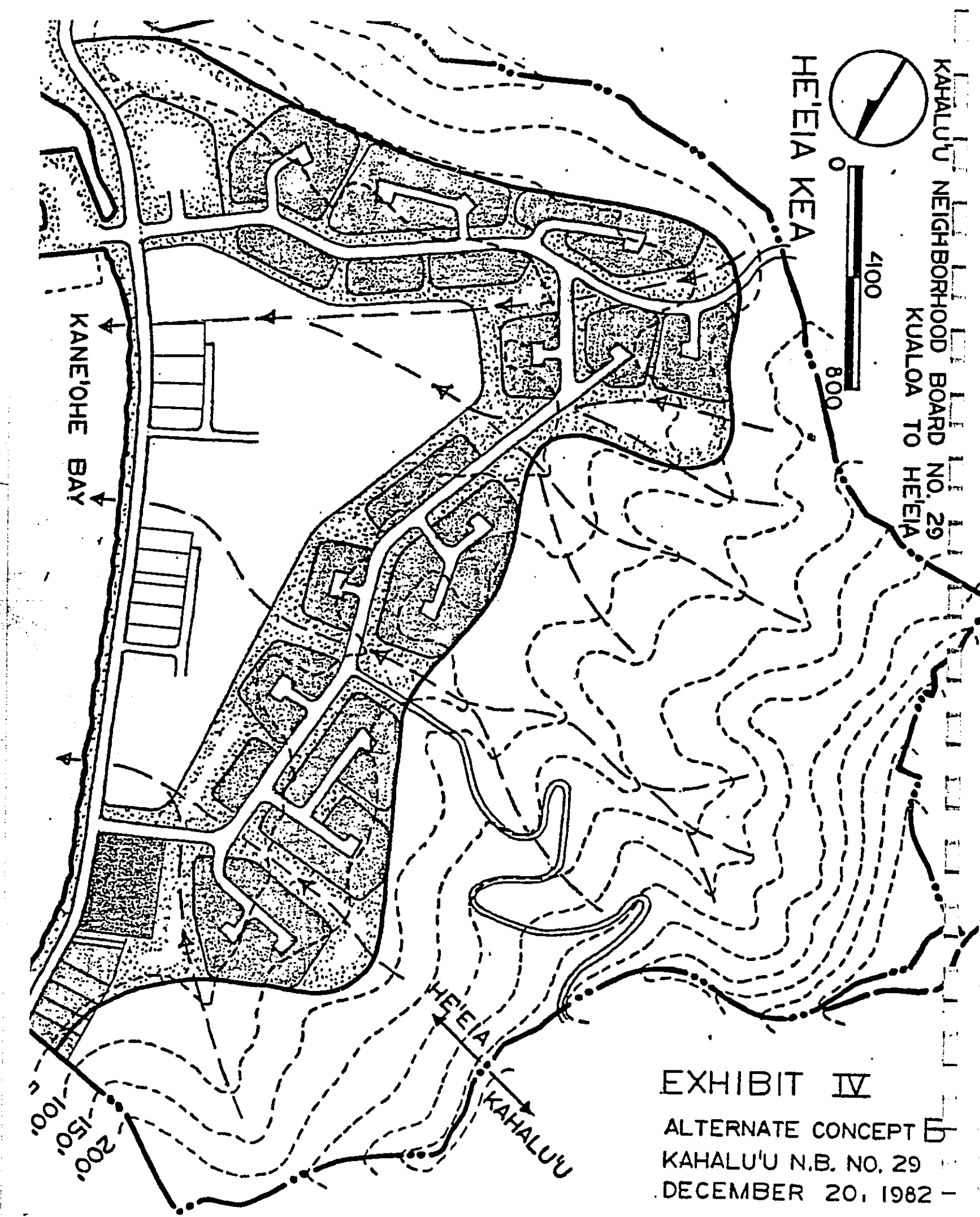


EXHIBIT III
ALTERNATE CONCEPT A
KAHALU'U N.B. NO. 29
DECEMBER 20, 1982



KAHALU'U NEIGHBORHOOD BOARD NO. 29
 KUALOA TO HE'EIA

EXHIBIT IV
 ALTERNATE CONCEPT
 KAHALU'U N.B. NO. 29
 DECEMBER 20, 1982

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Edwin B. Stevens, Chairman
Kahaluu Neighborhood Board No. 29
c/o Kahaluu Community Center
47 232 Waihee Road
Kaneohe, Hawaii 96744

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. Stevens:

We thank you for your comments dated December 20, 1982. The information you have forwarded will be made a part of the Environmental Impact Statement (EIS). The following information describes how the EIS will address the concerns which your Neighborhood Board has expressed.

Land Use Conformance/Nonconformance

The EIS will present both the existing DLUM for the area as well as the proposed Development Plan. In addition, the EIS will describe the project in relation to the Oahu General Plan, Hawaii State Plan, Special Management Area and the Coastal Zone Management Plan.

An agricultural feasibility study will also be conducted to evaluate the site and an agricultural history of the project area will be evident in the EIS. Through correspondence with the Department of Agriculture, we have been informed that approximately 25 acres of the site are "ALISH" and the Department has not anticipated any significant impact on agriculture.

Development Scale

One of the features of the EIS is to relate the proposed project to the impact on the site as well as as the resulting impact on public facilities. Any impact which you have referenced, i.e. grading, drainage, public facilities, infrastructure, will be discussed in sufficient detail and subject to review. It is our obligation to provide this information in an objective fashion to allow acceptance of the final EIS by the Department of Land Utilization. Acceptance of the document does not necessarily mean the project will make everyone happy, but rather that the facts have been reported accurately.

We have already contacted the agencies responsible for the review of water, sewers, roadways and grading as well as public facilities. We have not received any comments which support your statement regarding the size of the project. The EIS will include all correspondence from the foregoing agencies.

XI-83

Mr. Edwin B. Stevens
January 24, 1983
Page Two

Community Housing Needs

A market study is being prepared to analyze the housing demand. The project site is within the urban fringe of Kaneohe and the housing which is proposed is aimed at this market demand. The information which will be presented in the EIS does not support the idea that the site has agricultural viability.

Heeia Kea Boat Harbor

It is not anticipated that a residential subdivision across from the Boat Harbor will have a significant impact on the usage of the harbor. With respect to your Board's requests for lands mauka of Kamehameha Highway for boat harbor parking expansion, this appears to come under the jurisdiction of the State. We are not aware of this type of public facility on any land use planning document.

Alternative Development Concepts

The EIS will discuss alternatives to the proposed project. One of those alternatives will be based on a smaller scale of development. Your two (2) alternative concepts suggest a development of approximately one-half of that which is proposed. We recognize that such a reduction will minimize the potential impact to Kaneohe Bay during grading and reduce traffic congestion. However, the impact to Kaneohe Bay will be greatest when earth is exposed. Reduction in scale will shorten a temporary impact. With respect to traffic, it is projected based on a traffic analysis that the level of service will be within acceptable ranges based on the full-scale development.

It should be pointed out that the EIS is being prepared for the project as proposed. Alternatives to the development will be discussed in such a fashion as directed by EIS Rules and Regulations. If, at some point in time, it is determined that the proposed project is not feasible, alternatives can be explored.

We look forward to your review of the Draft EIS. Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
1032

Date: 12/20/82
File: _____
To: _____
Action: 20-82

Grey, Hong and Associates, Inc.

Dear Sirs,

In regards to the EIS for the proposed Heeia Kea, Hawaiian Electric development, Hui Malama Aina O' Koolau would like you to address a number of concerns.

This project is contrary to the general plan and the proposed Development Plans, which designate Heeia Kea as rural and agricultural. What is the effect on the planning process when a large developer tries to beat planning deadlines?

You say that "it is a recognized fact that there is a severe shortage of housing units on the island of Oahu." We would like to see you prove this. If there is a shortage, what kind of housing is needed for what socio-economic groups? There are presently a number of families living in this area. What provisions are you making for them?

Traffic will be greatly increased by your own admission. What will the affects be on the lives of people down the coast? How much longer will it take them to get to work? What will the traffic accident rate be like? Who will pay the cost of increased highway maintenance?

You say there is adequate water for this development. What will the cumulative effects of yours and other developments be on stream flows in light of the agricultural needs of Kahaluu and in light of the new minimum stream flow law? What will the affect be on agriculturally zoned lands which are not yet in production?

Does the construction timetable for this development realistically conform to the City's timetable for installing sewer service?

The waters off of Heeia are class AA waters. What will grading, construction, and highway and driveway runoff do to these waters?

The Heeia kea pier has gradually become more and more crowded, due to the growth of population. It is harder for part time fishermen supplementing their family incomes to get a boat slip, let alone find a place to park. How will this project affect that situation?

All of these issues must be looked at both individually and to determine the cumulative impact on the Kahaluu area. Will land values increase? What about land taxes, including inheritance taxes? How will the rural character of the rest of the community be affected by this type of project in this place?

Sincerely,
Charles Reppun
Charles Reppun, President
Hui Malama Aina O' Koolau
47-410 Lulani St,
Kaneohe, Hi. 96744

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

Mr. Charles Reppun, President
Hui Malama Aina O' Koolau
47-410 Lulani Street
Kaneohe, Hawaii 96744

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. Reppun:

We thank you for your consultation comments dated December 20, 1982. Your information and concerns will be made a part of the Environmental Impact Statement (EIS). The following information addresses your questions and provides an indication of how the EIS will attempt to answer your questions.

1. The EIS will address both the existing DLUM and the proposed Development Plan for the area. We do not believe it is either accurate or appropriate to speculate that the developer/owner is attempting to beat the planning process. The EIS will discuss the development history of the project.
2. A marketing study addressing the need for housing will be included.
3. The EIS will address the existing residents. Meetings have already been held with the Heeia Kea Community Association on this matter. One alternative is providing lots at subsidized prices, however, final resolution has not been reached.
4. A traffic study will be prepared analyzing existing and anticipated traffic. Upon the project's ultimate completion peak, hourly volumes will be equivalent to that which presently occurs on Kamehameha Highway through Kahaluu. Traveling speed should not substantially reduce and correspondingly, channelization at the main intersections will facilitate turning movements without holding up traffic. Taxes are normally the basis of payment for roadway maintenance.
5. It is generally observed that there is adequate water available within Windward Oahu to serve the island. While there have been disputes regarding the use of specific sources, i.e. Waihee Valley, this does not alter the fact that there are still additional sources available.
6. The EIS will have a section devoted to water quality. This section will assess surface water runoff to Kaneohe Bay.

XI-B4

116 SOUTH KING STREET, RM. 508, HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306

Mr. Charles Reppun
Hui Malama Aina O' Koolau
January 24, 1983
Page Two

7. It is not anticipated that the proposed Heeia Kea Subdivision will have a substantial impact on boat slips and/or parking at Heeia Kea Small Boat Harbor.
8. The area proposed for development is identified as urban fringe. The type of development will be similar in concept to other urban fringe residential areas on either side of the project along Kamehameha Highway. The site is physically separated from the area of Kahaluu which is often referred to as rural by a ridge line.
9. Land assessments by the County are based upon individual property values. Development of Heeia Kea will not necessarily increase land assessments and/or taxes for parcels in the surrounding area.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032



LIFE OF THE LAND

December 15, 1982

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street Room 508
Honolulu, Hawaii 96813

Date Recd: DEC 17 1982
File: _____
To: _____
Action: _____

Dear Mr. Gray:

Subject: EIS Preparation Notice for Heeia Kea Subdivision

Life of the Land would like to be a consulted party for the subject EIS. Please send us a copy of the Draft and Revised EIS documents when they become available.

Our three major concerns with the proposed development are:

- (1) susceptibility of the site to aircraft noise from KMCAS,
- (2) what happens to the people now living on the site, and
- (3) how will this development affect HECO's utility charges.

Apart from aircraft noise and displacement of residents, the site of the proposed residential subdivision seems a more reasonable place to accommodate population growth than other parts of rural windward Oahu. We would appreciate it if your EIS explored the desirability of additional soundproofing and the possibility of providing affordable housing for use by the current residents of the site. We also think it would be appropriate for the EIS to address the source of financing to be used for the development and how the Public Utilities Commission will treat profits realized by HECO.

Yours,

Douglas Meller
Secretary

cc: OEQC

XI-A5

250 S. Hotel St. Rm. 211, Honolulu, Hawaii 96813. Tel. 521-1300

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Life of the Land
250 South Hotel Street, Rm. 211
Honolulu, Hawaii 96813

Attention: Mr. Douglas Meller

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. Meller:

We thank you for your comments dated December 15, 1982. Your comments will be made a part of the Environmental Impact Statement (EIS). With respect to your concerns, we are providing the following information.

1. The EIS will address the existing noise levels at the site. It is the intent of the project to ensure that all applicable noise regulations are achieved for the development.
2. Cowell & Company, Inc., as consultants to Hawaiian Electric Company, Inc., have held several meetings with members of the Heeia Kea Community Association in order to find solutions to their housing problems. Preliminary conceptual proposals have been made to the Community Association where Hawaiian Electric Company, Inc. would market lots at subsidized prices to the members of the Association. The final solution regarding this matter has not been reached. However, it is the desire of Hawaiian Electric Company, Inc. and its consultants to find a viable solution that will satisfy the majority of the Association members.
3. Hawaiian Electric Company, Inc. acquired the property by a lease and agreement of sale in 1964. Since that time, about \$107,000 per annum in lease rent has been paid by shareholders of Hawaiian Electric Company, Inc. Total lease rent and other miscellaneous expenses related to the undeveloped part of the Heeia Kea property were paid solely by the shareholders. These costs now approximate two million dollars and the rate payers paid none of this.

XI-85


Mr. Douglas Meller
January 24, 1983
Page Two

Any potential development profits will be utilized to offset previous costs charged against shareholders in the past. It is important to recognize that development of the Heeia Kea property is totally out of the rate base. Therefore, there is no effect on utility charges related to the undeveloped Heeia Kea property or its potential development.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

DEC 6 1982



Date Received

File: _____

To: _____ DB

Action: _____

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

PROJECT OFFICES
WAIMEA OFFICE
P. O. BOX 125
KAMUELA, HAWAII 96743
KEAUKAHA OFFICE
P. O. BOX 833
HILO, HAWAII 96720

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

PROJECT OFFICES
MAUI OFFICE
P. O. BOX 22
KAHULUI, MAUI 96732
MOLOKAI OFFICE
P. O. BOX 198
HOOLEHUA, MOLOKAI 96729
KAUAI OFFICE
P. O. BOX 332
LIHUE, KAUAI 96766

December 3, 1982

Gray, Hong and Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Heeia Kea Subdivision
Comments on EIS

Reference is made to your letter of November 23, 1982,
requesting consultation comments in the preparation of the
Draft Environmental Impact Statement.

The Department has no comments since our lands are not
involved.

Sincerely yours,

Georgiana K. Padeken
Georgiana K. Padeken
Chairman

GKP:RF:GW:jm

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

January 24, 1983

Ms. Georgiana K. Padeken, Chairman
State of Hawaii Home Lands
P. O. Box 1879
Honolulu, Hawaii 96805


SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Ms. Padeken:

We thank you for your comments dated December 3, 1982 regarding the subject project.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-BC

116 SOUTH KING STREET, RM. 508, • HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306



Date Received DEC 14 1982

File: _____

To: D. _____

Location: _____

University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 283 • 2540 Dole Street
Honolulu, Hawaii 96822

December 10, 1982

Gray, Hong & Associates
116 South King Street, Room 508
Honolulu, Hawaii 96813

Gentlemen:

Subject: Request for Consultation Comments Draft Environmental
Impact Statement, Heeia Kea Subdivision, Heeia,
Koolaupoko, Oahu

We have received your subject request and offer the following comment. There is a distinct possibility that troublesome expanding soils may occur on the Kahuku end of your project area. This relates to soil movement and foundation problems, of course. These soils may possibly occur as pockets in the remaining area also; therefore, a close examination after grubbing would be prudent.

Sincerely,

Edwin T. Murabayashi

Edwin T. Murabayashi
EIS Coordinator

ETM: jm

XI-A7

AN EQUAL OPPORTUNITY EMPLOYER

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

University of Hawaii at Manoa
Water Resources Research Center
Holmes Hall 283
2540 Dole Street
Honolulu, Hawaii 96822

Attention: Mr. Edwin T. Murabayashi

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Gentlemen:

We thank you for your consultation comments dated December 20, 1982. A detailed soils investigation of the site will be prepared prior to the preparation of any construction plans. The recommendations of the soils investigation will be utilized for the design of pavement sections and grading controls. In addition, the recommendations will also include procedures to handle pockets of unsuitable material. In any event, it is standard procedure to require consultation with Soils Engineer if unforeseen conditions appear in the field during construction and if problems relating to soils are encountered.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-87



PODED-PV

DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858

DEC 9 1982

File: 1032
To: DB
Action: 6 December 1982

Mr. Brian L. Gray
Gray, Hong & Associates
116 S King Street, Room 508
Honolulu, HI 96813


Dear Mr. Gray:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice for Heeia Kea Residential Subdivision, Koolaupoko, Oahu. We offer the following comments:

a. The information provided in the EIS Preparation Notice is not sufficient to determine the need for Department of the Army (DA) permits. Although the project area has no streams passing through it, it is low-lying and poorly drained; indicating a high likelihood for wetland conditions. In addition, when the analysis of existing drainage structures is completed and a decision is made on replacement or addition of more structures, the need for a DA permit should be determined. The applicant should check with the Corps when more details of the project are available to determine whether DA permits are required.

b. The project site is located in Zone D, areas of undetermined, but possible, flood hazards according to the Flood Insurance Rate Map prepared by the Federal Insurance Administration.

Sincerely,


KISUK CHEUNG
Chief, Engineering Division

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army
Pacific Ocean Division
Corps of Engineers
Ft. Shafter, Hawaii 96858

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. Cheung:

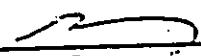
We thank you for your comments dated December 6, 1982. We are providing the following information with respect to your specific comments.

1. The Draft Environmental Impact Statement (EIS) should detail the project sufficiently to determine the need for DA permits. Based on our preliminary work which will be part of the EIS, we do not see any need for DA permits. The existing drainage structures under Kamehameha Highway appear adequate and visual observation of the site does not indicate any presence of wetland or wetland habitat within the project's boundaries. We would appreciate your close review of the draft document and field observation if necessary to satisfy yourself as to the findings which will be presented in the EIS.
2. The project site is within Zone D and there is no requirement to comply with the City and County's Flood Ordinance (Ordinance No. 80-62). However, a detailed drainage report will be required for the Special Management Permit. The EIS will contain a preliminary drainage map and analysis.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032



United States Department of the Interior

FISH AND WILDLIFE SERVICE

300 ALA MOANA BOULEVARD
P. O. BOX 50167
HONOLULU, HAWAII 96850

Date Received: _____
File: _____

IN REPLY REFER TO:

ES: _____

Room 6307

Action: _____

DEC 14 1982

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 S. King St., Rm. 508
Honolulu, Hawaii 96813

Re: EIS Preparation Notice
Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu

Dear Mr. Gray:

We have reviewed the Environmental Impact Statement (EIS) Preparation Notice for the proposed Heeia Kea Residential Subdivision. The Service recommends that the EIS evaluate the potential effects of storm runoff from the construction site and completed high-density subdivision upon the water quality of Kaneohe Bay. This analysis should consider long term effects of sediments and contaminants in urban runoff upon benthic and fisheries resources of the Bay.

To the best of our knowledge, there are no endangered or threatened species, listed, proposed, or candidate for listing, present in the proposed project area.

We appreciate this opportunity to comment. We look forward to reviewing the EIS for this action.

Sincerely yours,

Ernest Kosaka
Project Leader
Office of Environmental Services

cc: NMFS-WPPO
HDF&W
HDAR
EPA, San Francisco



XI - A9

Save Energy and You Serve America!

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

United States Department of the Interior
Fish and Wildlife Service
300 Ala Moana Blvd.
P. O. Box 50167
Honolulu, Hawaii 96850

Attention: Mr. Ernest Kosaka

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Gentlemen:

We thank you for your comments dated December 14, 1982. The Environmental Impact Statement will include both a drainage evaluation and a water quality evaluation regarding the potential impacts on the quality of Kaneohe Bay. A background literature review has found a considerable amount of information covering the water quality of Kaneohe Bay. However, the project's impact on Kaneohe Bay is directly related to near shore sedimentation. Unfortunately, there is not as much information leading to conclusions in this area. It is recognized that during the 1960's when large areas adjacent to Kaneohe Bay were being developed with no erosion controls, there was a significant sedimentation effect. The result of this type of development, in part, led to the adoption of the current requirement for erosion control. We hope you will review the draft Environmental Impact Statement and provide additional comments if you feel they are appropriate.

We generally concur with your statement that there are no endangered or threatened species on the site. However, we will have outside consultants examine the site for both flora and fauna.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-B9



United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 50006
Honolulu, Hawaii
96850

Date Received DEC 7 1982

File: 1027 10322

To: _____

Action: _____

December 16, 1982

Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Rm. 508
Honolulu, HI 96813

Subject: Heeia Kea Subdivision
Request for Comments on Draft EIS

Dear Mr. Gray:

We have reviewed the proposed subject subdivision. The soil characteristics at the site vary from slow runoff and slight erosion hazard along the shore to rapid runoff and severe erosion hazard at higher elevations according to our soil survey. We recommend a detailed engineering soils investigation prior to final design. Extreme care should be exercised on the steeper slopes to control erosion and insure that foundation conditions are adequate.

Thank you for the opportunity to review your proposal, and feel free to call us if you have any questions.

Sincerely,

Stratford L. Whiting
STRATFORD L. WHITING
District Conservationist



The Soil Conservation Service
is an agency of the
Department of Agriculture

XI-A10

SCS-AS-1
10-79

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

United States Department of Agriculture
Soil Conservation Service
P. O. Box 50006
Honolulu, Hawaii 96850

Attention: Mr. Stratford L. Whiting

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Gentlemen:

We thank you for your comments dated December 16, 1982. The Environmental Impact Statement will contain a soils description of the site. In addition, we concur that soils investigation conducted by a qualified soils engineer is necessary for implementation of the project. This is a standard procedure whenever grading is required. The soils investigation will be completed before the final design.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XT-8 10

116 SOUTH KING STREET, RM. 508, • HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306



UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION
KANEHOE BAY, HAWAII 96863

Received _____
IN REPLY REFER TO:
File: _____ PA:MAW:emh
To: DB 11010
Action: _____ 13 DEC 1982

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813


Dear Mr. Gray:

This is in response to your November 23, 1982 correspondence to the Kaneohe Bay Community Association. Although no such organization exists, I have reviewed the subject Environmental Impact Statement (EIS) Preparation Notice, and wish to call to your attention the 1976 Air Installation Compatibility Noise Zone (AICUZ) study completed for Marine Corps Air Station, Kaneohe Bay. As this study is presently being updated and the updated study has not been publicly released yet, I am enclosing a copy of your site map with the aircraft noise contours superimposed. You will note that the subject property is outside of the Ldn 65 dBA contour, but is bisected by the Ldn 60 dBA contour.

According to official Navy criteria, residential land use is clearly compatible with noise levels of Ldn 65 dBA or less. However, it is the position of some acoustical experts that due to Hawaii's outdoor lifestyle and light frame home construction, a more conservative criteria should be followed. For example, a recent land use compatibility study for the Honolulu International Airport suggested that sound insulation may need to be incorporated in new housing construction in areas exposed to Ldn 60-65 decibels. Therefore, we recommend that you give careful attention to aircraft noise and incorporate mitigation measures as necessary to achieve acceptable interior noise levels.

For further information, please contact our AICUZ Officer, Lieutenant Colonel William J. CONLEY at 257-2814.

Sincerely,


C. D. ROBINSON
Colonel, U.S. Marine Corps
Commanding

Encl:
(1) Site map

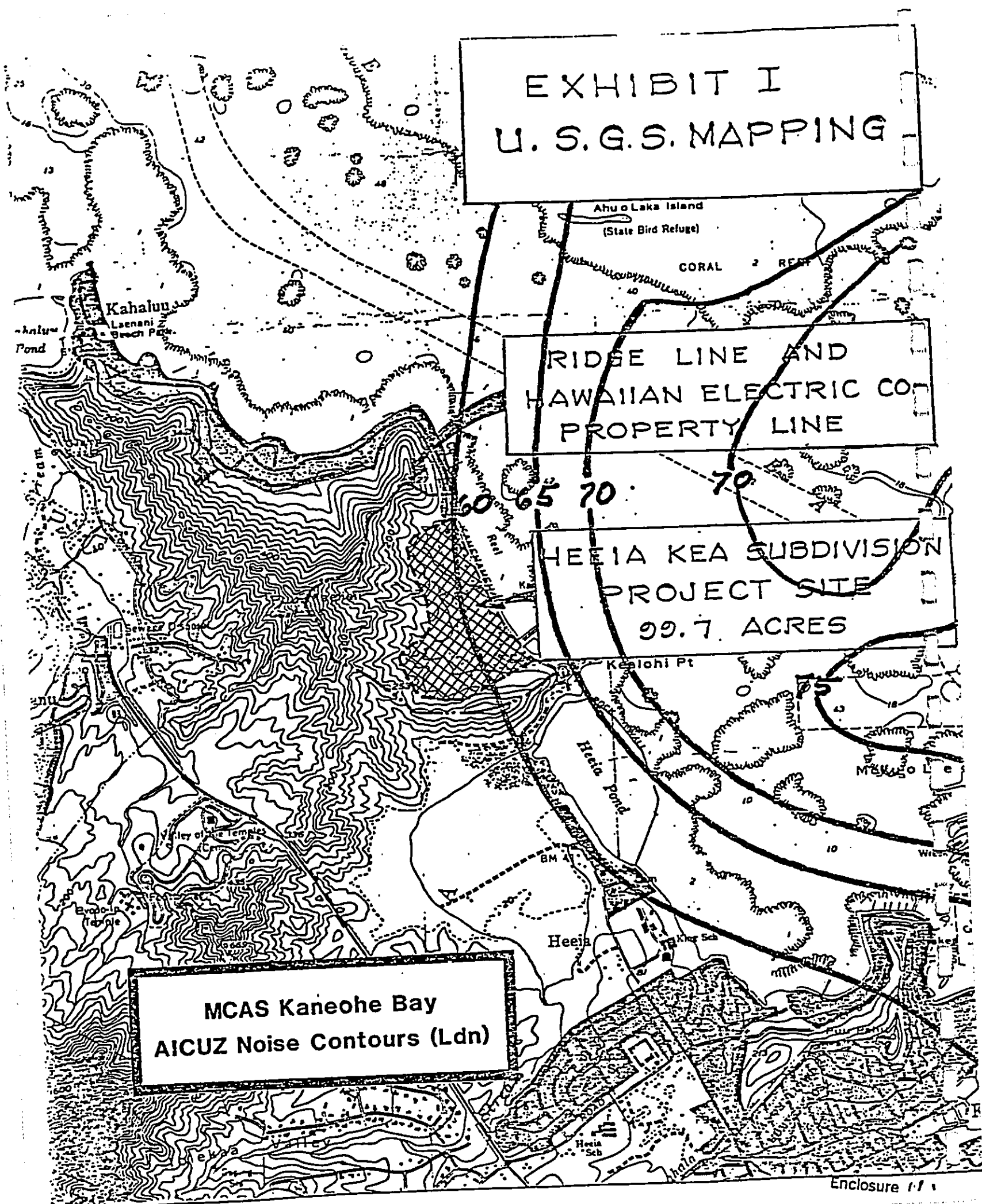
XI- A11

EXHIBIT I
U. S. G. S. MAPPING

RIDGE LINE AND
HAWAIIAN ELECTRIC CO
PROPERTY LINE

HEEIA KEA SUBDIVISION
PROJECT SITE
99.7 ACRES

MCAS Kaneohe Bay
AICUZ Noise Contours (Ldn)



GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Col. C. D. Robinson
Department of Defense
United States Marine Corps
Marine Corps Air Station
Kaneohe Bay, Hawaii 96863

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Dear Col. Robinson:

We thank you for your comments dated December 13, 1982. We will include the information regarding Ldn's for the project site and your recommendation in the Environmental Impact Statement.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-811

Citizens Against Noise

BOARD OF DIRECTORS

Joan Hayes Currie
Founder/Chairman of Board

Dan Albertson
William J. Atkinson, Jr.
Dr. Blair Bennett
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Wayne Mitter
Richard L. O'Connell
Garet Pai
Patt Patterson
James T. Shon
Charles Smalls
Ernestine Tabrah
Janet C. Swift
Barrie K. Trebor-MacConnell

DEC 20 1982
Date Received _____ 548 Kapahulu Avenue
Honolulu, Hawaii 96815
File: _____ Telephone: 735-3506
To: DE
Action: _____ December 16, 1982

Mr. Brian L. Gray
Gray, Hong & Associates Inc.
116 S. King Street #508
Honolulu 96813

Dear Brian,

These are a few comments for the Environmental Impact Statement on the Heeia Kea Subdivision.

Noise from increased traffic has to be taken into consideration. People living along Kamehameha Highway would certainly be affected.

Then there is aircraft noise from the Kaneohe Marine Corps Air Station. The navy measures aircraft noise on a yearly average basis. The 60 dBA line would go right through the Heeia Kea subdivision, and as you know, noise levels in residential areas should be no more than 55 dBA in the daytime and 45 dBA at night.

However, this yearly average by no means spells out the actual noise level inflicted on residents near the base which can at times go as high as 80 dBA.

Additional sound insulation of houses might help but with Hawaii's open air living, it doesn't make that much sense. But most important - prospective buyers should be told what to expect in the way of aircraft noise. Too often complaints are received at CAN from hapless residents who suddenly find themselves living in earsplitting discomfort when they thought they were going to move into rural peace and quiet.

Regards,

Helga
Helga Frankel
President, CAN

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Ms. Helga Frankel, President
Citizens Against Noise
548 Kapahulu Avenue
Honolulu, Hawaii 96815

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Ms. Frankel:

Thank you for your consultation comments dated December 16, 1982. The Environmental Impact Statement (EIS) will discuss noise, current standards, impacts and mitigation measures. With respect to your specific comments, we are providing the following information.

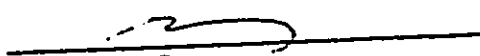
It is anticipated that the increased noise resulting from increased vehicular traffic on Kamehameha Highway will not significantly affect residences along Kamehameha Highway. Contact with the Department of Health, Noise and Radiation Branch has revealed that there are relatively few complaints regarding vehicular traffic noise from residences adjacent to roadways, such as this stretch of Kamehameha Highway. This is not to say that vehicular noise does not affect these residences but rather that vehicular noise becomes more significant when residences are located adjacent to major highways, such as interstates or multilane highways.

Aircraft noise resulting from Kaneohe Marine Corps Air Station (KMCAS) will be discussed in the EIS. KMCAS has provided our office information regarding the applicable aircraft noise standards as related to the project. We understand that the current standard regarding aircraft noise is 65 dBA based on an averaging method. We further understand that some experts would like to see the standard reduced to 60 dBA. The project site is outside the 65 dBA area, but the lower one-third of the project is within the 60 dBA area. As pointed out in your letter, the method of measurement is an averaging process and when flights pass nearby, the level can reach 80 dBA for short time periods. By comparison, the State of Hawaii has a noise level restrictions of 55 dBA (daytime) and 45 dBA (nighttime) for residential areas, however, these standards are not applicable to aircraft.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
1032

XI-812

116 SOUTH KING STREET, RM. 508, HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306



SIERRA CLUB, HAWAII CHAPTER
P.O. BOX 22897 HONOLULU, HAWAII 96822
(808) 946-8494

Date Received JAN 6 1983

File: _____
6 January 1983
To: _____
Action: _____

Gray, Hong & Associates, Inc.
116 S. King Street, Room 508
Honolulu, Hawaii 96813

Gentlemen:

We realize the enclosed comments on the EISPN for the Heeia Kea subdivision are being submitted past the deadline and we do not expect any written response.

Our request to be a consulted party still stands, however, and we hope that you can honor it.

Thank you for your consideration.

Sincerely,

Susan E. Miller

Susan E. Miller
Conservation Chairman
Honolulu Group, Hawaii Chapter

Enclosure

XI-A13



SIERRA CLUB, HAWAII CHAPTER
P.O. BOX 22897 HONOLULU, HAWAII 96822
(808) 946-8494

29 December 1982

Gray, Hong & Associates, Inc.
116 S. King Street, Room 508
Honolulu, Hawaii 96813

Gentlemen:

Sierra Club, Hawaii Chapter, asks to be a consulted party for the Draft EIS for the Heeia Kea subdivision at Heeia, Koolauoko, O'ahu.

Our particular concern is for environmental impacts on the SMA, and especially on Kane'ohē Bay. The project seems premature for existing infrastructure. The planned density is too great in an area bordering Kane'ohē Bay which includes a 200+-acre drainage basin. Previous projects in Kane'ohē and Kahalu'u have resulted in flooding and severe silting of Kane'ohē Bay when natural drainage areas were graded and filled. Live coral suffers severely by both silting and a rush of fresh water. Much less harm results if land contours are minimally disturbed.

In view of the great planned change for this area, we challenge the statement (C-8) that the "development will increase the amount of run-off entering Kane'ohē Bay by approximately 15-20%." By any reasoning and extrapolating process, the run-off would be over 100% greater.

Under 2A, Statement I should read: "The proposed project will create considerable physical impacts to the site and its surroundings."

Since this area is located in urban fringe with request for some agricultural zoning, it is reasonable to have some planned development. However, Sierra Club would like to see development less intensive and with more consideration for Kane'ohē Bay and other environmental concerns.

Sincerely,
Lola Mench
Lola Mench
Legislative Chair

CC: Department of Land Utilization,
City and County of Honolulu

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Sierra Club, Hawaii Chapter
P. O. Box 22897
Honolulu, Hawaii 96822

Attention: Ms. Susan E. Miller

SUBJECT: Heeia Kea Subdivision Environmental Impact Statement
Consultation Comments

Gentlemen:

We thank you for your consultation comments dated January 6, 1983. Even though your comments were received late, we prefer to incorporate all possible comments into the Environmental Impact Statement (EIS). As a response to your specific comments, we are providing the following information.

We are aware of the potential impact on Kaneohe Bay water quality. However, any impact will be greatest during construction when earth surfaces are exposed. If proper temporary erosion control is not utilized and high intensity rains occur, the siltation at the shoreline can be severe. However, if proper erosion control is utilized, the short-term impact will be substantially reduced. You are also correct that past projects in the Kaneohe Watershed have caused siltation to the Bay. As a result of this type of siltation and a growing awareness for the environment, regulations calling for erosion control have been adopted by the City and County. Once the grading has been completed and grassed lawns and vegetation are in place, the impact from siltation is not anticipated to be significant.


The Draft EIS will contain a preliminary hydrologic map containing existing and proposed runoff calculations. Based on straight forward hydrologic information, the increase in runoff will be approximately 15 percent.

The proposed project is not anticipated to have considerable physical impact to the site and its surroundings. The Draft EIS attempts to put the project into perspective with physical, social and environmental aspects of its surroundings. We ask your careful review of the Draft EIS with respect to the analysis presented.

Your comments and this response will be a part of the EIS. Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
1032

XI-813

GEORGE R. ARIYOSHI
GOVERNOR



Date Received 10/3/82 JACK R. SUWA
BOARD OF AGRICULTURE
File: D 13 SUZANNE D. PETERSON
DEPUTY TO THE CHAIRMAN
To: _____

State of Hawaii Action: _____
DEPARTMENT OF AGRICULTURE Mailing Address:
1428 So. King Street P. O. Box 22159
Honolulu, Hawaii 96814 Honolulu, Hawaii 96822

December 7, 1982

Mr. Brian L. Gray
Gray, Hong, & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: Request for Consultation Comments
Draft Environmental Impact Statement
Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu
TMK: 4-6-6:1,2,4,7-16,22-51
4-6-16:32

The Department of Agriculture has reviewed the subject preparation notice and offers the following comments.

According to our analysis of the property, approximately 46 acres have been classified as Other Important Agricultural Land according to the Agricultural Lands of Importance to the State of Hawaii system. Of the 46 acres, approximately 25 acres are within the project site itself.

The Soil Conservation Service Soil Survey identifies the soils as follows: 1. Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes which is used for sugarcane, truck crops, and pasture has a capability class of IIs irrigated (moderate limitations of stoniness, unfavorable texture, shallowness, or low water holding capacity) and IVs nonirrigated (very severe soil limitations because of stoniness, shallowness, unfavorable texture or low water holding capacity). 2. Mokuleia clay loam which is used for sugarcane, truck crops and pasture has a capability class of IIs if irrigated and VIs nonirrigated. 3. Alaeloa silty clay, 15 to 35 percent slopes which is used for pineapple, pasture, truck crops, and orchards, wildlife habitat and homesites has a capability class of VIe (subject to severe erosion if cultivated and not protected). 4. Lahaina silty clay, 7 to 15 percent slopes which is used for sugarcane, pineapple, truck crops, pasture, and wildlife habitat has a capability class of IIIe (subject to severe erosion if cultivated and not protected). 5. Kokokahi clay, 6 to 12 percent slopes which is used for pasture has a capability class of VIe. 6. Alaeloe silty clay 40 to 70 percent slopes which is used for pasture and wildlife habitat has a capability class of VIIe (very severely limited by risk of erosion).

XI-A14

"Support Hawaiian Agricultural Products"

Mr. Brian L. Gray
Page -2-
December 7, 1982

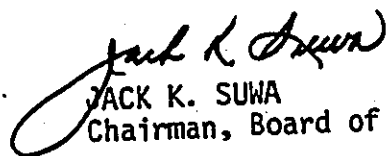
The area contains the following Land Study Bureau Detailed Land Classification ratings.

	<u>Pineapple</u>	<u>Vegetables</u>	<u>Sugarcane</u>	<u>Forage</u>	<u>Grazing</u>	<u>Orchard</u>
U	-	-	-	-	-	-
C1	c	d	d	d	b	c
D2	d	e	d	e	b	d
D8	e	d	c	b	c	c
C54	e	c	c	b	b	b
C56	b	c	d	d	b	b
C57	c	d	e	e	b	d
E106	e	e	e	e	d	e
E107	e	e	e	e	d	e

Although we do not anticipate the proposed project to have significant impacts on agriculture, we suggest that the Environmental Impact Statement address past, present, and future use of the site for agriculture, if any, as well as any potential secondary impacts the project may have on agriculture in the area.

Thank you for the opportunity to comment.

Sincerely,


JACK K. SUWA
Chairman, Board of Agriculture

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Jack K. Suwa, Chairman
Board of Agriculture
State of Hawaii
Department of Agriculture
1428 South King Street
Honolulu, Hawaii 96814

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. Suwa:

We thank you for your comments dated December 7, 1982. The text of the Environmental Impact Statement will identify the major types of soils available on the site. In addition, an outside consultant has been asked to prepare a report on the agricultural feasibility of the site.

We generally concur that the site will not have a significant impact on agriculture and the major reason for this statement is a lack of water and slope of the terrain. During the archaeological reconnaissance phase of data collection, previous uses of the site were compiled and this information will also be part of the Environmental Impact Statement. Due to the fact that the project site sits within one valley not contiguous with other agricultural operations, no significant secondary impacts are contemplated.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-B14

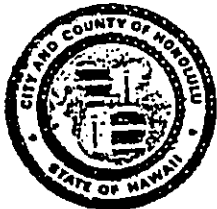
DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

DEC 20 1982

DB

EILEEN R. ANDERSON
MAYOR



WILLARD T. CHOW
CHIEF PLANNING OFFICER

RALPH PORTMORE
DEPUTY CHIEF PLANNING OFFICER

DGP11/82-4081

December 17, 1982

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Heeia Kea Subdivision

Assessment of the project's impact on community school facilities, and police and fire protection should also be included in the EIS.

Otherwise, we feel the preparation notice adequately identifies the various environmental concerns on a broad basis. Discussion of these concerns, with the inclusion of information from other detailed studies enumerated in the report regarding the extent and magnitude of each problem, and provisions of measures to minimize adverse effects should constitute an adequate basis for evaluation of the proposed project.

Sincerely,

Ralph Kawamoto

RALPH KAWAMOTO
Planner

APPROVED:

W.T. Chow

WILLARD T. CHOW

XI-A15

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Department of General Planning
City and County of Honolulu
650 South King Street, 8th Floor
Honolulu, Hawaii 96813

Attention: Mr. Ralph Kawamoto

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Gentlemen:


We thank you for your consultation comments dated December 17, 1982. The Environmental Impact Statement (EIS) will include an assessment on community school facilities, and police and fire protection. We have also asked the Department of Education, the Police Department and Fire Department to provide consultation comments to be used in preparation of the Draft EIS. While allowing flexibility to the development schedule, it is presently anticipated that the project will be implemented in 3 to 5 phases over approximately 6 to 10 years. This type of growth should not cause any drastic short-term impact to any of the facilities or departments you have referenced. Gradual growth should also allow planned development of necessary facilities not just limited to school facilities, police and fire protection.

The EIS will contain detailed reports and discussions on areas where impacts are anticipated. The discussions will include a definition of the impact as well as mitigation measures to minimize each impact.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-B 15

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

DEC 27 1982

Date:

File:

To:

DE

Jacqueline Parnell
DIRECTOR

Action:

TELEPHONE NO.
548-8915

December 22, 1982

Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: Preparation Notice for the Proposed Heeia Kea Subdivision

We would like to see emphasis placed on the items which will be major impacts to the Special Management Area and the Shoreline Setback Variance as you have identified under "Affected Environment."

Thank you for the opportunity to comment on your preparation notice.

Sincerely,

A handwritten signature in cursive script that reads "Jacqueline Parnell".

Jacqueline Parnell
Director

XI-A16

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Ms. Jacqueline Parnell, Director
State of Hawaii
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Dear Ms. Parnell:

We thank you for your consultation comments dated December 22, 1982. The Environmental Impact Statement is intended to be comprehensive. Therefore, factors not considered to have major impacts are discussed briefly and factors considered to have more significant impacts are discussed in detail. Areas which will be discussed in more detail are water quality, traffic, drainage and noise.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-116

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

January 7, 1983

Date Received 1/7/1983

File: 1032

To: JB CHARLES G. CLARK
DIRECTOR OF HEALTH

Action: cc: B. Dozube ✓
JOHN F. CHALMERS, M.D.
DEPUTY DIRECTOR OF HEALTH

HENRY N. THOMPSON, M.A.
DEPUTY DIRECTOR OF HEALTH

MELVIN K. KOIZUMI
DEPUTY DIRECTOR OF HEALTH

ABELINA MADRID SHAW, M.A., J.D.
DEPUTY DIRECTOR OF HEALTH

In reply, please refer to:
File: EPHS-SS

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 S. King St., Rm. 508
Honolulu, Hawaii 96813

Subject: Request for Comments on Proposed Environmental Impact Statement
(EIS) for Heeia Kea Subdivision, Heeia, Koolauoko, Oahu

Thank you for allowing us to review and comment on the subject proposed EIS.

Since all drainage from the proposed project will enter Kaneohe Bay (Class AA waters) and the amount of runoff from the project site entering the Bay will be increased by approximately 15 to 20 percent, the environmental impact on the receiving water quality will be quite significant. Storm runoff generated on the site should be minimized by implementing storm runoff retention measures. Excessive soil disturbance should not be allowed to occur on sites so steep that soil and water cannot be retained.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,

MELVIN K. KOIZUMI
Deputy Director for
Environmental Health

XI-A17

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Mr. Melvin K. Koizumi
Deputy Director for Environmental Health
State of Hawaii
Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

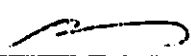
Dear Mr. Koizumi:

We thank you for your comments dated January 7, 1983. Unfortunately, your comments were received in our office on January 17, 1983. The cut-off date for receipt of comments was December 23, 1982. Your comments are similar enough in nature to other comments and your concerns will be addressed in the Environmental Impact Statement.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

VI- B17



DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

AMAMAIL BUILDING, 250 SOUTH KING ST, HONOLULU, HAWAII • MAILING ADDRESS: P.O. BOX 2352, HONOLULU, HAWAII 96804

Date Received _____
GEORGE R. ARIYOSHI
GOVERNOR
HIDETO KONO
DIRECTOR
FRANK SKRIVANEK
DEPUTY DIRECTOR

December 17, 1982

Action: _____

Ref. No. 6908

Mr. Brian L. Gray
Gray, Hong and Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: EIS Preparation Notice Heeia Kea Subdivision, Heeia,
Koolaupoko, Oahu

We have reviewed the subject preparation notice and offer the following comments with respect to the relevant objectives and policies of the Hawaii Coastal Zone Management (CZM) Program.

Coastal Ecosystems: Preserve valuable coastal ecosystems of significant biological or economic importance.

The preparation notice references potential physical impacts during construction, including 40,000 cubic yards of earth work over a two to four year construction period and a permanent increase in site runoff of 15 to 20 percent. We recommend that the EIS fully address both the short and long term impacts on the adjacent Class AA waters of Kaneohe Bay and where appropriate, identify proposed mitigating measures.

Coastal Hazards: Control development in areas subject to storm wave, tsunami, flood erosion, and subsidence hazard; ensure that developments comply with requirements of the flood insurance plan.

The area proposed for development ranges in elevation from 5 to 170 feet. Flood maps describe the area as being possibly susceptible to flood hazards. In view of the low-lying lands makai of the site, it is recommended that an assessment of potential impact from coastal hazards be addressed and appropriate mitigation measures identified.

We note that Part II of the preparation notice identifies other potential impacts that are relevant to CZM objectives and policies and indicates that the final EIS will address these impacts as well as measures for mitigation.

Thank you for the opportunity to comment.

Sincerely,


Hideto Kono

cc: Office of Environmental Quality Control

XI-A18

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

Mr. Hideto Kono, Director
State of Hawaii
Department of Planning and
Economic Development
Kamamalu Building
250 South King Street
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. Kono:


We thank you for your comments dated December 17, 1982. The Environmental Impact Statement will analyze earthwork quantities and surface runoff with respect to short and long term impacts on Kaneohe Bay. In general terms, the likelihood of impacts on the Bay are greatest during construction period when earth is exposed. Temporary retention of stormwater for the purpose of filtering out sediments is proposed. After earthwork is completed and vegetation cover is restored, no critical impact is anticipated from surface runoff. A section of the Environmental Impact Statement has been devoted to analyze this area. This section discusses sedimentation in both qualitative and quantitative terms.

The project is not subject to storm waves or tsunami inundation. However, a drainage report will be prepared and processed for the site to analyze surface water runoff. The Environmental Impact Statement will contain preliminary information regarding drainage which will be the basis for the drainage report.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI- B18

1 5 1982

Date Received _____

File: _____

To: _____

Action: _____

WALTER J. ...
JAMES P. ...
JAMES P. ...
JONATHAN K. ...

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
609 FOUNDEDOWL STREET
HONOLULU HAWAII 96813

IN REPLY REFER TO:

STP 8.8785

December 8, 1982

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Request for Consultation Comments
Draft Environmental Impact Statement
Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu

The proposed subdivision is not anticipated to directly affect our existing and future highway programs.

The proposed roadway accesses affect a section of Kamehameha Highway which is under the jurisdiction of the City and County of Honolulu.

Very truly yours,

Jonathan K. Higashionna
for Jonathan K. Higashionna
Ryokichi Higashionna
Director of Transportation

XI-A19



GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Mr. Ryokichi Higashionna, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Dear Mr. Higashionna:

We thank you for your consultation comments dated December 8, 1982. We have contacted the appropriate agencies with the City and County of Honolulu for consultation comments regarding this project.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-819

GEORGE R. ARIYOSHI
GOVERNOR

DR. DONNIS H. THOMPSON
SUPERINTENDENT



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

Date Received DEC 27 1982
File: _____
To: DB
Action: _____

OFFICE OF THE SUPERINTENDENT

December 20, 1982

Mr. Brian L. Gray
Gray, Hong, & Associates, Inc.
116 South King Street, Room 508
Honolulu, HI 96813

Dear Mr. Gray:

SUBJECT: Heeia Kea Subdivision

Our review of the proposed subject subdivision indicates that the student enrollment generated by the 390-unit development will be as follows:

<u>SCHOOL</u>	<u>GRADE</u>	<u>APPROXIMATE ENROLLMENT</u>
Heeia Elementary	K-6	40 - 100
King Intermediate	7-8	10 - 25
Castle High	9-12	15 - 40

The above listed schools are capable of accommodating the projected student enrollment increases. If there are any questions, please contact Mr. Howard Lau at 737-5231.

Sincerely,

Donnis H. Thompson
Donnis H. Thompson
Superintendent of Education

DHT:HL:j1

cc: Windward District

XI-A20

AN EQUAL OPPORTUNITY EMPLOYER

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Ms. Donnis M. Thompson, Superintendent
State of Hawaii
Department of Education
P. O. Box 2360
Honolulu, Hawaii 96804

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Dear Ms. Thompson:

We thank you for your comments dated December 20, 1982. The information provided will be made a part of the Environmental Impact Statement.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XT-820

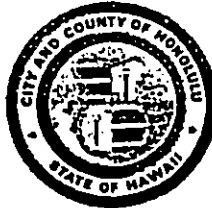
DEPARTMENT OF HEALTH
CITY AND COUNTY OF HONOLULU
1455 S. BERETANIA STREET
HONOLULU, HAWAII 96814

Date Received DEC 23 1982

To: DB

Action: _____

EILEEN R. ANDERSON
MAYOR



ANNA MARIA BRAULT, M.D.
DIRECTOR

DOROTHY K. ONO
DEPUTY DIRECTOR

December 20, 1982

Gray, Hong & Associates, Inc.
Consulting Engineers
116 South King Street, Room 508
Honolulu, HI 96813

Dear Sirs:

We have reviewed the draft environmental impact statement for the Heeia Kea Subdivision, Heeia, Koolaupoko, Oahu and our capabilities can respond to emergency ambulance service requests from the additional 418 residential home owners from this new subdivision.

Sincerely,

Anna Maria Brault
ANNA MARIA BRAULT, M.D.
Director

XI-A21

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Dr. Anna Maria Brault, Director
Department of Health
City and County of Honolulu
1455 S. Beretania Street
Honolulu, Hawaii 96814

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

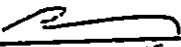
Dear Dr. Brault:

We thank you for your comments dated December 20, 1982. The information which you have provided will be made a part of the Environmental Impact Statement.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-B21

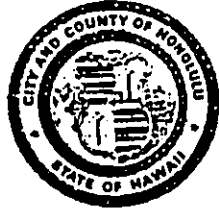
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4161

To: _____

Action: _____

EILEEN R. ANDERSON
MAYOR



JOSEPH K. CONANT
DIRECTOR

CHARLES K. TORIGOE
DEPUTY DIRECTOR

December 17, 1982

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: Request for Consultation Comments
Draft Environmental Impact Statement
Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu

Thank you for forwarding the subject preparation notice for our review and comment.

We have no objections or substantive comments to offer at the present time.

Sincerely,

for Charles K. Torigoe
JOSEPH K. CONANT

XI-A22

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

January 24, 1983

Mr. Joseph K. Conant, Director
Department of Housing and
Community Development
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

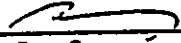
Dear Mr. Conant:

We thank you for your comments dated December 17, 1982. Your correspondence will be made part of the Environmental Impact Statement.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-822

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

DEC 27 1982

Date Received _____

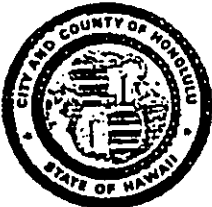
File: _____

To: _____

Action: _____ ROY A. PARKER
DIRECTOR

_____ GIL RHEE
DEPUTY DIRECTOR

EILEEN R. ANDERSON
MAYOR



TE 11/82-5635

December 17, 1982

Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Gentlemen:

Subject: EIS Preparation Notice for Heeia Kea Subdivision

We have the following comments on the project:

1. The area is served by City Bus Route 52. The EIS should describe existing service and analyze the impact of this project on the bus service.
2. A capacity analysis for the a.m. and p.m. peak hours should be provided for the Kamehameha-Haiku Road intersection. This analysis should include the traffic that will be generated by the project.
3. We believe that frontage improvements along Kamehameha Highway will be needed to support the proposed project. In order to implement a 60-foot roadway for Kamehameha Highway, a 10-foot widening is required from the mauka frontage.

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

Very truly yours,


ROY A. PARKER
Director

XT-A23

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Roy A. Parker, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mr. Parker:

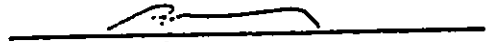
We thank you for your consultation comments dated December 17, 1982. In response to your comments, we are providing the following information which will be a part of the Environmental Impact Statement (EIS).

1. Bus service will be discussed in the EIS.
2. The peak hour capacity of Kamehameha Highway has been analyzed under existing conditions as well as when the project is ultimately completed. A section of the EIS is devoted to traffic.
3. We understand that your Department is adhering to a policy that a 60-foot roadway is the appropriate master-planned width for Kamehameha Highway. However, for the purpose of clarification, the proposed subdivision does not front Kamehameha Highway. There are approximately 32 existing lots fronting Kamehameha Highway. In accordance with Subdivision Rules and Regulations, only streets abutting or within the subdivision are proposed for improvements. Therefore, even though the EIS analyzes traffic on Kamehameha Highway, considerations for widening have not been made a part of this project.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

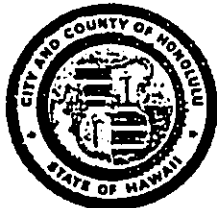
1032

XI-823

116 SOUTH KING STREET, RM. 508, • HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
680 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

Date Received _____

File: _____ 10:32

To: _____ DB

Action: _____

ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT

WILLIAM F. REMULAR
DEPUTY DIRECTOR

PB 82-1171

December 13, 1982

Mr. Brian Gray
Gray, Hong & Associates, Inc.
116 S. King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: Environmental Impact Statement
Preparation Notice
Proposed Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu

We have reviewed the subject preparation notice and have no comments at this time.

Thank you for the opportunity to comment on the proposed subdivision.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Roy H. Tanji".

ROY H. TANJI
Director and Building Superintendent

cc: J. Harada
H. Muraoka

XI-A24

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Mr. Roy H. Tanji
Director & Building Superintendent
Building Department
City and County of Honolulu
650 South King Street, 2nd Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Dear Mr. Tanji:

We thank you for your consultation comments dated December 13, 1982.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

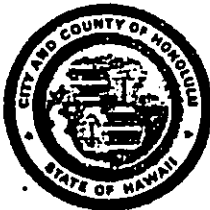
DB:crd

cc: Cowell & Company, Inc.

1032

XT-B24

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

DEC 20 1982
Date Received _____

To: DE

Action: _____

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

WILLIAM A. BONNET
DEPUTY DIRECTOR

ENV 82-440

December 16, 1982

Gray, Hong and Associates, Inc.
116 South King Street, Room 508
Honolulu, HI 96813

Gentlemen:

Subject: Draft Environmental Impact Statement
Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu

We have reviewed the subject preparation notice and offer the following comments.

1. Permanent measures to control increase on runoff and siltation at Kaneohe Bay should be evaluated and addressed.
2. A drainage report for the subject development is required.
3. The proposed development is tributary to the Kaneohe Sewage Treatment Plant. A permanent pump station, near the existing privately maintained Alii Bluffs pump station, will have to be constructed before the subdivision can be serviced.

Me ke aloha pumehana,

A handwritten signature in cursive script, appearing to read "Michael J. Chun".

MJC MICHAEL J. CHUN
Director and Chief Engineer

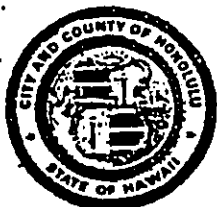
cc: Div. of Wastewater Management
Div. of Engineering

XI-A25

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU

1465 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 - AREA CODE (808) 955-8111

EILEEN R. ANDERSON
MAYOR



OUR REFERENCE MS-ES

December 7, 1982

DEC 9 1982
Date Received _____

File: 1032 FRANCIS KEALA
CHIEF

To: DB

Action: _____

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

We have reviewed your Environmental Impact Statement Preparation Notice concerning the proposed Heeia Kea Residential Subdivision.

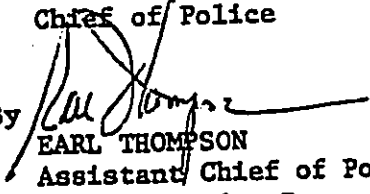
Our major concern for this project is traffic safety. Kamehameha Highway at this location is a narrow, winding road. The addition of several major intersections with left storage lanes for site access could cause hazardous conditions without highway widening, which is not anticipated. A thorough analysis of the impact of this project on traffic is recommended.

Our secondary concern is the anticipated increase in demand for police services to the project area. The substantial increase in resident population will also increase the police workload at the Kaneohe Station.

We look forward to receiving further information about this development in the future.

Sincerely,

FRANCIS KEALA
Chief of Police

By 
EARL THOMPSON
Assistant Chief of Police
Administrative Bureau

XI-A26

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Dr. Chun:

We thank you for your consultation comments dated December 16, 1982. With respect to your comments, the Environmental Impact Statement (EIS) will contain the following information.

1. The EIS will contain a preliminary hydrologic map to identify the anticipated increase in runoff. In addition, the EIS will contain a description of the erosion control measures proposed for the site.
2. The information contained in the EIS regarding drainage will be the basis for a drainage report. However, the actual drainage report for the project will be submitted to your office for approval prior to submission of the Special Management Permit application.
3. The existing sewer facility plans for the project area identify two (2) alternatives for connection to the City sewer system. We plan on identifying both alternatives in the EIS. However, based on your comment that a permanent pump station will have to be constructed near the existing Alii Bluffs Sewage Pump Station, it appears that the Heeia-North Subarea Alternate #1 is the preferred method to sewer the area.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
1032

XI-825

116 SOUTH KING STREET, RM. 508, HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0308

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA
HONOLULU, HAWAII 96843

Date Received JEC 15 1982 EILEEN R. ANDERSON, Mayor
File: 173 YOSHIE H. FUJINAKA, Chairman
ROBERT A. SOUZA, Vice-Chairman
MICHAEL J. CHUN
WALTER A. DODS, JR.
RYOKICHI HIGASHIONNA
DONNA M. HOWARD
December 8, 1982 To: DE Milton J. Agader
KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Rm. 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: Your Letter of November 23, 1982,
on the Environmental Impact Statement
Preparation Notice for Heeia Kea
Subdivision (TMK: 4-6-06:1, 2, 4,
7-16, 22-51, and 4-6-16:32)

Thank you for allowing us to review the environmental
assessment for the proposed subdivision. We have the
following comments on the proposed project:

1. A water master plan must be submitted for our review and approval.
2. A reservoir will be required to serve the subdivision.
3. We are not making advance water commitments for proposed development projects. Water availability for this project will be determined when the construction plans are submitted for our review and approval. If water is made available for the project, the developer will be assessed our water development charge to provide service to the subdivision.
4. The City's Department of Land Utilization must approve the development plans before we will take action on the proposed development.

If you have any questions, please contact Lawrence Whang at 548-5221.

Very truly yours,



KAZU HAYASHIDA
Manager and Chief Engineer

XI-A27

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Francis Keala, Chief of Police
Police Department
City and County of Honolulu
1455 South Beretania Street
Honolulu, Hawaii 96814

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Chief Keala:

We thank you for your comments dated December 7, 1982. The Environmental Impact Statement for this project will have a traffic study to analyze traffic growth, congestion and turning actions. We share your concern that safety is the prime concern. Utilization of turning lanes and acceleration and deceleration lanes is the practical method to handle increased traffic and minimize congestion.

We realize that the proposed project will create a greater demand for police services in the area. However, it is presently anticipated that the project will be implemented in 3 to 5 phases over an approximate 6 to 10-year period. The increased workload will be gradual for your Department and it is reasonable to assume taxes generated from the project will be used to increase work force.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI- B26

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

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

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments


Dear Mr. Hayashida:

We thank you for your consultation comments dated December 8, 1982. Your requirements will be made a part of the Environmental Impact Statement.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

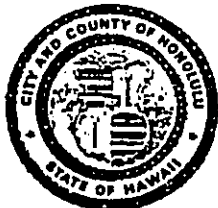
1032

XI-B27

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR



Date Received DEC 14 1982

File: _____ EMIKO I. KUDO
DIRECTOR

To: _____ SAM L. CARL
DEPUTY DIRECTOR

Action: December 10, 1982
OSCAR K. ASAHINA
EXECUTIVE ASSISTANT

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Dear Mr. Gray:

SUBJECT: RECREATIONAL ASSESSMENT
ENVIRONMENTAL IMPACT STATEMENT PREPARATION REPORT
TMK: 4-6-06: 1, ET AL. & 4-67-16: 32

We have reviewed the Environmental Impact Statement Preparation Notice for the Heeia Kea Subdivision and make the following comments and recommendations.

The proposed project, which includes more than 400 lots, will have a significant impact on our public parks in this area. The nearest public parks, Heeia Playground and Kahaluu Field, are located over two miles away and could not effectively serve the future residents of this project. The designation of 3.5 acres for a park site is commendable and it could fulfill the recreational requirements if properly planned.

The report does not indicate whether the proposed 3.5-acre park will be developed as a public or private park. This determination should be made and included in the Draft EIS. In either case, the park could satisfy the requirements of the City's Park Dedication Ordinance No. 4621. It will be necessary to coordinate with our Department to establish the configuration, location and suitability of the park site to meet the park dedication and City standards and requirements. This should be done well in advance of any permit applications in order to avoid a delay in our Department approval.

Since the lands surrounding the project are designated conservation, we recommend that the preparation notice be referred to the State Department of Land and Natural Resources for their comments also.

Please contact Mr. Jason Yuen of our Advance Planning Section at 523-4695 to discuss the project's park dedication and City's requirements.

Sincerely yours,

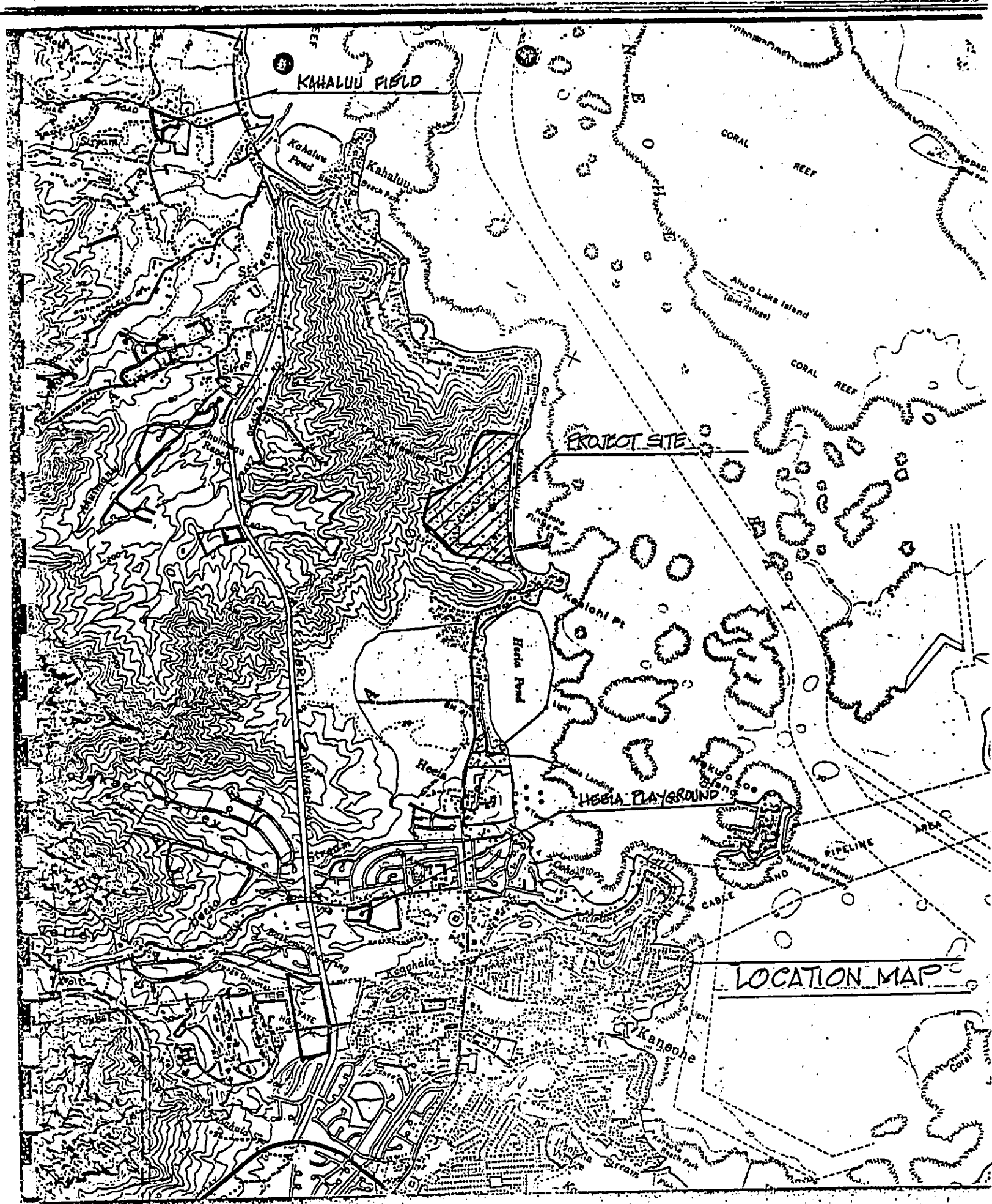
A handwritten signature in cursive script, appearing to read "Emiko I. Kudo".

(Mrs.) EMIKO I. KUDO, Director

EIK:vc

Attach.

XI-A28



GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

January 24, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mrs. Emiko I. Kudo, Director
Department of Parks and Recreation
City and County of Honolulu
650 South King Street, 9th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

Dear Mrs. Kudo:

We thank you for your consultation comments dated December 10, 1982. We concur that the project, when ultimately completed, will create a demand on the City's public park system. However, it is the intent to develop the park area in a suitable fashion to meet the subdivision's needs as well as comply with the City's Park Dedication Ordinance.


It will probably not be possible to make a determination as to whether the park will be public or private by the time of submittal for the Draft Environmental Impact Statement. However, this does not change the intent of the park facilities.

The State Department of Land and Natural Resources has also been forwarded the Preparation Notice as well as a request for consultation comments.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XI-B28

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

January 24, 1983

Mr. Melvin M. Nonaka, Fire Chief
Fire Department
City and County of Honolulu
1455 S. Beretania Street, Room 305
Honolulu, Hawaii 96814

SUBJECT: Heeia Kea Subdivision
Environmental Impact Statement
Consultation Comments

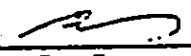
Dear Mr. Nonaka:

We thank you for the consultation comments dated December 20, 1982. The information which you have provided will be made a part of the Environmental Impact Statement. All on-site fire hydrants as well as water system will conform to the standards of the Board of Water Supply.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

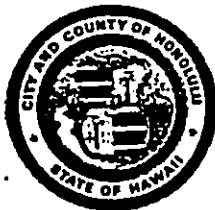
1455 S. BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814

To: _____

Action: _____

M. M. NONAKA
CHIEF

EILEEN R. ANDERSON
MAYOR



December 20, 1982

Mr. Brian L. Gray, PE
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

SUBJECT: Request for Consultation Comments
Draft Environmental Impact Statement
Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu

Dear Mr. Gray:

Fire protection services for the subject project are available from Kaneohe Fire Station with a response time of approximately 4 minutes. Supportive services are available from Kahaluu Fire Station, which is approximately 4 miles away with a response time of 5 - 6 minutes. In accordance with the fire grading schedule established by the Insurance Services Office and the National Fire Protection Association, adequate protection for the subject project is available.

We strongly recommend that all fire hydrants conform to standards established by the Board of Water Supply for proposed subdivisions.

Should you need further information, please contact Battalion Chief Norman Wilson at 955-8304.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Melvin M. Nonaka".

Melvin M. Nonaka,
Fire Chief

MMN:ct/NSW

XI-A29

XII. LIST OF NECESSARY APPROVALS

A. Federal Government

Compliance with nation-wide General Department of the Army Permit*

B. State of Hawaii

1. Department of Health - Noise Permit, Construction Plan Approval

2. Department of Land and Natural Resources - Conservation District Use Permit*

C. City County of Honolulu

1. City Council - Special Management Area Use Permit Shoreline Setback Variance*

2. Department of Land Utilization - Subdivision Approval, Construction Plan Approval

3. Department of Public Works - Grading Permit, Construction Plan Approval.

4. Department of Transportation Services - Construction Plan Approval

5. Board of Water Supply - Construction Plan Approval

6. Department of Parks and Recreation - Construction Plan Approval.

D. Private

1. Hawaiian Electric Company - Construction Plan Approval

2. Hawaiian Telephone Company - Construction Plan Approval.

*These approvals are listed but not anticipated as being necessary and are subject to the processing of a Drainage Report with the City and County of Honolulu. Approvals relate to the need for box-culvert improvements within Kamehameha Highway.

XIII. ORGANIZATIONS AND PERSONS INVOLVED IN THE PUBLIC REVIEW PERIOD

Included within this section are all comments received during the thirty (30) day review period as well as the responses to those comments. The review comments have resulted in changes to the text of the Draft EIS summarized below:

1. Board of Water Supply requirements have been clarified with respect to reservoir capacity.
2. Department of Public Works requirements with respect to sewerage system connection have been clarified.
3. The Revised EIS states that intersection improvements at Kamehameha Highway will be done by the developer at the developer's expense.
4. An alternative to the proposed action discussing cluster housing has been addressed.
5. Mitigation measures with respect to archaeological sites have been specifically addressed.

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

March 21, 1983

Mr. Ralph Kawamoto, Planner
Department of General Planning
City and County of Honolulu
650 South King Street, 8th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Kawamoto:

Thank you for your comments dated March 9, 1983 regarding the Draft Environmental Impact Statement (EIS) for the Heeia Kea Subdivision. It should be noted that we received this letter after March 10, 1983, the cut off date for responding to the Draft EIS. However, we are responding to the letter and will include it in the Final EIS.

Your letter correctly states that the Heeia Kea property is designated Residential on the Detailed Land use Map. However, we disagree with your statement that Heeia Kea is "at the outer edge of the urban fringe area bordering on rural Kahaluu". Page 19 of the recently adopted 1982 General Plan for the City and County of Honolulu clearly indicates that the Heeia Kea property is well within the urban fringe. Kahaluu Neighborhood Board No. 29 also recognizes that the Heeia Kea land is within the "urban fringe".

As you are perhaps aware, 102 acres of the Heeia Kea property is presently Residential, R-6. This zoning is based upon the Comprehensive Zoning Code (Ordinance No. 3234) effective January 22, 1969. We do not believe your reference to Rural Protective Zoning is appropriate as this zoning (which incidentally permitted 5,000 square foot lots) was deleted almost 14 years ago.

With respect to agricultural use of the property, an agricultural feasibility study completed by Frank S. Scott, Ph.D., Agricultural Economist indicated that the agricultural production on the lands was not an appropriate use. Further, in an EIS comment letter dated December 7, 1982, Jack K. Suwa, Chairman, Board of Agriculture, stated "we do not anticipate the proposed project to have significant impacts on agriculture ...".

Mr. Ralph Kawamoto, Planner
Department of General Planning
March 21, 1983
Page Two

For your reference, we are enclosing a letter dated March 4, 1983 from Joseph K. Conant, Director, Department of Housing and Community Development, stating that "the DHCD endorses the proposed project".

Thank you for your comments and participation in the EIS review process.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization
Hawaiian Electric Co., Inc.
Dr. Willard T. Chow
Andrew I.T. Chang

1032

XUCAI

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
550 SOUTH KING STREET
HONOLULU, HAWAII 96813

MAR 18 1983

Date Received _____

File: _____

To: DB

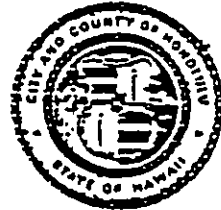
Action: _____

WILLARD T. CHOW
CHIEF PLANNING OFFICER

RALPH PORTMORE
DEPUTY CHIEF PLANNING OFFICER

DGP2/83-4919

EILEEN R. ANDERSON
MAYOR



March 9, 1983

MEMORANDUM

TO: Mr. Michael M. McElroy, Director
Department of Land Utilization

VIA: Mr. Andrew I. T. Chang, Managing Director 2/3/9

SUBJECT: Draft EIS for Heeia Kea Subdivision

Implementation of the Heeia Kea Subdivision would be inconsistent with the area's proposed long-range plans.

While the Kaneohe-Kualoa Detailed Land Use Map adopted July 29, 1964 designates the project site for residential use, the proposed Development Plan (DP) for Koolaupoko delineates the site principally for agricultural use, thereby creating an inconsistency in permitted uses between present thinking and the past. Although the DP for Koolaupoko is just a proposed plan at this time (with probable adoption in the near future), the objectives and policies embodied in the adopted General Plan must be considered when evaluating changes to proposed development patterns.

Policies in the General Plan specifically call for a reduction in developmental pressures in urban-fringe and rural areas and the prevention of an undesirable spreading of development. Heeia-Kea is at the outer edge of the urban-fringe area bordering on rural Kahaluu.

The present Kaneohe-Kualoa DLUM allows a much greater intensity of urbanization in the area than is called for under these adopted policies. The proposed DP for the area recognizes and implements these policies by specifying a land use pattern consisting of a farming environment in the community with opportunities for agricultural diversification and maintaining agricultural lands along the section of the windward coast.

Mr. Michael M. McElroy, Director
Page 2

The proposed DP is also consistent with earlier community concerns and City policies as reflected in the Rural Protective zoning of the area.

The EIS should include the above discussion.

Ralph Kawamoto

RALPH KAWAMOTO
Planner

APPROVED:

W. T. Chow

WILLARD T. CHOW

cc: Gray, Hong & Associates, Inc. ✓
Hawaiian Electric Company

XIII B1

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Joseph K. Conant, Director
Department of Housing & Community Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Subdivision


Dear Mr. Conant:

We have received a copy of your memorandum to Department of Land Utilization dated March 4, 1983 regarding the subject project. Your comments regarding zoning, DLUM designation, State Land Use Map designation and Development Plan designation are contained in the Draft and will be in the final Environmental Impact Statement (EIS). Your comment endorsing marketable and low and moderate cost housing and your request to reserve 10 percent of residential development for low- and moderate-income families will be incorporated into the Draft comment section of the Final EIS. Your endorsement of the project is appreciated.

We thank you for your participation in the EIS process. Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

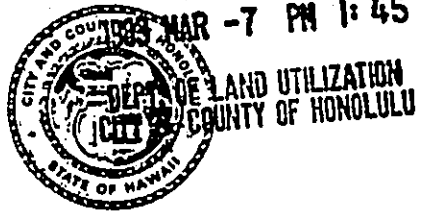
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LU 3/83 970

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4161

EILEEN R. ANDERSON
MAYOR



JOSEPH K. CONANT
DIRECTOR

CHARLES K. TORIGOE
DEPUTY DIRECTOR

March 4, 1983

MENORANDUM

TO: Michael M. McElroy, Director
Department of Land Utilization

FROM: Joseph K. Conant

SUBJECT: Draft Environmental Impact Statement for Heeia Kea
Subdivision
Koolaupoko, Oahu
TMK: 4-6-06: 1-3, 7-16; 22-51
4-6-12: 32
Area: 102± Acres
Proposal: 389 Single Family Units


We appreciate the opportunity to review and comment on the Draft EIS for Heeia Kea Residential Subdivision.

We note that the land proposed for development is zoned R-6 residential; designated residential on the Detailed Land Use Map and classified as Urban according to the State Land Use District Map. The proposed Koolaupoko Development Plan presently designates portions of the property as agriculture.

Additionally, the developer's objective for creating the proposed subdivision is to provide marketable residential housing including some low and moderate cost units to serve the needs of the Windward Oahu area. The DHCD endorses the proposed project.

We wish to request that at least 10 percent of all residential developments be set aside for the low- and moderate-income families.

We will retain the EIS report in our files.


JOSEPH K. CONANT

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Edwin B. Stevens, Chairman
Kahalu'u Neighborhood Board No. 29
c/o Kahaluu Community Center
47-232 Waihee Road
Kaneohe, Hawaii 96744

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Stevens:

We have received a copy of your letter to Department of Land Utilization dated February 10, 1983 regarding the subject property. As a result of your letter, Mr. David Bills of our staff and yourself met on March 4, 1983 to discuss your concerns and what areas should be specifically addressed in the Final Environmental Impact Statement (EIS) and this response letter. Based on this meeting, we are directing our response in one area: the development scale.

Development Scale

There are numerous factors which have determined the development scale as proposed for the project. These were all weighed cumulatively and the result was the project as proposed. The factors include necessary roadway improvements, drainage improvements, water improvements, sewer improvements, traffic congestion and other technical considerations. The factors also include the reaction by the general public, people in the specific area, the potential homeowners, Hawaiian Electric Company shareholders and all government agencies who will be involved in reviewing the project. Finally, economic feasibility plays a major role in the project development.

Based upon the agreement to purchase the property from Kamehameha Schools/Bishop Estate, the land acquisition cost is substantial. Reducing the land use density will escalate housing costs significantly. As you are aware, there are significant pressures to provide housing at a price which is affordable. This applies to all levels of housing and not solely low and moderate income housing even though these two classes receive most of the attention.

The result of all factors is that the proposed scale allows a reasonable ability to attain these goals without causing significant environmental problems. The development as proposed contains 389 lots. However, the maximum allowable density for the project is 736 lots if all lots were to be 5,000 square feet. Under a duplex configuration, the project areaw could support 980 lots. The

Mr. Edwin B. Stevens, Chairman
Kahalu'u Neighborhood Board No. 29
March 21, 1983
Page Two

foregoing numbers are based on 102 acres and allowing 12 acres for roads, 3.5 acres for a park and 2.0 acres for the Hawaiian Electric Company Base Yard. Therefore, we hope you recognize that the project is far below maximum density nor do we consider maximum density appropriate.

We thank you for your comments and the opportunity to discuss the project as part of the EIS review process.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A3

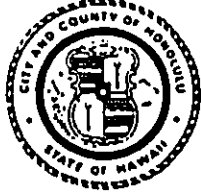
KAHALUU NEIGHBORHOOD BOARD NO. 29
c/o KAHALUU COMMUNITY CENTER
47 232 WAIHEE ROAD
KANE'OE, HAWAII 96744
HE'EIA KEA, KAHALU'U, WAIHE'E, WAI'AHOLE, WAIKANE, HAKIPUU AND KUALOAI

Date Received FEB 15 1983

Title: _____
DB

Action: _____

"Let us not ever have
an unhappy minority"



February 10, 1983

Michael M. McElroy, Director
Department of Land Utilization
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

Comments on Draft Environmental Impact Statement
Proposed Hawaiian Electric Company He'eia Kea Residential Subdivision
Tax Maps 4-6-06 & 4-6-32 Various Parcels (218.1 Acres)
He'eia, Ko'olaupoko, O'ahu, Hawai'i

Dear Mr. McElroy:

We have reviewed the above Draft Environmental Impact Statement and find that our comments on the Preparation Notice were neither fully comprehended nor completely addressed.

Therefore, we hereby resubmit our letter of 12-20-82, together with exhibits, and direct that it again be considered our response and that it be incorporated in the Final Environmental Impact Statement.

Sincerely,

A handwritten signature in cursive script that reads "Edwin B. Stevens".

Edwin B. Stevens, Chairman
Kahalu'u Neighborhood Board No. 29

Reference: NB#29 letter of 12-20-82 to Gray, Hong re: HECO/He'eia Kea Project

Copies: Gray, Hong & Associates, Inc.
Hawaiian Electric Company
Kane'ohe N.B.#30
Kahalu'u N.B.#29 - Chairman
Kahalu'u Community Resource Center
Neighborhood Commission.

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

March 21, 1983

Ms. Jacqueline Parnell, Director
State of Hawaii
Office of Environmental Quality Control
850 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

**SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement**

Dear Ms. Parnell:

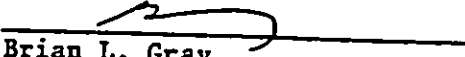
We have received a copy of your letter to Department of Land Utilization dated March 8, 1983 regarding the subject project. We would like to clarify certain points expressed in your response comments. These are:

1. The Draft Environmental Impact Statement (EIS) states the peak hourly traffic generated by the project will add approximately 300 vehicles to the existing peak hourly traffic on Kamehameha Highway. Based on Figures 15 and 16, the increase on the Kaneohe side of the project (Heeia viaduct) will be from 650 peak hourly vehicles to 873 peak hourly vehicles, and the increase on the Kahuku side of the project will be from 650 vehicles to 733 vehicles. Therefore, the increase at Heeia viaduct will be 34 percent.
2. The Draft EIS states as a worst case that the peak hourly traffic period in the vicinity of Kahakili/Likelike Highway intersection will extend to accommodate more traffic volume. The Draft EIS also states that if 50% of the ultimate Heeia Kea Subdivision passes through this intersection, the peak hourly volume on the Kahakili Leg would increase 3 percent (The Final EIS will be revised to indicate a 5.5 percent increase). The current peak hourly traffic period in the A.M. period is 2.5 hours and in the P.M. period is 1.5 hours. Based on the fact that other projects such as H-3 will have more of an impact on Kahakili/Likelike Highway peak hourly periods, we do not believe an appropriate analysis could be prepared to accurately or meaningfully predict the extension of the peak hour resulting from the project.

We thank you for your comments.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
Dept. of Land Utilization
1032

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

MAR 9 1983
Date Received _____
File _____
DB
Jacqueline Parnell
DIRECTOR
TELEPHONE NO.
548-6915

March 8, 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: Draft EIS for Heeia Kea Subdivision

According to the draft EIS, the average daily traffic and the peak hourly traffic volumes at the Heeia viaduct will increase approximately 50% as a result of this project. The Likelike Highway is already near peak capacity and as stated in the EIS, the peak traffic period will extend to accommodate the increase in volume. We would like to see addressed in the final EIS the additional time it will take to drive to town from Kaneohe and how much longer the peak traffic period will be extended because of this project.

Sincerely,

Jacqueline Parnell
Director

cc: HECO
Gray, Hong and Associates Inc.

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

March 21, 1983

Mr. Edwin T. Murabayashi
EIS Coordinator
University of Hawaii at Manoa
Water Resources Research Center
Holmes Hall 283
2540 Dole Street
Honolulu, Hawaii 96822

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement


Dear Mr. Murabayashi:

We thank you for the letter dated March 2, 1983 regarding the subject Draft Environmental Impact Statement (EIS). The Final EIS will be revised to include a small inset map on Figure 1 to show the project site relative to the island.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII AS



MAR 7 1983

University of Hawaii at Manoa *DB*

Water Resources Research Center
Holmes Hall 203 • 2540 Dole Street
Honolulu, Hawaii 96822

2 March 1983

Department of Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Subject: Draft Environmental Impact Statement for Heeia Kea
Subdivision, Heeia, Koolaupoko, Oahu, February 1983

We have reviewed the subject DEIS and offer the following comment. It would be desirable to have a small inset map on Fig. 1 showing the project location relative to the whole island.

Thank you for the opportunity to comment. This material was reviewed by WRRC personnel.

Sincerely,

Edwin T. Murabayashi

Edwin T. Murabayashi
EIS Coordinator

ETM:jm

cc: Gray, Hong, and Associates
Hawaiian Electric Co.

XIII BS

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

March 21, 1983

Dr. Michael J. Chun
Director & Chief Engineer
Department of Public Works
City and County of Honolulu
650 S. King Street, 11th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Dr. Chun:

We have received your comments regarding the subject Draft Environmental Impact Statement (EIS). We are providing the following responses to your comments.

1. As presented in the Draft EIS, it is believed that the most critical period when the sensitive nature of Kaneohe Bay can be affected is during construction. Effective erosion control procedures are proposed during the construction period. However, after each incremental phase is completed and vegetation is reestablished, significant disruption from runoff or siltation is not anticipated. The EIS contained quantitative information estimating the increase in runoff as well as characteristics of the runoff.

The need for permanent erosion control measures such as detention and sediment ponds will be considered in the development of the detailed erosion control plan for the project.

2. Your requirement which states that existing inadequate Public Works structures must be upgraded will be added to the Final EIS.
3. The fact that Kamehameha Highway is owned by the State, but maintained by the City and County has been presented in the Draft EIS (see Page 12) and will be in the Final EIS.
4. With respect to municipal sewer service, your requirement to provide two permanent pump stations will be incorporated into the Final EIS.

XIII AG

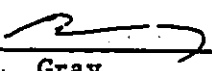
Dr. Michael J. Chun
Director & Chief Engineer
Department of Public Works
March 21, 1983
Page Two

5. With respect to sewage treatment, your statements regarding the current one plant/two plant study and your estimate that one of these alternatives will be complete within Fiscal Year 1986-1987 will be incorporated into the Final EIS.

We thank you for your comments. Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

Date: _____
File: _____
To: _____
Action: _____

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU HAWAII 96813

EILEEN R. ANDERSON
MAYOR



MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

ENV 83-50

February 23, 1983

MEMORANDUM

TO: MR. MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER

SUBJECT: DRAFT EIS FOR HEEIA KEA SUBDIVISION
KANEOHE, KOOLAUPOKO, HAWAII

We have reviewed the subject EIS and have the following comments.

1. Since Kaneohe Bay is a sensitive water area, the developer should consider and incorporate permanent detention and sediment ponds to control runoff and silt discharge into the bay.
2. Any existing structures serving the proposed development should be upgraded should they be found to be substandard.
3. That portion of Kamehameha Highway fronting the proposed development is under the jurisdiction by the State but is maintained by the City and County.
4. a. In order to provide municipal sewer service from the existing Kaneohe sewerage system, two (2) permanent sewage pump stations will have to be constructed. One station will be built within the proposed development (identified as SPS #1 in Figure VI-8) and the other near the existing privately-owned Alii Bluffs pump station. The City and County has no plans to construct these stations in the current six-year Capital Improvement Program.
- b. Sewage entering into the sewerage system may be treated at the existing Kaneohe sewage treatment plant. The plant is presently nearing its installed capacity and will not be able to accommodate the proposed flows from the development. A facility plan study now underway on the Kaneohe-Kailua treatment and disposal system will determine whether a one-plant alternative should be adopted in lieu of the present two-plant system. The study is expected to be completed in mid-1983.

Mr. Michael M. McElroy

- 2 -

February 23, 1983

- c. If the one-plant system is adopted, all sewage in the district will be treated in Kailua in expanded facilities. If the two-plant system is retained, the capacity of the Kaneohe plant will be expanded. Construction at either the Kaneohe and/or Kailua plants is tentatively scheduled to begin in Fiscal 1984-85. This type of construction can take up to about two (2) years to complete.
5. The average cost of municipal collection service is approximately \$165 per household per year. This amount does not include the cost of landfill operation.



MICHAEL J. CHUN
Director and Chief Engineer

cc: HECO
7 Gray, Hong & Associates, Inc.
Engineering
Wastewater Management

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

March 21, 1983

Mr. Roy H. Tanji
Director & Building Superintendent
Building Department
City and County of Honolulu
650 S. King Street, 2nd Floor
Honolulu, Hawaii 96813

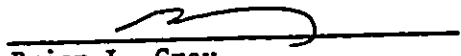
SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Tanji:

We have received a copy of your memorandum dated February 25, 1983 to Mr. Michael M. McElroy regarding the subject project. We thank you for your participation in the Environmental Impact Statement review process.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A7

Date Received **MAR 1 1983**

File: _____

To: **DB**

Action: _____

PB 83-156

February 25, 1983

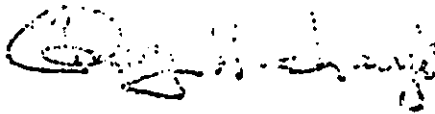
**TO: MR. MICHAEL McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION**

**FROM: ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT**

SUBJECT: DRAFT EIS FOR HEEIA KEA SUBDIVISION

We have reviewed the Draft EIS for the proposed Heeia Kea Subdivision and have no comments.

Thank you for the opportunity to review the Draft EIS.



**ROY H. TANJI
Director and Building Superintendent**

TH:lo
cc: Gray, Hong & Assoc., Inc.
Hawaiian Electric Co.
J. Harada

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

March 15, 1983

Capt. Jerry M. Matsuda, HANG
Contract & Engineer Officer
State of Hawaii
Department of Defense
Office of the Adjutant General
3949 Diamond Head Road
Honolulu, Hawaii 96816

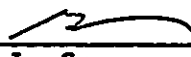
**SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement**

Dear Sir:

We have received a copy of your letter dated March 1, 1983 to the Department of Land Utilization. We thank you for your participation in the Environmental Impact Statement review process.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A8

1983
Date Received
File
Total *DR*
Action
31 MAR 1983

State of Hawaii
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 Diamond Head Road
Honolulu, Hawaii 96816

HIENG

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Heeia Kea Subdivision

Thank you for providing us the opportunity to review the proposed project,
"Heeia Kea Subdivision" Draft Environmental Impact Statement.

We have completed our review and have no comments to offer at this time.

Yours truly,

JERRY M. MATSUDA
Captain, HANG
Contr & Engr Officer

cc: Gray, Hong & Assoc., Inc.
Hawaiian Electric Company
Env. Quality Commission w/Draft EIS

XIII 88

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

March 21, 1983

Col. Alfred J. Thiede
District Engineer
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858

SUBJECT: Heei Kea Subdivision
Draft Environmental Impact Statement


Dear Sir:

We have received a copy of your letter to Department of Land Utilization dated March 4, 1983. Your comment regarding the potential need for DA permits for box culvert improvements was a part of the Draft EIS and will be part of the Final EIS.

We thank you for your participation in the EIS process. Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A9

LU 3/83-1009



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858

March 4, 1983

1983 MAR -9 PM 2:06

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

We have reviewed the Draft Environmental Impact Statement for the proposed Heeia Kea Subdivision, Heeia, Koolaupoko, Oahu, which was transmitted to us by the Environmental Quality Commission on February 7, 1983.

Based on our review, we have determined that structures for drainage improvements along Kamehameha Highway may require Department of the Army (DA) permits. Information regarding DA permit requirements and application procedures may be obtained from my Operations Branch staff at 438-9258.

Sincerely,

A handwritten signature in cursive script, appearing to read "Alfred J. Thiede".

Alfred J. Thiede
Colonel, Corps of Engineers
District Engineer

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

March 15, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

Mr. James W. Morrow, Director
Environmental Health
American Lung Association of Hawaii
245 North Kukui Street
Honolulu, Hawaii 96817

**SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement**

Dear Mr. Morrow:

We have received a copy of your letter to Department of Land Utilization dated March 8, 1983 regarding the subject project. Based on our discussion with Mr. Barry Root, the Environmental Impact Statement air quality consultant, we are providing the following response to your comments.


The air quality analysis was based on a worst case evaluation. It has been identified that carbon monoxide is the most critical pollutant with respect to present standards; i.e., compliance with carbon monoxide standards should assume that particulate standards will also be met. Light duty diesel vehicles (LDDV) produce fewer carbon monoxide emissions than standard gasoline driven vehicles. Therefore, maximizing LDDV vehicles in the carbon monoxide evaluation will minimize the projected carbon monoxide emissions. If a figure of 25 percent LDDV was used in the air quality analysis, the anticipated carbon monoxide emissions would be lower.

It may also be worth mentioning that the 25 percent LDDV projection by 1985 was made for the entire nation when there was a far greater concern as to the availability of gasoline. Diesel engines are more attractive on the mainland for "long haul" traffic as compared to Hawaii's short trip characteristics.

We thank you for your comments and they will be incorporated in the Final EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A10

MAR 14 1983

DB

March 8, 1983

Department of Land Utilization
850 South King Street
Honolulu, Hawaii 96813

Dear Sir:

Subject: Keala Kaa Subdivision

We have reviewed the draft Environmental Impact Statement (EIS) for the subject project with particular attention to those sections pertaining to air quality impact.

We found that the air quality impact analysis failed to adequately address the projected increase in light duty diesel vehicles (LDDV) over the study period. The fraction of LDDV in the national vehicle fleet has been projected by industry to reach as high as 25% by 1985. On what basis was the range of 1.0 - 1.12 ISW selected for use in the EIS? The additional particulate emissions associated with diesel engines and their attendant potential health effects should have been addressed.

Sincerely yours,

James W. Morrow
Director
Environmental Health

JWM:jm
C3/L8338

cc: Gray, Hong & Associates
Hawaiian Electric Company

XIII B10

RECEIVED AS FOLLOWS

MAR 14 1983

DB

March 8, 1983

Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

Dear Sir:

Subject: Kealia Kaa Subdivision

We have reviewed the draft Environmental Impact Statement (EIS) for the subject project with particular attention to those sections pertaining to air quality impact.

We found that the air quality impact analysis failed to adequately address the projected increase in light duty diesel vehicles (LDDV) over the study period. The fraction of LDDV in the national vehicle fleet has been projected by industry to reach as high as 25% by 1985. On what basis was the range of 1.0 - 1.1? LDDV selected for use in the EIS? The additional particulate emissions associated with diesel engines and their attendant potential health effects should have been addressed.

Sincerely yours,

James W. Morrow
Director
Environmental Health

JWM:jm
C3/L8338

cc: Gray, Hong & Associates
Hawaiian Electric Company

XIII B10

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

March 21, 1983

Dr. Takeshi Yoshihara
Energy Program Administrator
State of Hawaii
Department of Planning & Economic Development
Kamamalu Building
250 South King Street
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

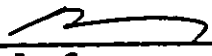
Dear Dr. Yoshihara:

Your correspondence dated February 10, 1983 will be incorporated into the Final Environmental Impact Statement in accordance with Chapter 343 Environmental Impact Statement Rules and Regulations.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII All

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
ENVIRONMENTAL QUALITY COMMISSION
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

Date Received FEB 16 1983 ROY R. TAKEMOTO
CHAIRMAN
File: _____
To: DB
Action: _____
TELEPHONE NO.
(808) 548-6915

February 7, 1983

Dear Reviewer:

Attached for your review is an Environmental Impact Statement (EIS) that was prepared pursuant to Chapter 343, Hawaii Revised Statutes and the Rules and Regulations of the Environmental Quality Commission:

Title: Draft EIS for Heeia Kea Subdivision
Location: Heeia, Koolaupoko, Hawaii
Classification: Applicant Action

Your comments or acknowledgement of no comments on the EIS are welcomed. Please submit your reply to the accepting authority or approving agency:

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th floor
Honolulu, Hawaii 96813

Please send a copy of your reply to the proposing party:

Gray, Hong & Associates, Inc. and Hawaiian Electric Company
116 South King Street, Room 508 P.O. Box 2750
Honolulu, Hawaii 96813 Honolulu, Hawaii 96840

Your comments must be received or postmarked by: March 10, 1983.

If you have no further use for this EIS, please return it to the Commission.

Thank you for your participation in the EIS process.

Feb. 10, 1983
No comments
Takashi Yoshida
Energy Program Administrator

XIII B11

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

March 21, 1983

Mrs. Emiko I. Kudo, Director
Department of Parks & Recreation
City and County of Honolulu
650 S. King Street, 9th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

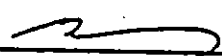
Dear Mrs. Kudo:

Your letter of February 14, 1983 regarding the subject Draft Environmental Impact Statement (EIS) will be incorporated into the Final (EIS) in accordance with Chapter 343 EIS Rules and Regulations.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

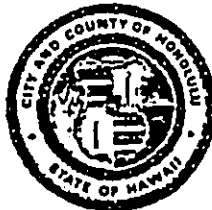
XIII A12

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

Date Received **FEB 16 1983**

EILEEN R. ANDERSON
MAYOR



File: _____
To: _____ **D17** _____
Action: _____

EMIKO I. KUDO
DIRECTOR

SAM L. CARL
DEPUTY DIRECTOR

OSCAR K. ASAHINA
EXECUTIVE ASSISTANT

February 14, 1983

TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: EMIKO I. KUDO

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
HEEIA KEA SUBDIVISION
TMK: 4-6-06: 1 et al. & 4-67-16: 32

We have no additional comments to offer to the Draft EIS of the Heeia Kea Subdivision at this time. Our comments and recommendation to the EIS Preparation Notice has been acknowledged and inserted into the Draft EIS by the applicant, Section XI A-28 and XI B-28.

Should you have any questions, please contact Mr. Jason Yuen of our Advance Planning Section at extension 4695.

A handwritten signature in cursive script that reads "Emiko I. Kudo".

(Mrs.) EMIKO I. KUDO, Director

EIK:vc

cc: Gray, Hong & Associates ✓
HECO

~~XIII~~ B12

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

March 21, 1983

Mr. Michael M. McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 S. King Street, 7th Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

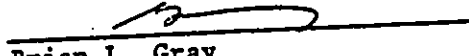
Dear Mr. McElroy:

We have received your comments dated March 10, 1983 regarding the subject project. We will revise the Final Environmental Impact Statement (EIS) to include a brief discussion in the alternatives section that cluster housing may be suitable for portions of the property. We will also make the statement that planned development-housing is not considered reasonable as an alternative since the area is predominantly single-family residential.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.

1032

XIII A13

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

MAR 14 1983

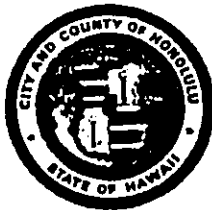
Date Received _____

File: _____

To: DB

Action: _____

EILEEN R. ANDERSON
MAYOR



MICHAEL M. McELROY
DIRECTOR

ROBERT B. JONES
DEPUTY DIRECTOR
(JDN)

March 10, 1983

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
119 Merchant Street Suite 607
Honolulu, Hawaii 96813

Dear Mr. Gray:

Draft Environmental Impact Statement (EIS)
Heeia Kea Subdivision, --Heeia, Koolaupoko, Oahu
Tax Map Keys: 4-6-06: 1-3, 7-16, 22-51 and 4-6-16: 32

We have reviewed the subject Draft EIS and have the following comments:

Reference: Section VI. ALTERNATIVES TO THE PROPOSED ACTION,
Pages 81-84.

Comment: Alternative residential development options should be considered. The Draft EIS discusses reduced density development but does not consider other alternatives such as cluster housing or planned development-housing.

If there are any questions, please contact John Nakagawa of our staff at 523-4077.

Very truly yours,

Michael M. McElroy
MICHAEL M. McELROY
Director of Land Utilization

MMM:s1

cc: HECO

XIII B13

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

March 21, 1983

Mr. Hideo Murakami, State Comptroller
State of Hawaii
Department of Accounting & General Services
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Murakami:

Your letter of February 14, 1983 regarding the subject Draft Environmental Impact Statement (EIS) will be incorporated into the Final EIS in accordance with Chapter 343 EIS Rules and Regulations.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A 14

Date Received FEB 15 1933

File: _____
For: DB
Action: _____

(P)1142.3

FEB 14 1933

Mr. Michael M. McElroy
Director
Department of Land Utilization
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. McElroy:

Subject: Draft EIS for Heeia Kea Subdivision

We have reviewed the subject draft EIS and have no
comments to offer.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

NS:jnt 4-6
cc: ✓ Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Hawaiian Electric Company
P. O. Box 2750
Honolulu, Hawaii 96840

XIII B14

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

March 21, 1983

Ms. Donnis H. Thompson
Superintendent of Education
State of Hawaii
Department of Education
Queen Lilioukalani Building
P. O. Box 2360
Honolulu, Hawaii 96804

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

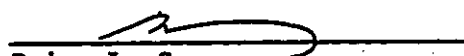
Dear Ms. Thompson:

Your letter of February 14, 1983 regarding the subject Draft Environmental Impact Statement (EIS) will be incorporated into the Final EIS in accordance with Chapter 343 EIS Rules and Regulations.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A 15

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2380
HONOLULU, HAWAII 96804

DR. DONNIS H. THOMPSON
SUPERINTENDENT

FEB 17 1983

Date Received _____

File: _____

To: DB

Action: _____

OFFICE OF THE SUPERINTENDENT

February 14, 1983

Department of Land Utilization
City and County of Honolulu
650 S. King Street
Honolulu, HI 96813

Dear Sir:

SUBJECT: Draft EIS for Heeia Kea Subdivision

We have reviewed the Draft EIS for the subject project and do not have any further comments to offer at this time.

Sincerely,

Lloyd K. Mizuta

for Donn H. Thompson
Superintendent of Education

DHT:HL:j1

cc: Mr. James Edington
Windward District
✓ Gray, Hong & Associates, Inc.
Hawaiian Electric Company

XIII B15

AN EQUAL OPPORTUNITY EMPLOYER

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

March 21, 1983

Mr. Kazu Hayashida
Manager & Chief Engineer
Board of Water Supply
City and County of Honolulu
630 S. Beretania Street
Honolulu, Hawaii 96843

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Hayashida:

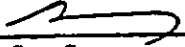
We have received a copy of your memorandum to Department of Land Utilization dated February 23, 1983 regarding the subject project. We have also contacted Mr. Al Koga of your staff for clarification of a few comments. The following responses are being provided to address your comments.

1. The Final Environmental Impact Statement (EIS) will be revised to state that the 30-inch transmission main is not an inherent part of the Kaneohe distribution system and this main also acts as a transmission system to Kaneohe, Kailua, Waimanalo and Hawaii Kai.
2. The Final EIS will be revised to state that the Board of Water Supply requires a 0.3 million gallon reservoir for the project. The reservoir can be provided within the project or be a proportionate part of another reservoir constructed elsewhere. In addition, water development changes for a storage will not be applicable to the project.
3. We understand that prior to submittal of the water master plan, the Board of Water Supply cannot make a determination as to adequacy of the system. The EIS states that the water master plan will be prepared and submitted to the Board prior to subdivision approval.
4. The complete water system that is necessary for the project, including off-site facilities such as transmission mains, will be determined by submittal and your approval of the water master plan.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
Dept. of Land Utilization
1032

XIII A16

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA

HONOLULU, HAWAII 96843



Received
EILEEN R. ANDERSON, Mayor
DB
YOSHIE H. FUJINAKA, Chairman
ROBERT A. SOUZA, Vice-Chairman
MILTON J. AGADER
MICHAEL J. CHUN
WALTER A. DODS, JR.
RYOKICHI HIGASHIONNA
DONNA M. HOWARD

February 23, 1983

KAZU HAYASHIDA
Manager and Chief Engineer

TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: KAZU HAYASHIDA
BOARD OF WATER SUPPLY

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR HEEIA-KEA SUBDIVISION, HEEIA,
KOOLAUPOKO, OAHU

Thank you for allowing us the opportunity to review the environmental document for the proposed subdivision.

In addition to our previous comments appended on page XI-A27, we offer the following:

1. Pages 17 and 18: Although the 30-inch main feeds the Kaneohe 272-ft. system, it is not an inherent part of Kaneohe distribution system. The main is basically a transmission system, transporting water to Kaneohe, Kailua, Waimanalo, and Hawaii Kai.
2. Page 18: Since the developer will be required to construct a 0.3 million gallon reservoir to serve the development, the water development charge for a reservoir facility does not apply in this case.
3. Page 18: The adequacy of our water system to meet the projected demands from the proposed development cannot be determined until the water master plan is submitted to us.



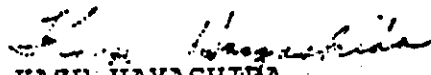
Mr. Michael M. McElroy
Page 2

February 23, 1983

4. Other off-site facilities, such as transmission mains, may be required and will be determined when the water master plan is submitted to us.

If you have any questions, please contact Lawrence Whang at 548-5221.

Very truly yours,


KAZUO HAYASHIDA
Manager and Chief Engineer

cc: Gray, Hong & Associates, Inc.
Hawaiian Electric Company

XIII B:6

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

The Honorable Jack K. Suwa, Chairman
State of Hawaii
Board of Agriculture
Department of Agriculture
1428 South King Street
P. O. Box 22159
Honolulu, Hawaii 96822

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement


Dear Mr. Suwa:

We have received a copy of your memorandum to the Department of Land Utilization dated March 1, 1983. We thank you for your comment that the Draft Environmental Impact Statement (EIS) addresses your concerns. We have asked our agricultural economist, Dr. Frank Scott, to respond to your comment regarding the statement that "the amount of prime agricultural land on Oahu far exceeds the amount which would be needed for intensive crop production in the foreseeable future". Dr. Scott's response is attached.

Should you have any questions, please contact our office.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

Enclosure

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A17

MEMORANDUM

To: David Bills
Gray, Hong & Associates, Inc.

From: Frank S. Scott, Jr.
Agricultural Economist

Date: March 14, 1983

Subject: DOA Review of Draft EIS - Heeia Kea Subdivision

I appreciate the opportunity to define the statement on Page 63 of the EIS report which reads "The amount of prime agricultural land on Oahu far exceeds the amount that would be needed for intensive crop production in the foreseeable future." In order to clarify the basis for this statement, the following factors must be taken into consideration.

1. The statement refers to the quantity of prime agricultural land as determined by the State of Hawaii ALISH land classification. It is not intended to imply that these lands could be made available for agricultural use at low cost. In fact, all prime land on Oahu has priced itself out of use value for agriculture, except for the most intensive crops.

Prime agricultural land on Oahu is valued at its highest and best use, regardless of restrictive down zoning for agriculture. Because of the high market prices which have been paid for substantial acreages of prime agricultural land and because of the high cost of required infrastructure, subdividers of prime agricultural land are forced to limit the size of agricultural lots to parcels that are marketable at a price which reflects cost. The Department of Land Utilization of the City & County of Honolulu is reluctant to approve these subdivisions because of its concern that the small parcels will become "gentlemen's estates". Thus, although the prime land is zoned for agriculture, it is not likely to be used for agriculture because of high costs and because of the restrictions imposed on agricultural subdivisions.

2. The statement further reflects the extremely limited opportunity for further agricultural production on Oahu.

A test of the economic viability for potential production on Oahu must provide positive answers to the criteria of ecological adaption, sales potential, intensity of production and comparative advantage. Extensive type crops, such as corn and alfalfa, provide very small per acre net returns to risk. Large land areas which permit optimal mechanization and economy of scale, plus very low annual land costs are imperative for economically viable production of these crops. The limited availability and high cost of irrigation water is another crucial consideration on Oahu. In addition, these crops are plagued with disease, insect and climatic problems which contribute further to negative economic viability of potential crop production.

David Bills
March 14, 1983
Memo - Page 2

Thus, the statement appropriately refers only to the amount, not availability, of prime agricultural land on Oahu adaptable to intensive crop production. The only intensive crops which clearly show promise for expanded production on Oahu in light of current knowledge are bananas, flowers and foliage, truck crops and macadamias.

Displacement of banana imports for Hawaii consumption would require 225 acres at a yield of 35,000 pounds per acre. However, most of any expanded production to displace imports would be expected to take place in Puna because of lower land costs and no irrigation costs.

Displacement of vegetable imports for those vegetables which can be successfully grown on Oahu under existing technology would require less than 900 acres of additional land. Because of comparative advantages in producing some of the major vegetable crops on the outside islands, it is not likely that Oahu's share would exceed 500 acres.

A total of 400 acres was devoted to flower and foliage production on Oahu in 1981. During recent years, this acreage has expanded at about 10 percent per year. Because of increasing foreign competition and comparative advantages of production of many floral and foliage crops on the outside islands, I would expect this expansion to decline to a lower rate of perhaps 5 percent annually. Thus, it might be optimistic to assume an expansion of more than 150 acres in flower and foliage production on Oahu during the next 5 years. But most flower and foliage production, except for stock plants, requires only space for shade houses, not prime land.

Whereas macadamias are ecologically adapted to many areas on Oahu, most expansion in macadamia production would be expected to take place on the outside islands because of lower land costs and lower costs or no need for irrigation water.

In summary, an optimistic estimate of prime land requirements on Oahu for expansion of intensive, diversified crop production during the next few years would not be expected to exceed 1,000 acres.

I consider my statement to be based on "factual analysis" in light of available information and I am not concerned that it "would not stand up to serious investigation". Furthermore, economics points to the phasing out of at least some sugar and pineapple production on Oahu. In fact, this is currently taking place for pineapple and has occurred in recent years for sugar. This expected phasing out of even a small amount of sugar and pineapple would make land available far in excess of an indicated potential need for intensive, diversified crop production.

Whereas I think I have correctly assessed the situation in view of existing technology and the existing market, there may be social, but not necessarily economic justification, for keeping prime agricultural lands as open space in the event of eventual need.

XIII A 17

GEORGE R. ARIYOSHI
GOVERNOR



State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
P. O. Box 22159
Honolulu, Hawaii 96822

JACK K. SUWA
CHAIRMAN, BOARD OF AGRICULTURE

MAR 8 1983

DB

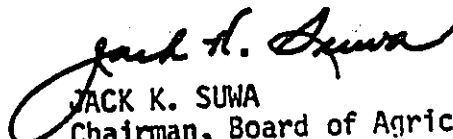
MEMORANDUM

To: Mr. Michael M. McElroy, Director
Department of Land Utilization
City and County of Honolulu

Subject: Draft Environmental Impact Statement (EIS)
Heeia Kea Subdivision
T.M.: 4-C-15: 1, 2, 4, 7-16, 22-51
4-C-16: 32
Heeia, Koolauoko, Oahu

The Department of Agriculture has reviewed the subject Draft EIS and finds that our concerns have been adequately addressed. We do, however, question the statement on page 53, which also appears on page 6 of Appendix D, namely "the amount of prime agricultural land on Oahu far exceeds the amount which would be needed for intensive crop production in the foreseeable future." (emphasis added) This statement is not based on any factual analysis in the EIS or its Agricultural Feasibility Study, and we suspect would not stand up to serious investigation.

Thank you for the opportunity to comment.


JACK K. SUWA
Chairman, Board of Agriculture

cc: ✓ Gray, Hong and Associates, Inc.
Hawaiian Electric Company

XIII B17

GEORGE R. ARIYOSHI
GOVERNOR



JACK K. SUWA
CHAIRMAN, BOARD OF AGRICULTURE

MAR 8 1983

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
P. O. Box 22159
Honolulu, Hawaii 96822
March 7, 1983

DB

MEMORANDUM

To: Mr. Michael M. McElroy, Director
Department of Land Utilization
City and County of Honolulu

Subject: Draft Environmental Impact Statement (EIS)
Heeia Kea Subdivision
T.M.: 4-C-15: 1, 2, 4, 7-16, 22-51
4-C-16: 32
Heeia, Koolauapoko, Oahu

The Department of Agriculture has reviewed the subject Draft EIS and finds that our concerns have been adequately addressed. We do, however, question the statement on page 53, which also appears on page 6 of Appendix D, namely "the amount of prime agricultural land on Oahu far exceeds the amount which would be needed for intensive crop production in the foreseeable future." (emphasis added) This statement is not based on any factual analysis in the EIS or its Agricultural Feasibility Study, and we suspect would not stand up to serious investigation.

Thank you for the opportunity to comment.

Jack K. Suwa
JACK K. SUWA
Chairman, Board of Agriculture

cc: ✓ Gray, Hong and Associates, Inc.
Hawaiian Electric Company

XIII B17

RECEIVED AS FOLLOWS

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Mr. Gordon Lum
Planning Coordinator
Oahu Metropolitan Planning Organization
1164 Bishop Street, Ste. 1509
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Lum:

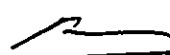
We have received a copy of your letter to Department of Land Utilization dated February 23, 1983 regarding the subject property. We are providing the following responses to your comments:

1. The Final Environmental Impact Statement (EIS) will be revised to specifically state that the proposed Kamehameha Highway improvements will be constructed by and at the developer's expense.
2. On page 27, Subsection D the Draft EIS specifically states that left turn storage lanes and acceleration-deceleration lanes at Kamehameha Highway will be constructed at the developer's cost. This statement will be revised to also identify that this work will be done by the developer.
3. The Final EIS will be revised to include a theoretical capacity based on the Highway Capacity Manual. Preliminary indications are that this theoretical number will be approximately 1000 vph. However, this figure has to be verified. The preliminary capacity value is at the high end of the range cited in the Draft EIS and this value is used as a guide. We believe the presentation in the Draft EIS is more appropriate for the project area even though the Highway Capacity Manual analysis supports the EIS analysis.

We thank you for your comments. Your comments and our response will be a part of the Final EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
Dept. of Land Utilization
1032

VII A 18

OMPO

FEB 23 1983
To: _____
From: _____
Subject: _____

Oahu
Metropolitan
Planning
Organization

Suite 1509
1164 Bishop Street
Honolulu, Hawaii 96813
(808) 523-4178
(808) 548-2638

February 23, 1983

Department of Land Utilization
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Subject: Review of Draft EIS for Heia Kea Subdivision

Dear Sir:

OMPO has reviewed the traffic analysis of the above mentioned draft EIS and offer the following comments:

1. The statement on page 67 which reads: "The increase in traffic will require the installation of channelized intersections at the two 56-foot wide right-of-way intersections with Kamehameha Highway." should specify who is responsible for the installation of the channelized intersections.
2. Figures 15 and 16 should indicate whether the deceleration and vehicle storage lanes on Kam Highway are existing or proposed. If these lanes are proposed, the EIS should state who will construct the lanes.
3. The last paragraph on page 70 states that:
 - a) the capacity of a two-lane rural highway is 600 to 1,000 vph per lane depending on local conditions,
 - b) peak hour traffic in the Kaneohe bound lane of Kam Highway will increase from 520 vph to 712 vph, and
 - c) the level of service on the Kaneohe bound lane of Kam Highway will still be tolerable and well within the capacity of Kam Highway.

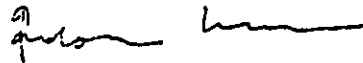
The EIS should determine the appropriate capacity of Kam Highway within the vicinity of the proposed development. The location of this capacity analysis should be at the "bottleneck" within the vicinity of the proposed development since this point will control the maximum flow through the highway segment. The capacity range of 600 to 1,000 vph is too large and can be determined theoretically using the Highway Capacity Manual.

Department of Land Utilization
February 23, 1983
Page 2

Assuming the worst case situation, that the capacity of Kam Highway within the vicinity of the proposed development is 600 vph, the future peak hour traffic, due to the proposed development, will be 19 $\frac{1}{2}$ beyond the capacity of the roadway. This will result in forced-flow conditions which is not tolerable. Because of this conclusion, a more specific capacity should be determined.

If you have any questions regarding these comments, please call me.

Sincerely,



Gordon Lum
Planning Coordinator

GL/lb
cc: Gray, Hong & Associates, Inc.
Hawaiian Electric Company

~~XIV~~ R18

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

Mr. Charles F. Reppun, President
Hui Malama Aina 'o Koolau
c/o 47-410 Lulani Street
Kaneohe, Hawaii 96744

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Reppun:

We have received your letter dated March 9, 1983 regarding the subject project, and have the following comments.

Cumulative Impact

The Environmental Impact Statement (EIS) addresses the specific project with respect to several master plans including the City and County General Plan, the Board of Water Supply master plan, the Department of Public Works Facility Plan and State plans for highway improvements. All such plans form the basis in which growth will or can be accommodated. The basis for these types of master plans have long been established even though they are periodically subject to change. The EIS for any one particular project cannot evaluate the merit of each master planning vehicle. This EIS attempts to accurately describe the relationship of the project to the existing master planning policies. It is our opinion that the project does not require special reevaluation of any of the State or City and County master planning documents. Moreover, inherent in the master planning process is consideration of the cumulative impact of all plan elements.

Water Master Plan and Erosion Control Plan

Both the water master plan and erosion control plan are detailed plans demonstrating how water will be provided to the project and how sedimentation will be controlled, respectively. The principles of both plans have been established in the EIS. It is not the purpose of this EIS to provide all the detailed information about all of the design specifics of this project. It is the purpose of this EIS to accurately and adequately describe what the project will involve. Both plans you refer to must be reviewed and approved by the appropriate government agencies in order to implement the project.

XIII A19

Mr. Charles F. Reppun, President
Hui Malama Aina 'O Koolau
March 21, 1983
Page Two

Traffic

The EIS describes existing and ultimate traffic conditions. Any assumptions have been based on engineering principles. We believe both the assumptions and conclusions reached accurately describe the impact of the project on traffic.

Heeia Small Boat Harbor

The EIS contains the statement that the proposed residential use will not significantly affect the small boat harbor. There will, of course, be additional traffic on the road and some residents will visit the pier. However, there is no relationship between the residential subdivision and the small boat harbor. Therefore, the statement has been made as one which can generally be perceived as accurate.

Sewage Disposal

The timing of City and County plans for sewerage the area are contingent upon this project to a certain degree. If the project is implemented, the City's facility plan will be implemented sooner. If the project is not implemented, there are other areas which will probably receive a higher priority with respect to installing sewers. Regardless of the time schedule, the City sewer system must be able to accommodate the sewage flow. The city will ultimately approve all connections, pump stations and sewer lines. The project, however, will pay a substantial share of this cost.

Agricultural and Agricultural Feasibility

The Draft EIS made every attempt to state the facts with respect to agricultural and agricultural feasibility. During the consultation process, the Department of Agriculture commented that they did not believe the project would significantly affect agriculture and this position has been supported in the Agricultural Feasibility study for the project. While we recognize that some areas within Windward Oahu have been more successful in providing income through farming, this particular site does not have that potential.

Mr. Charles F. Reppun, President
Hui Malama Aina 'O Koolau
March 21, 1983
Page Three

Services and Public Facilities

Your comment regarding the provision of services implies that existing taxpayers will pay for the subdivision's needs. However, the cost of services and public facilities will be spread among all taxpayers including residents of the proposed subdivision. This, of course, is true of any subdivision.


Need of Project

The proposed project will serve many people. Included in this group are prospective low and moderate income homeowners, middle income homeowners, i.e. the working class, existing residents of the area who have to rely on cesspools which are subject to failure; merchants of the Kaneohe area who have goods to sell, people looking for employment through public facilities such as solid waste collection, sewage treatment personnel, police, and firemen. In short, the project can and will serve many people.

We hope the foregoing information addresses your concerns. Your letter as well as this response will be a part of the Final EIS. We appreciate your participation in the EIS review process.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

8111 A19

Date Received MAR 11 1983

File: _____

To: DB

9 March 1983

Action: _____

To: Gray, Hong Assoc., Inc.
116 S. King St., Rm. 508
Hon., Hi. 96813

Regarding: Environmental Impact Statement for the proposed Heeia-Kea Subdivision

Hui Malama feels that the overall problem with the EIS is a very narrow and erroneous definition of the word "cumulative". In your EIS you talk about the cumulative impact of various aspects of this one project, while almost totally ignoring the cumulative impact of this project when combined with other proposed projects. If you were at all interested in the welfare of the whole Heeia-Kualoa community, you would realize that the failure to look at the combined impacts of different projects destroys any attempts to plan for the future of the whole community.

For example, you say that the water supply on the Windward side is adequate, and that a Water Master Plan will be prepared to demonstrate the existing systems adequacy. Where is the master plan so that we can judge for our selves what the effect of this and other proposed projects will be on our streams, on our agriculture, on our fishing, on our recreation options? Are you aware that the Windward side is now subject to minimum stream flow regulations? You have presented no facts to back up your claim that the amount of water needed for this project is "not of significant magnitude."

The same lack of information characterizes your claims that the erosion controls (again, where is the proposed Erosion Control Plan) will prevent harm to Class AA waters. Again, cumulative effects must include other proposed projects. You also fail to identify the kinds or amounts of pollutants that will run off of streets and driveways of a project of this size into Kaneohe Bay.

Although you do admit that this project will have a detrimental effect on traffic on Kamehameha Highway and on the Kahekili - Likelike intersection, you again fail to identify cumulative effects. You even make the statement that traffic on Kam Hwy will be tolerable. On what authority do you make that claim? You avoid the problem of the possible need to widen Kam Hwy, by pretending that the lots along the road are not part of the subdivision. Yet you do state that the substandard houses that are there now will be replaced with homes built to code. If those lots are not part of the subdivision, then why are you going to evict the people? Hui Malama has claimed all along that the building of H-3 will open our community up to development. This EIS proves us right, because in it you claim that any traffic problems will be solved when H-3 is built. Of course you are assuming that all these new Heeia residents will be going to Aiea, and you forget that even the State Department of Transportation has said that by the time it is built, H-3 will be obsolete. One final point on transportation; you say that "buses will be provided" to accomodate increased need because of all these new people. Who will provide them?

Hui Malama is also concerned about other impacts of this project. In response to the Parks and Recreation question about park availability, you say that the Heeia pier is available for use by this subdivision. Yet you claim that this project will not hamper access to the pier? Prove it.

There is no information about the City's timetable for building sewer facilities. Do the City's plans coincide with the timetable for the building of this project?

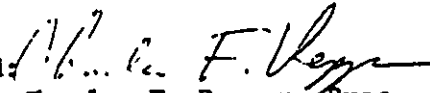
Your agriculture feasibility study says that at least 40-45 acres of the Lahina Silty Clay soil "would provide a good medium for the production of bananas and

and truck crops...". Yet you claim that this land is not good for farming because: There is no water, and the land is not presently used for agriculture. There are many farmers making a decent living using City water. What is the potential of the spring? Of course there is no farming on the land now. Many long time residents have been evicted, and the rest can't get leases. Some of the present residents are providing food for themselves and supplementing their incomes by back yard farming. In fact, although your history doesn't show it, the land was used for farming at one time. Some of the older residents, who grew up there, have said that the lower part of the valley was extensively cultivated. Your agriculture study also claims that this project will have no effect on the amount of prime ag land on Oahu. What about the effect on the amount of ag land in Koolaupoko? Won't it make farm land more expensive in this area? What about the cumulative impact of this project and others on the amount of farm land in the Kualoa-Heeia area? Profitability and market potential are not the only criteria for judging agriculture viability. Subsistence farming is very important in our community. The less land there is for both commercial and subsistence farming, the more people have to find outside jobs (and transportation) to support their families. In the long run this project could take jobs away from our community.

Besides the loss of long term agricultural employment, this project will cost taxpayers money to hire more police, firemen, and refuse workers. This project will generate approximately 12,000 lbs of garbage a day (1,000 people x 12lbs/person). Will our taxes be able to pay for all these needed services?

Who is this project really for? Your marketing report is based on a number of assumptions and misstatements. You provide all the figures to prove that we need single family housing. Yet you fail to mention the most crucial cause of this need: in-migration from the rest of the States. Ultimately, this project is not, as you say, to "serve the residents of Oahu." Our natural growth rate is less than half the in-migration rate. One of the studies you site, (Alfred Gobar Associates) says: "What is needed is more low cost single family housing." What you are building is not what we need. It is housing for the investor market. Investor demand is barely mentioned in this EIS as a cause for the high cost of housing. Isn't speculation on land and housing actually one of the major causes? Where are the figures on the amounts of land planned for residential use on this island? Is there enough? Do we really need this project to take care of our projected population increase? Your statements that you are providing low income housing by providing medium income housing (when the middle class moves into better homes, the lower class moves into the vacated houses) are despicable. Just because someone has a low paying job, they don't deserve a nice place to live? You need someone to pick up your garbage, but they can't live in a nice place.

Hui Malama also finds it incredible that a public utility is in the development business, and that a consultant hired by HECO is given the EIS housing market analysis job by an engineering firm hired by HECO not only to do the EIS, but also to do the engineering for the project. Naturally there will be no significant impacts on anything.

Signed: 
Charles F. Reppun, Pres.
Hui Malama Aina 'o Koolau
c/o 47-410 Lulani St.
Kaneohe, Hi. 96744

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

Ms. Lola Mench
Honolulu Group Conservation Committee
Sierra Club, Hawaii Chapter
P. O. Box 22897
Honolulu, Hawaii 96822

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Ms. Mench:

We have received a copy of your letter to Department of Land Utilization dated March 10, 1983 regarding the subject project, and are providing the following responses to your comments.

Drainage and Water Quality

We received consultation comments from various parties including Sierra Club, Hawaii Chapter, which expressed concern that sedimentation and runoff be addressed adequately with particular respect to water quality. As a result of these comments, the Draft Environmental Impact Statement (EIS) described the proposed drainage system and contained a Preliminary Hydrologic Map (Figure 7) showing how existing and anticipated runoff flows were calculated. The methodology utilized was the Rationale Method which is standard engineering practice for this type drainage area and is based on area, intensity and an application factor for the type of terrain reflecting ability of the surface to absorb water.

With respect to sedimentation and erosion, the Draft EIS specifically states that sedimentation and erosion is potentially a problem during construction if adequate erosion control measures are not employed and the effectiveness of erosion control is directly related to effectiveness of the measures taken. We believe this is an accurate assessment. The erosion control measures to be employed will be in conformance with an erosion control plan as approved by the City and County of Honolulu.

Your letter cites general statements made within the section entitled, "The Relationship of the Proposed Action to Land Use Plans, Policies, and Control for the Affected Area". These general statements have been made based on the more detailed description contained in Section II (Description of the Proposed Action) and Section IV (Description of the Environmental Setting and the Probable Impact of the Proposed Action).

Ms. Lola Mench
Honolulu Group Conservation Committee
March 21, 1983
Page Two

Archaeology


An archaeological reconnaissance was conducted and included as Appendix C of the Draft EIS. The appendix was summarized in the text. The Final EIS will be revised to state that additional appropriate archaeological work will be necessary. This work may take the form of test trenches, stratigraphic work and monitoring during construction. The scope of work will be subject to approval of the Historic Sites Section of the Department of Land & Natural Resources.

Traffic

The Draft EIS analyzed traffic on Kamehameha Highway and recognized that this project will add to traffic at existing intersections which are congested, such as the Kahekili/Likelike Highway intersections. With respect to Kamehameha Highway, the anticipated traffic volumes will be within a range which is tolerable. With respect to the Kahekili/Likelike Highway intersection, H-3 will definitely have a favorable impact on existing congestion. The Draft EIS does not state that H-3 will improve traffic conditions on Kamehameha Highway.

We thank you for your comments and participation in the EIS review process.
Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

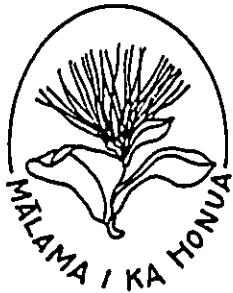


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Department of Land Utilization

1032



SIERRA CLUB, HAWAII CHAPTER
P.O. BOX 22897 HONOLULU, HAWAII 96822
(808) 946-8494 March 10, 1983

Date Received MAR 11 1983

To: DB
Action: _____

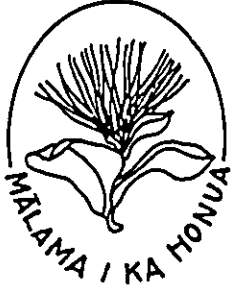
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th floor
Honolulu, Hawaii 96813

Re: Draft EIS for Heeia Kea Subdivision

In reviewing this draft, we find that the impacts that are of concern to us, i.e., the effects on the waters of Kaneohe Bay via water and silt run-off are also of concern to the State OEQC, DOH, DPED, the City Director and Chief Engineer, the U.S. Soil and Conservation Service and Fish and Wildlife Service, Hui Malama, Kahaluu N.B., Heeia Community Association. In light of this much concern, we feel that the draft has attempted to minimize the problem and to simply assure that the concern will be addressed, without giving solutions. For example, on page 39, under Objective A(4): "There are no flood or erosion hazards associated with the development." This statement is contrary to expressed concerns and analysis. Again, under Objective A(7): "Based on air, water quality, and noise analysis prepared in conjunction with this document, no damaging effects are anticipated". This is in contradiction to analysis, which admits that at least during construction phase, preventing pollution to Kaneohe Bay will be a problem and also admits that water-run-off into the Bay will be increased by 20%. On page 37, under 3. Natural Environment, "The proposed development will not involve the adjacent shoreline". Silting does most certainly involve the adjacent shoreline. In addition, a proposal this large will most certainly involve shoreline recreational use. The increase of automobiles on the highway in this area will involve the shoreline and the waters, since the toxic substances from the automobiles will run off into the waters.

Since we disagreed with the increased run-off figure of 15 to 20%, we have searched the draft EIS to find supporting studies for this estimate but have found none.

We did not question the archaeology in our original letter, but in reading the draft, we noted that a stratigraphic look at the property



SIERRA CLUB, HAWAII CHAPTER

P.O. BOX 22897 HONOLULU, HAWAII 96822

(808) 946-8494

March 10

-page 2-

Re: Draft EIS for Heeia Kea Subdivision

was recommended, since there is believed to be a good possibility that subservice features exist at Heeia Kea. In the discussion of the archaeology, this possible feature was not mentioned and the archaeological value of the area was down-played.

The Draft EIS has failed to respond to alternative suggestions which include planning for contouring rather ^{than} planning for a great deal of earth moving.

The increased traffic and traffic hazards on this narrow road have not been adequately dealt with. Any proposed highway improvements, including H-3 will do nothing to mitigate the problem in this whole stretch of road. If anything, the larger highway improvements will increase traffic as they stimulate development.

Thank you for permitting us to comment.

Lola Mench

Lola Mench

Honolulu Group Conservation Committee

**GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS**

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

Dr. Doak Cox, Director
Environmental Center
University of Hawaii
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Dr. Cox:

We have received a copy of your letter to Department of Land Utilization dated March 10, 1983 regarding the subject project, and are providing the following responses to your comments.

Archaeology

A substantial portion of your comments are related to archaeology. We have asked the archaeological consultant, Mr. Joseph Kennedy, to respond to most of these comments. His letter is attached and appropriate mitigation measures will be incorporated in the mitigation section of the Final EIS.

The second paragraph of the archaeological section references omissions and inadequacies between the archaeological appendix (Appendix C) and the text. The Final Environmental Impact Statement (EIS) will be revised to include appropriate language in the mitigation section stating that additional work will be subject to the approval of the Historic Sites Section of the Department of Land and Natural Resources. The work will include, as necessary, test trenches, stratigraphic work, site preservation and monitoring during construction.

Reference is also made in the second paragraph that statements on page 45 and 84 are inconsistent. We do not share this opinion, but we recognize varying sensitivity by reviewers. Only one of five sites was identified during the field reconnaissance as having value and this was stated on page 45. Page 84 states that no significant historical sites or archaeological artifacts have been documented. This statement was made since the archaeological reconnaissance states that "some thought" should be given to restoration/preservation not particularly due to the value of the structure, but rather, base on the fact that this type of feature is in a category of "rapidly diminishing resources". Regardless of our wording and your reviewer's reaction, the matter will be resolved in the Final EIS mitigation section.

Dr. Doak Cox, Director
Environmental Center
March 21, 1983
Page Two

Possible Alternatives to the Proposed Action

The Final EIS will be expanded to discuss alternative housing, i.e. cluster housing. We do not think Planned Development Housing is appropriate for an area which is predominantly single-family residential.

As you point out, the advantage of concentrating housing is that potential soil erosion and potential sedimentation to Kaneohe Bay can be reduced. As pointed out in the Draft EIS, this would be advantageous if a significant impact was imminent. However, there will be adequate safeguards employed to keep sedimentation to Kaneohe Bay to a minimum.

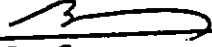
Drainage Improvement/Flood and Coastal Hazards

The Draft EIS does assess the statement "... Undetermined but possible, flood hazard." This phrase relates to the Federal Flood Insurance Program and basically means that the project site is not within an area covered by the City and County's Flood Hazard Districts Ordinance (80-62). Regardless of how the site is affected by the City's Ordinance, a Drainage Report is required. The Draft EIS assessed drainage.

We thank you for your comments and participation in the EIS review process.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032

XIII A21



JOSEPH KENNEDY
Archaeologist

ARCHAEOLOGICAL CONSULTANTS
of
HAWAII

3060 Huelani Dr.
Honolulu, Hawaii 96822
(808) 988-6307

March 16, 1983

Mr. David Bills
Gray, Hong and Associates
116 South King Street
Room 508
Honolulu, Hawaii 96813

Dear Mr. Bills:

Thank you for the opportunity to respond to the comments made by the archaeologist at the Environmental Center regarding my work done at Heeia Kea.

To begin with, I found the reviewer's criticisms and suggestions to be very thorough and in some cases instructive. There are, however, some comments that I would like to address at this time. First, the reviewer asks if any substantive historical research was carried out and goes on to say that the historic perspective in my report begins with the 1930's and ignores pre or early 1900 occupation of the land. The answer to the first question is no: my report was a preliminary one that was designed to determine the presence or absence of archaeological sites on the 100 or so acres of the subject parcel and about all of my time was devoted to this end. I would like to point out that my brief overview of the post-contact activities on this parcel did include examination of an Alexander and Baldwin map prepared in 1913 and another one dated 1916, so early 1900 occupation of the land was certainly not "ignored". This is not to say that more historic work does not need to be done. I am in agreement with the reviewer that it would be well worthwhile to significantly expand the historical overview concerning this piece of property.

The same thing can be said for the archaeological work at Heeia Kea. However, it must be remembered that my report was a preliminary one designed to identify any archaeological sites on the property, and fix their approximate location on the proposed subdivision plan map. This report does not preclude the possibility of more archaeological salvage type work or subsurface testing. I am, in fact, quite in agreement with the reviewer when he says that "excavation of these features could provide significant archaeological information on the area", but I can't see this work "only involving a day or two of work". I am also aware of the possibility of alluvial progradation at Heeia Kea and the possibility

David Bills
Gray, Hong and Associates
March 16, 1983
page 2

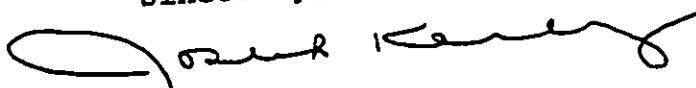
of a buried strandline. However, investigation of both these possibilities lies well beyond the scope of the report in question and, as the reviewer implies, could be addressed in a follow up Phase II salvage report. A series of core samples or test trenches could be enough to determine if there truly is an earlier, buried beach or strandline.

In the third paragraph of page 2 the reviewer asks why significance and size of the historic bottle dump were not determined and why it was not designated as a site. The location of the bottle dump was clearly placed on the map entitled "Archaeological Sites at Heeia Kea, Archaeological Consultants of Hawaii of November 1982", along with the other five sites. I was not able to determine size and significance or really say much more about it within the scope of this work. To merely find the boundaries and determine depth of the deposit in the thick jungle would have taken many hours and this time was needed to complete sweeps of the remaining unsurveyed property. Again, this is not to say that the work should not be done. A historic bottle dump is clearly an archaeological site and needs to be investigated as such.

The reviewer makes an excellent point concerning archaeological monitoring. To simply observe the destruction of subsurface features as they are uncovered would be futile and to halt construction at the land clearing and grubbing phase of development (except in an emergency) would be time consuming and costly. As suggested, a program of subsurface testing prior to construction would be advantageous to all parties. After this has been completed an archaeologist should be on hand to deal with any additional and unexpected features or burials.

If you have any further questions regarding my report, please feel free to contact me.

Sincerely,



Joseph Kennedy

JK:kc



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

MAR 11 1983
To: _____
From: _____
Subject: _____

March 10, 1983

Department of Land Utilization
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Draft Environmental Impact Statement
Heeia Kea Subdivision
Heeia, Koolaupoko, Oahu, Hawaii

To Whom It May Concern:

The Environmental Center review of the above cited document has been prepared with the assistance of Donald Bell, Real Estate; Bill Burke, General Science; Paul Ekern, Agronomy & Soils; Matthew Spriggs, Anthropology; Tyrone Reinhardt, Hawaiian Culture; Jacquelin Miller and Pamela Bahnsen, Environmental Center.

Archaeological

The EIS preparation notice states that "Archaeological/historical work will be conducted to identify any impacts". In addition, in a reply to Leialoha Kaluhiwa for the Heeia Kea Community Association (letter of December 23, 1982) who called for "A complete archaeological and historical study of the area." Gray, Hong and Associates stated (letter of January 24, 1983) that "An archaeological reconnaissance of the site with historic perspective will be a part of the EIS." Was any substantive historical research carried out? The "Historic Perspective" as given starts in the 1930's which ignores the potentially highly significant pre- or early 1900's occupation of the land and its historical significance. It is most surprising that there is no reference to D. M. Devary et al's study "Kane'ohe: A History of Change", prepared in 1976 for the US Army Corps of Engineers and recently reprinted by Bess Press. This volume is a narrative history of land and water use in the Kaneohe Bay and contains numerous references to Heeia which could have formed the basis for a historical overview of the Heeia Kea property. Such an overview is a necessary part of any archaeological reconnaissance, particularly as it helps identify potential kinds of archaeological sites which might be expected on the parcel. Land Commission Awards information in particular is most helpful in this determination.

While the physical reconnaissance of the site appears adequate in coverage, the conclusions and recommendations of the archaeological report are inadequate or omitted in the other sections. For example, the archaeological report recommended preservation of site ACH-HK-4, however, this is not addressed in the DEIS Mitigation Section (pages

84-86). Inconsistencies are also noted. On page 45 it is stated that "only one (emphasis added) of the five located sites appears to have any value", yet on page 84 that site is omitted and the statement is made that "no (emphasis added) significant historical or archaeological artifacts have been documented". On page 45 it is noted that "It is the recommendation of the archaeologist to have grubbing and earthwork activities monitored as a precaution should subsurface features be encountered." However, nowhere in the DEIS is any guarantee given that this recommendation will be followed. A discussion of these issues is needed.

In Appendix C of the DEIS the conclusions and recommendations of the archaeological reconnaissance at Heeia Kea can be challenged. It seems unjustified to conclude that "The three minor terraces/mounds remaining on the property together with HK-5 are of little archaeological consequence . . ." The significance of the 3 terraces/mounds lies in the fact that they are the only remaining surface agricultural features left in Heeia Kea. Further investigation including excavation and dating of the mounds seems justified on this basis. They may provide the only clues as to when agricultural exploitation of the area took place in prehistory. Excavation of these features would only involve a day or two of work but could provide significant archaeological information on the area.

The significance of HK-5 is its probable religious function and association with HK-4. As no distance is given between them except that they are in "close proximity" the possible association is hard to evaluate. The report does not discuss the possibility that this platform is a burial structure. Again archaeological testing should be undertaken before construction is allowed to proceed. HK-4 is clearly a significant structure and the recommendation for its preservation should have been put in stronger terms than ". . . some thought should be given to the restoration and or preservation . . ." Sites HK-4 and HK-5 should be preserved as examples of traditional Hawaiian religious structures. They appear to be on the edge of the parcel and so preservation should not be an inconvenience or economic hardship to the developer.

The report mentions, but surprisingly does not designate as a site, a historic bottle dump (presumably associated with a habitation area) which is described as ". . . of undetermined size and significance . . .". The reconnaissance report should have addressed the significance of this site including age of the bottles and whether an associated historic habitation site was searched for in the area. Why were significance and size not determined?

In the map of HK-5 a "depression" is marked in the structure but the brief description given of the site makes no mention of this. It should be mentioned that such "depressions" are often found in the top of burial structures. Was the depression part of the original construction of the mound?

Given the nature of the soils on the site (Lahaina Silty Clay and Ewa Silty Clay) which are alluvial, the possibility of buried features should have been addressed in some detail. Subsurface testing would have been appropriate, particularly as the Ewa Silty Clay is on top of coral limestone suggesting shoreline progradation and the possibility of a prehistoric beach or strandline at the makai edge of the parcel. Test pits along the makai edge should be dug to investigate the possibility of buried sites associated with an early shoreline. Test pits or cores should be placed elsewhere to investigate subsurface stratigraphy. It is not noted in the report whether the "deeply cut ravines" were inspected to examine alluvial stratigraphy and assess the possibility of buried cultural horizons.

If not this should be done as such cuts are often instructive in this regard. Indeed the archaeologist mentioned that ". . . there is a good possibility that subsurface features exist at Heeia Kea". However, it would seem most inadvisable to wait until construction begins and then merely monitor it. If significant remains were to be located, would the archaeologist have the power to stop construction or just watch the sites being destroyed? If the latter, then such monitoring would seem merely futile. If the former then considerable time and expensive delays in construction might result. A program of subsurface testing prior to construction would seem justified to check for buried subsurface remains.

In summary, the archaeological report is inadequate in its presentation, conclusions and recommendations. The historical research is insufficiently presented to permit adequate evaluation of the historical significance, and therefore likely archaeological significance of the parcel. The significance of the sites found has not been adequately addressed nor has adequate attention been paid to the nature of the soils and the possibility of buried archaeological remains. The recommendations of the archaeologist are thus inappropriate. Monitoring during construction is not an adequate mitigation measure for any possible buried sites. Their potential should be investigated prior to construction by a program of test excavation and coring. The archaeological sites HK-4 and HK-5 should be preserved as significant religious structures. Sites HK-1, HK-2, and HK-3 should be further investigated as to function and date by excavation before they are destroyed. Proper evaluation of the bottle dump and its environments should be included in a revised archaeological report. The mitigative measures which the developer is to undertake should be spelled out in the appropriate section of the Revised EIS.

Possible Alternative To The Proposed Action

On reviewing the Heeia Kea Residential Subdivision development we note that a majority of the 87+ acres of land to be developed will need to be graded (ie 50+ acres) (pp. 9-10).

We note on page 1 that ". . . other options were explored leading to the proposal to construct the 389-lot Heeia Kea Subdivision." What were these other options? Was a townhouse cluster development a consideration? If not we would like to suggest that its potential viability as an alternative be addressed in the Revised DEIS. A Planned Development could have environmental advantages along with possible financial savings to both the consumer and developer. One significant environmental benefit would be less development of the open space through the concentration of units. As recognized (pg. 82) clustering of units could reduce the number of streets needed, grading, the quantity of resultant soil erosion, and could perhaps lessen and control costs thereby assisting the developer to attain his objectives of ". . . some low and moderate cost units . . ." (p. 34) along with providing ". . . housing in the median-income price range . . ." (p. 34).

Drainage Improvement/Flood and Coastal Hazards

We suggest that the Revised EIS fully address the assessment of the ". . . undetermined, but possible, flood hazard." as referred to on pages 17 and 46 of the DEIS.

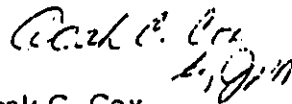
Fauna

We concur with the environmental statement that there will be minimal biological impacts as a result of this development.

March 10, 1983

We appreciate the opportunity to comment on this DEIS and hope that you will find our comments useful in the preparation of the revised document.

Yours truly,



Doak C. Cox
Director

cc: Gray, Hong, and Associates, Inc. ✓
Hawaiian Electric Company
Donald Bell
Bill Burke
Paul Ekern
Matthew Spriggs
Tyrone Reinhardt
Jacquelin Miller
Pamela Bahnsen

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.O. BOW, PE

Mr. Ryokichi Higashionna, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Higashionna:

We have received a copy of your letter to Department of Land Utilization dated March 7, 1983. Unfortunately, we received our copy five days after the March 10, 1983 comment deadline. We are providing the following responses to your comments, but we will not be able to revise the actual text. However, we believe these responses will answer your comments.


The proposed residential subdivision will generate its peak traffic during the work week at the recognized morning and afternoon peak traffic periods and not during weekends. A spot traffic count was made at the proposed intersection (Intersection A) in conjunction with the air quality study. As presented in the air quality appendix (Appendix E), 27 vehicles turned into the harbor and 3 left the harbor during the spot check. These levels of harbor traffic were not considered significant to the peak hour analysis. If the State conceptual harbor expansion plans are implemented, we believe the State has responsibility to provide Kamehameha Highway improvements and ensure proper ingress and egress to the Boat Harbor. However, based on the Heeia Kea Subdivision Conceptual Intersection Plan (Figure 6), any improvements (left turn storage, acceleration lanes and deceleration lanes) required for the Boat Harbor can be readily accommodated in the proposed intersection for the residential subdivision.

With respect to the proposed sewer line along Kamehameha Highway, we do not know if this line has been sized to accommodate all present and future boat harbor needs. The City informs us that this is an area requiring additional evaluation.

We thank you for your comments.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.


Brian L. Gray

DB:crd
cc: Cowell & Company, Inc.
Dept. of Land Utilization
1032

XIII A22

GEORGE R. ARIYOSHI
GOVERNOR

MAR 15 1983



Date Received _____

File: _____

To: _____

STATE OF HAWAII: _____
DEPARTMENT OF TRANSPORTATION
859 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

RYOKICHI HIGASHIONNA, Ph.D.
DIRECTOR

DEPUTY DIRECTORS
WAYNE J. YAMASAKI

JAMES B. McCORMICK
JONATHAN K. SHIMADA, Ph.D.

IN REPLY REFER TO:

STP
3.8628

March 7, 1983

Mr. Michael McElroy
Department of Land & Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Draft EIS for Heeia Kea Subdivision;
Heeia, Koolaupoko, Hawaii

We have reviewed the subject draft EIS and offer the following comments.

Figures 15 and 16 represent two intersections with Kamehameha Highway where ingress and egress of the subdivision will occur. One of them (it is not clear which one) is located directly opposite the entrance to our Heeia-Kea Boat Harbor Facility. As such, we would like to point out that peak harbor traffic can be significant especially during the weekends and when fishing is good. We noted that the traffic movements and counts shown at the two intersections do not consider boat harbor traffic since there is no indication of traffic entering or leaving the harbor. We feel a potentially hazardous condition can occur particularly when peak harbor traffic coincides with peak Kamehameha Highway traffic. Further, future expansion of the harbor will compound the problem. Therefore, we suggest that an analysis and discussion of this scenario be presented in the EIS including modifying Figure 15 or 16 to show traffic movements in and out of the harbor facility.

XIII B22

Mr. Michael McElroy
Page 2
March 7, 1983

STP 8.0928

For your information, Kamehameha Highway at these two intersections is under the jurisdiction of the City and County of Honolulu.

On another matter, we assume the proposed sewer line along Kamehameha Highway to service the subdivision will be able to accommodate all present and future boat harbor needs.

Very truly yours,

Ryokichi Higashionna
Director of Transportation

RK:gm

cc: Gray, Hong and Associates, Inc.
Hawaiian Electric Company
HWY-PS
HAR

XIII 822

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

March 21, 1983

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

The Honorable Susumu Ono, Chairman
State of Hawaii
Board of Land & Natural Resources
Department of Land & Natural Resources
Kalanimou Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Ono:

We have received a copy of your letter to Department of Land Utilization dated March 7, 1983 regarding the subject project. We have also received your additional letter dated March 7, 1983 to our office. We are providing the following responses to your comments.

Erosion and Sedimentation

The Draft Environmental Impact Statement (EIS) states that erosion and sedimentation during grading can cause adverse environmental effects if not properly controlled. The Draft EIS also states that the amount of environmental degradation is directly related to the effectiveness of the temporary erosion control measures. As you have noted, the EIS states that filter berms, sediment traps, ponds and incremental grading will be used to provide erosion control. For clarification, the incremental grading will be done in a fashion that each increment is graded before a subsequent increment is opened. All of this work will be performed in accordance with an erosion control plan approved by the City and County of Honolulu.

Water Supply

The Board of Water Supply has been consulted and their consultation comments as well as Draft EIS comments will be addressed in the Revised EIS.

Recreation

Reference to Heeia State Park as a recreational facility in the Heeia area is made on page 75 in the subsection entitled, "Recreation".

The Honorable Susumu Ono, Chairman
March 21, 1983
Page Two

The EIS notes that there are no plans for the use and management of the 116 acres conservation lands above the proposed subdivision except to maintain them as they presently exist.

Sewer

Off-site sewers will be constructed as a part of the subdivision. The opportunity for connection exist and both facility plans (Figures 8 and 9) show a master planned sewer connection for Heeia Kea Boat Harbor. We believe it is the intent of the City and County that the Heeia State Park be connected.


Historic Sites

We have asked Mr. Joseph Kennedy, the archaeological consultant to respond to your comments regarding Historic Sites. His responses are attached.

We thank you for your comments.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd.

Enclosures

cc: Cowell & Company, Inc.
Dept. of Land Utilization

1032



JOSEPH KENNEDY
Archaeologist

ARCHAEOLOGICAL CONSULTANTS
of
HAWAII

3060 Huelani Dr.
Honolulu, Hawaii 96822
(808) 988-6307

March 16, 1983

Mr. David Bills
Gray, Hong and Associates
116 South King Street
Room 508
Honolulu, Hawaii 96813

Dear Mr. Bills:

Thank you for the opportunity to reply to Mr. Susumu Ono's letter of March 7, 1983 concerning historic sites section of the draft EIS, proposed Heeia Kea subdivision. I will restate the four comments and address each one separately.

1. Salvage excavations should be conducted at all sites prior to destruction. The data recovery program should include identification of excavated plant remains, radiocarbon dating of sites and features, spatial analysis of artifacts and sites, and preparation of a final report, including photographs, to be sent to our historic sites office.

Response: I agree that a more complete archaeological understanding of the few remaining sites at Heeia Kea should be attempted and especially since there is a possibility that these sites will be 100% impacted (destroyed) by the proposed development. Because it seems unlikely that any of these features were habitation sites a series of test trenches may be the most practical method of determining the profiles or archaeological assemblages needed to establish function and age of the site. Should preliminary excavations expose significant cultural layer, a more elaborate horizontal investigation could be initiated at that point. Naturally, a final report detailing the results of these excavations will be prepared and should include (when possible) the identification of plant remains, radiocarbon dates, spatial analysis of any artifacts and photographs.

2. All ground disturbing activities should be monitored closely by a qualified professional archaeologist, and additional salvage excavations should be conducted if significant subsurface deposits are discovered.

Response: As I pointed out in the conclusions and recommendations section of my reconnaissance report, Heeia Kea was most likely the

David Bills
Gray, Hong and Associates
March 16, 1983
page 2

locus of prehistoric activity and that there is a good possibility that subsurface features exist there - including the possibility of burials. I also mentioned that the stratigraphic information for the Windward coast is particularly weak. For these reasons I fully support the recommendation that an archaeological monitoring program be established prior to all ground disturbing activities.

3. All archaeological fieldwork should be closely coordinated with our staff archaeologists.

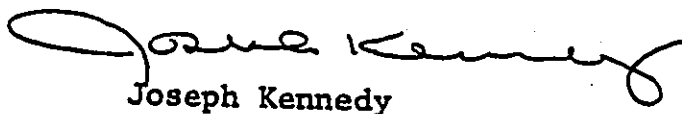
Response: It would be well worthwhile to have all fieldwork closely coordinated with the staff at SHPO.

4. The two shrine sites, identified in the reconnaissance report as HK-IV and HK-V, should be preserved, including a 100-foot buffer zone and reasonable public access.

Response: A nicely formed religious structure like HK-IV represents a rapidly diminishing cultural resource in this State and the preservation and restoration of this family altar would lend a degree of integrity to this property. HK-V on the other hand is not nearly as impressive as the aforementioned structure and may, in fact, be a burial. HK-V should be investigated, but not necessarily preserved. A more enlightened decision on this matter may be made after some subsurface investigation.

Should you have any further questions or comments regarding my report, please feel free to contact me.

Sincerely,



Joseph Kennedy

JK:kc

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



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

Date Received 7 1983
File: _____
DB
Action: _____

SUSUMU ONO, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES
EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

DIVISIONS:
AQUACULTURE DEVELOPMENT
PROGRAM
AQUATIC RESOURCES
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

MAP

Mr. Brian L. Gray
Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

ATTENTION MR. DAVID B. BILLS

Dear Mr. Gray:

SUBJECT: Draft EIS, Proposed Heeia Kea Subdivision
Heeia Kea, Oahu, TMK 4-6-06: 1, 2, 4,
7-16, 22-51; 4-6-16: 32

Thank you for your letter of February 7, 1983, and for the opportunity to comment on the proposed undertaking.

For your information, we do not recommend that complete reports of archaeological reconnaissance surveys be included in the Environmental Impact Statements. Such reports contain much site specific information, which when placed in a public document encourage people to seek out and destroy the sites by removing the artifacts. We request a copy of your consultant's archaeological reconnaissance report be sent to our office for review and comment, as well as future use and reference.

Sincerely yours,

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

Susumu Ono
Chairman and
State Historic Preservation
Officer

cc: Department of Land Utilization
City and County of Honolulu

XIII B23

MAR 7 1983

Department of Land Utilization
City and County of Honolulu
650 So. King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

We appreciate the opportunity to review the draft environmental impact statement for Heeia Kea Subdivision. We have a number of concerns regarding this project.

Erosion and Sedimentation

A primary concern is the potential erosion and sedimentation resulting from grading large areas for residential development. Adequate erosion-sedimentation control measures should be implemented during and after the grading operation. In addition, an adequate drainage system with appropriate silting basins should be installed so as to minimize degradation of the nearby offshore waters.

We note current proposals presented in the draft environmental impact statement include use of filter berms, sediment traps and ponds, limiting grading to a maximum of twenty acres at any one time and grading only during the drier seasons. We encourage the proposal to complete grading and grassing of sections prior to initiating grading in a new area.

Water Supply

We understand that the Board of Water Supply has been consulted, and their comments and requirements addressed.

Recreation

The section on recreational resources should include Heeia State Park (page 44). The steep land within the property line of the subject project could have some recreation value. We note an unimproved road already provides some access to this area and two access ways have been provided. The use and management of this area should be addressed.

Dept. of Land Utilization
RE: Heeia Kea Subdivision DEIS
Page Two

1983

A sewer line from the proposed subdivision to the existing county sewer system would pass by Heeia State Park. We would, therefore, like to have the opportunity to connect the park sewer system to the proposed sewer line.

Historic Sites

The proposed undertaking will have an adverse effect on archaeological resources in the project area. The following mitigation measures are recommended, and should be included in the final environmental impact statement:

1. Salvage excavations should be conducted at all sites prior to destruction. The data recovery program should include identification of excavated plant remains, radiocarbon dating of sites and features, spatial analysis of artifacts and sites, and preparation of a final report, including photographs, to be sent to our historic sites office.
2. All ground disturbing activities should be monitored closely by a qualified professional archaeologist, and additional salvage excavations should be conducted if significant subsurface deposits are discovered.
3. All archaeological fieldwork should be closely coordinated with our staff archaeologists.
4. The two shrine sites, identified in the reconnaissance report as HI-IV and HK-V, should be preserved, including a 100-foot buffer zone and reasonable public access.

Sincerely,

Susumu Ono

SUSUMU ONO
Chairman of the Board
and
State Historic Preservation Officer

cc: ✓ Gray, Hong & Associates
Hawaiian Electric Co.

XIII B23

GRAY, HONG & ASSOCIATES, INC.
CONSULTING ENGINEERS

BRIAN L. GRAY, PE
DANIEL S.C. HONG, PE
DAVID B. BILLS, PE
RAYMOND M. SANTO, PE
WILLIAM H.Q. BOW, PE

March 21, 1983

Mr. William A. Bonnet, Director
Department of Transportation Services
City and County of Honolulu
650 S. King Street, 3rd Floor
Honolulu, Hawaii 96813

SUBJECT: Heeia Kea Subdivision
Draft Environmental Impact Statement

Dear Mr. Bonnet:

We have received a copy of your memorandum to Department of Land Utilization dated March 7, 1983 regarding the subject project. We are providing the following information in response to your comments.

1. We are enclosing Exhibits I & II of the Haiku/Lilipuna Intersection which show morning and afternoon existing traffic as well as projected traffic from the project. We are also enclosing calculations for critical lane movements based on Northwestern University's Traffic Institute (Subject: Traffic Control, Title: Evaluation of Critical Land Movements). Based on the enclosed exhibits and accompanying calculations, the Haiku/Lilipuna Road Intersection will be close to capacity, but less than the maximum recommended value. Based on the critical lane analysis, 1,500 vehicles represents maximum capacity. The morning analysis (Exhibit I) produces a critical lane volume of 1,290 vehicles and the afternoon analysis (Exhibit II) provides a critical lane volume of 1,430 vehicles.
2. Figures 15 and 16 are schematic diagrams to indicate traffic counts and turning motions resulting from ultimate completion of the project. Figure 6 has been provided to illustrate a conceptual intersection plan and design criteria. We anticipate the length of lanes will be resolved during the design phase and we see no difficulty in modifying lengths based on good engineering principles.

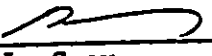
Mr. William A. Bonnet, Director
Department of Transportation Services
March 21, 1983
Page Two

3. It was the intent that bus service be available along Kamehameha Highway and not actually within the subdivision. We will clarify this in the Final EIS.

Thank you for your comments and they will be incorporated into the Final EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.



Brian L. Gray

DB:crd

cc: Cowell & Company, Inc.
Department of Land Utilization

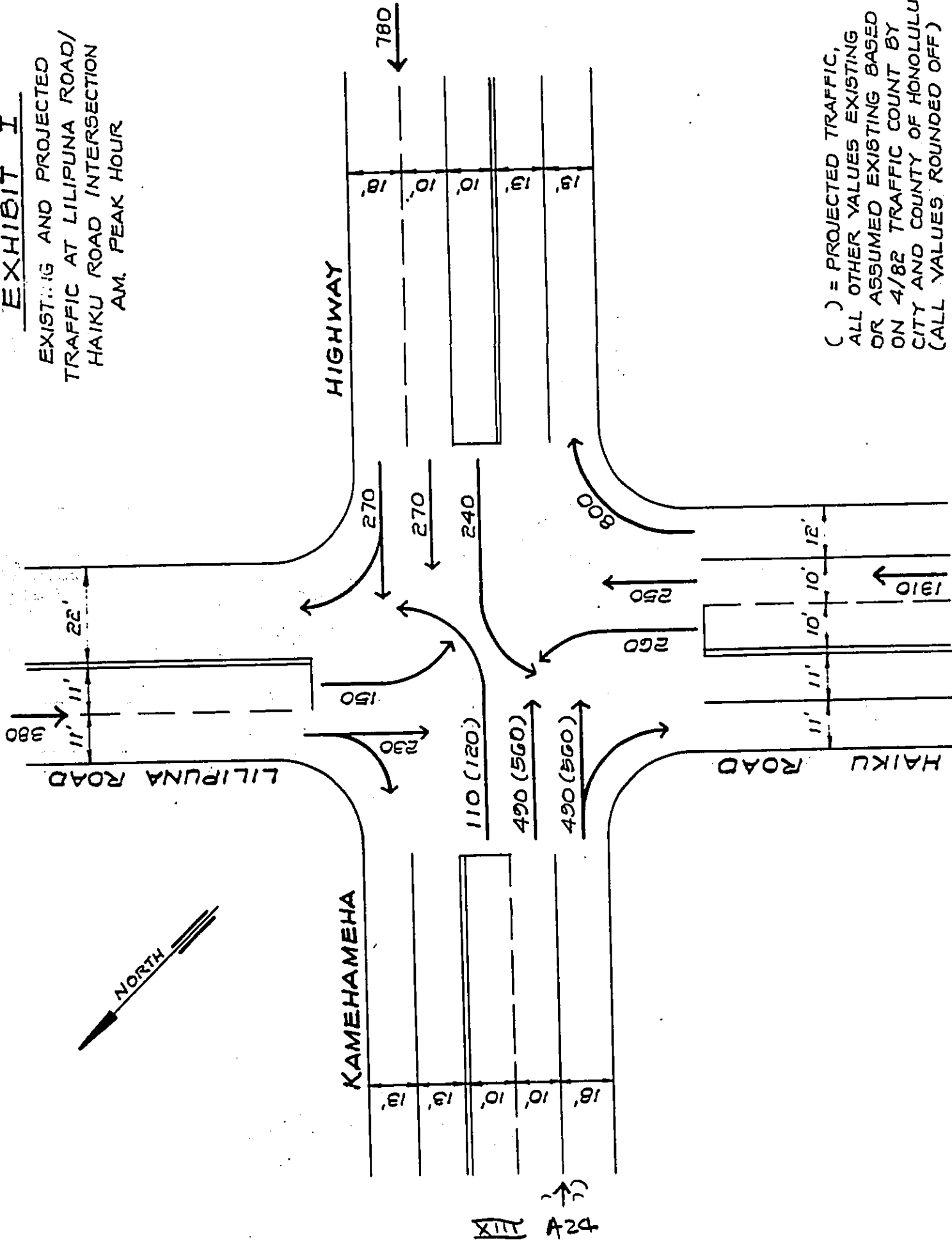
Enclosures

1032

XIII A24

EXHIBIT I

EXISTING AND PROJECTED
TRAFFIC AT LILIPUNA ROAD/
HAIKU ROAD INTERSECTION
AM. PEAK HOUR

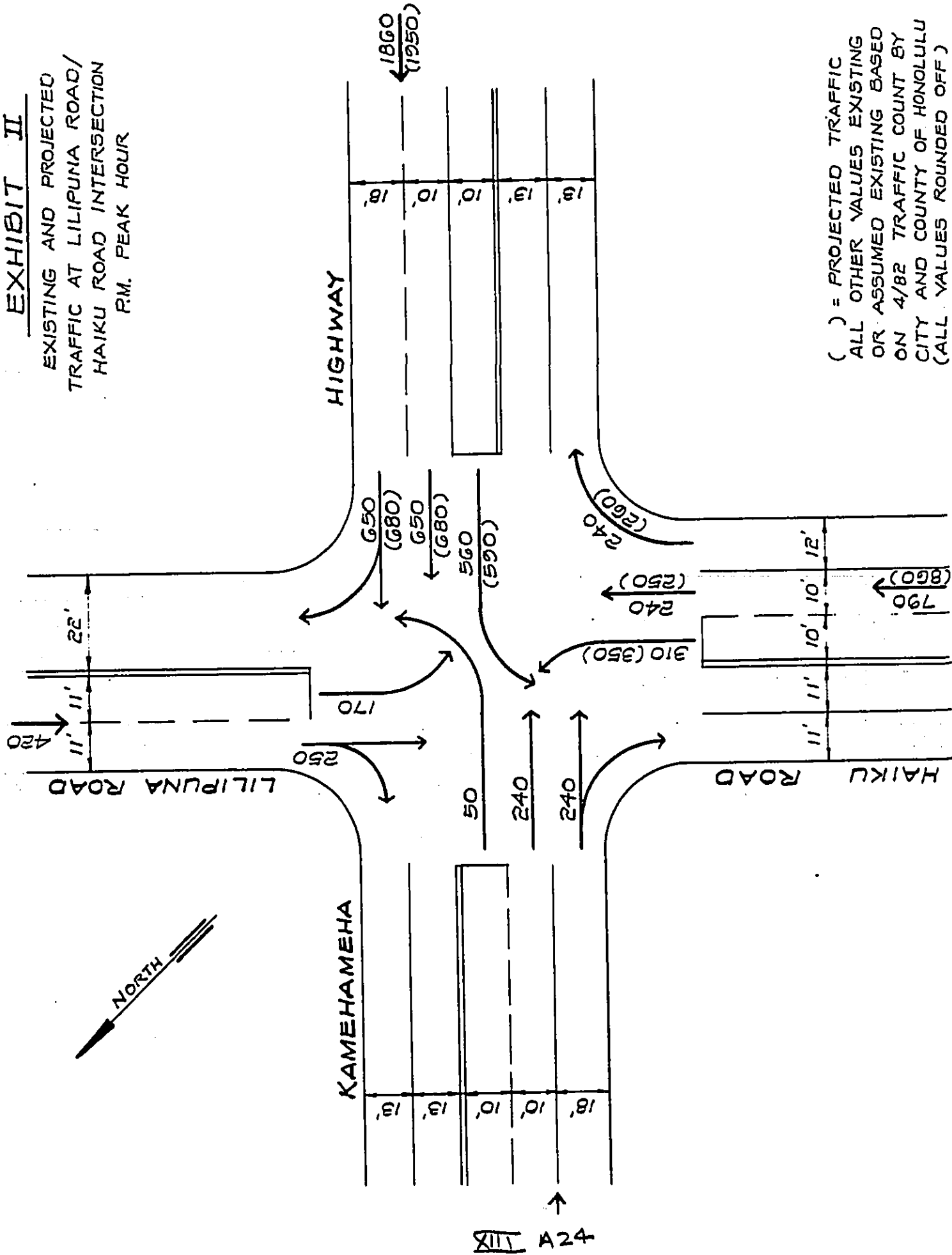


() = PROJECTED TRAFFIC,
ALL OTHER VALUES EXISTING
OR ASSUMED EXISTING BASED
ON 4/82 TRAFFIC COUNT BY
CITY AND COUNTY OF HONOLULU
(ALL VALUES ROUNDED OFF)

XIII A24

EXHIBIT II

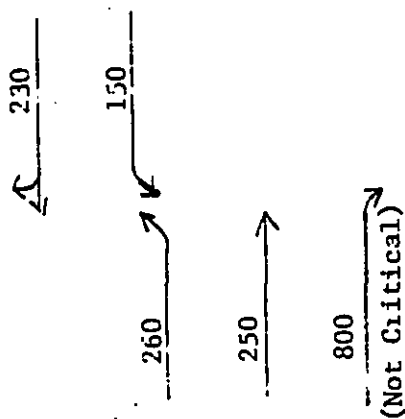
EXISTING AND PROJECTED
TRAFFIC AT LILIPUNA ROAD/
HAIKU ROAD INTERSECTION
P.M. PEAK HOUR



CRITICAL LANE MOVEMENT CALCULATIONS

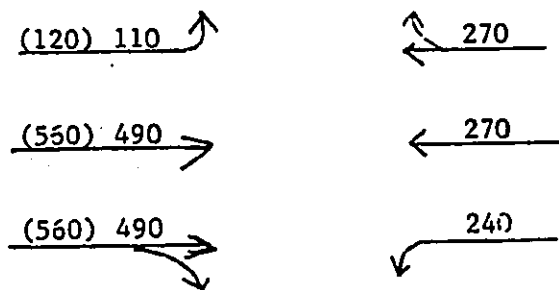
A.M. Critical Lane Volume - Lilipuna/Haiku

2 Phase Operation



$260 + 230 = 490$ ∴ Use
 is greater than
 $250 + 150 = 400$

A.M. Critical Lane Volume - Kamehameha Highway



$560 + 240 = 800$ ∴ Use
 is greater than
 $270 + 120 = 390$

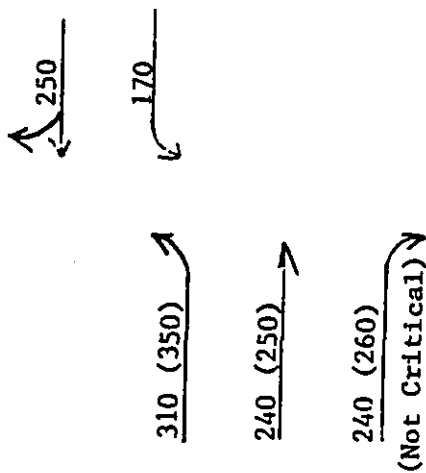
∴ Project A.M. Critical Lane Volume = $490 + 800 = 1,290$ Vehicles
 Existing Critical Lane Volume = $490 + 730 = 1,220$ Vehicles

$1,290 < 1,500$ Allowable ∴ Okay, but approaching capacity.

() = Projected Volume,
 All others existing or assumed existing conditions

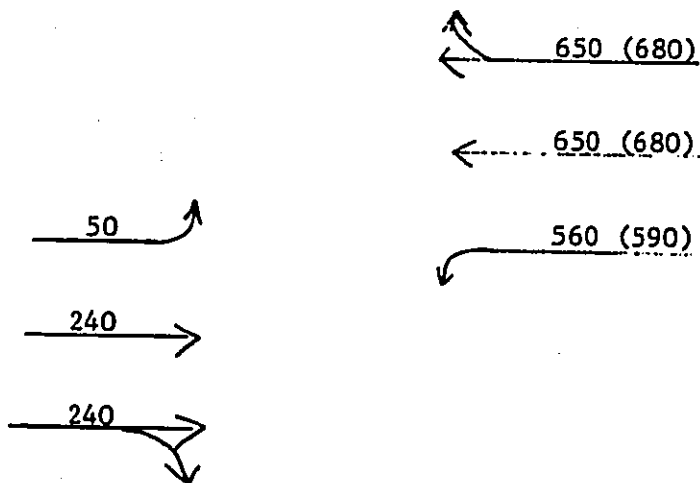
P.M. Critical Lane Volume - Lilipuna/Haiku

2 Phase Operation



$350 + 250 = 600$ ∴ Use
is greater than
 $250 + 170 = 420$

P.M. Critical Lane Volume - Kamehameha Highway



$590 + 240 = 830$ ∴ Use
is greater than
 $680 + 50 = 730$

∴ Project P.M. Critical Lane Volume = $600 + 830 = 1,430$ Vehicles
Existing Critical Lane Volume = $560 + 800 = 1,360$ Vehicles

$1,430 < 1,500$ Allowable ∴ Below but close to recommended maximum.

() = Project Volume,
All others existing or assumed existing conditions

GRAY, HONG & ASSOCIATES

March 7, 1983

TE 2/83-511

MEMORANDUM

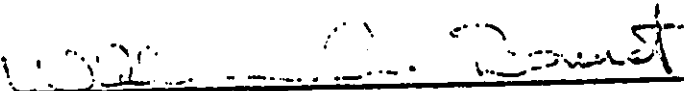
TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: WILLIAM A. BONNET, DIRECTOR

SUBJECT: REVIEW OF DRAFT ENVIRONMENTAL IMPACT STUDY
HEEIA KEA SUBDIVISION

We have reviewed the subject Draft Environmental Impact Study and offer the following comments:

1. The peak hour traffic assignments, as shown in figures 15 and 16, anticipate that the bulk of the traffic from this development will be heading or coming away from the direction of the Kamehameha Highway/Haiku Road intersection. We agree that this would be the logical route, and as such, had recommended in our initial response that a capacity analysis of this intersection be included in the Environmental Impact Study. This was not provided.
2. Figures 15 and 16 also detail proposed plans to improve Kamehameha Highway at the two intersections. We recommend that acceleration and deceleration lanes be lengthened to provide a safe ingress and egress from this subdivision.
3. The statement in the Mass Transit Section that reads "The Heeia Kea Subdivision will provide bus stops etc." should be corrected. Bus services for this subdivision will be served only from Kamehameha Highway as interior circulation is not feasible.


WILLIAM A. BONNET

cc: Gray, Hong & Associates
Hawaiian Electric Company

XIII B24

XIV. SUMMARY OF UNRESOLVED ISSUES

1. No commitment of potable water availability has been made for the project. However, this is not unusual based on the fact that the Board of Water Supply will not issue any commitment until plans have been submitted and approved. In addition, a water master plan must be prepared and submitted to the Board of Water Supply.
2. The method in which sewage will be handled has been described in principle in this document. However, the specific details regarding construction have not been completed. This issue will be resolved when construction plans detailing connection to the City and County system have been prepared and approved. In principle, connection to the City and County system will follow the City's facilities plan.
3. The extent of additional and appropriate archaeological work that should be undertaken remains to be determined. Some concern centers around the potential for subsurface information. Additional work is proposed in conjunction with the Department of Land & Natural Resources to address that concern. The scope of this work will be coordinated with DLNR.
4. Protection of Kaneohe Bay during construction will be provided through use of erosion control measures. In principle, the measures proposed are use of sediment traps, sediment berms and ponds as necessary. An erosion control plan for the project must be designed and approved by the City prior to construction.

RECEIVED
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DENVER, COLORADO



APPENDIX A

ENVIRONMENTAL IMPACT STATEMENT

PREPARATION NOTICE

HEEIA KEA RESIDENTIAL SUBDIVISION

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

APPROVING AUTHORITY : City and County of Honolulu
City Council

REVIEWING AGENCY : City and County of Honolulu
Department of Land Utilization

APPLICANT : Hawaiian Electric Company, Inc.,
(Cowell & Company, Project Management)

AGENT : Gray, Hong & Associates, Inc.

PROJECT LOCATION : Heeia Kea mauka of Kamehameha Highway near the Heeia
Kea Small Boat Harbor, Heeia, Koolaupoko District,
Island of Oahu, State of Hawaii.

TAX MAP KEYS : 4-6-06: 1, 2, 4, 7 through 16 and 22 through 51
4-6-16: 32

REQUEST : Special Management Area Use Permit (SMP)
Shoreline Setback Variance (SSV) (If required)

I. PROPOSED ACTION

Hawaiian Electric Company, Inc., under a lease and agreement-of-sale with Kamehameha Schools/Bishop Estate, holds approximately 219.059 acres of land as identified by Tax Map Keys 4-6-06: 1, 2, 4, 7 through 16 and 22 through 51 and 4-6-16: 32. All lands mauka of Kamehameha Highway account for 218.1 acres. Of this 218.1 acres, approximately 102 acres adjacent to Kamehameha Highway are zoned R-6 Residential and the remaining 116.1 acres, located to the rear and mauka are zoned P-1 Preservation.

The applicant, through its project Manager, Cowell & Company, Inc., proposes the following improvements for the property.

<u>ITEM</u>	<u>NUMBER</u>	<u>AREA</u>
R-6 Residential Lots (5,000 sq. ft. minimum)	389	69.2 acres
29-Lots (Existing)	29	14.3 acres
Parksite	1	3.5 acres

Hawaiian Electric Company Base Yard (Existing)	1	2.0 acres
Roadways	12	13.0 acres
Remainder Lot (P-1 Preservation)	<u>1</u>	<u>116.1 acres</u>
TOTAL	433	218.1 acres

The proposed project will also include the onsite construction of a drainage system, water system, sewage collection system and underground electric, telephone and cable systems.

The proposed project site is partly within the Special Management Area. A portion of the proposed drainage improvements which may be necessary would be within the 40-foot Shoreline Setback. A Special Management Permit is required for the proposed improvements. A Shoreline Setback Variance may be required.

A. Technical Characteristics

1. Approximately 2.4 miles (12,500 linear feet) of 56-foot and 44-foot right-of-way roadways constructed to City and County of Honolulu Standards are proposed for access to the project site. Two major intersections (56-foot right-of-way) and one minor intersection (32-foot right-of-way) with Kamehameha Highway are proposed.

The highway is under the jurisdiction of the City and County of Honolulu. Presently, Kamehameha Highway has a 50-foot right-of-way, however, the proposed functional plan indicates a 60-foot right-of-way. Highway improvements will include the creation of two intersections with left turn storage lanes for access into the project site. No highway widening is anticipated.

2. The proposed residential lots and improvements are within a 200 + acre drainage basin consisting of six sub-basins ranging in size from 6 acres to 54 acres.

The storm water runoff from the sub-basins will vary between 50 cfs and 300 cfs. The total storm water runoff from the project is approximately 1000 cfs. A drainage system installed to City and County Standards is proposed to provide adequate drainage.

All drainage will ultimately enter Kaneohe Bay. There are four drainage structures passing under Kamehameha Highway and entering the Bay under existing conditions. These structures will be analyzed to determine adequacy. If necessary, additional drainage structure(s) will be constructed.

3. A water supply system constructed to Board of Water Supply Standards is proposed. The system will consist of transmission main, fire hydrants and service laterals. The project's water system will connect to the existing 272' Punaluu System within Kamehameha Highway. All proposed lots are below the 170 foot

elevation, thus, the Punaluu System will provide adequate pressure and no on-site storage reservoir is proposed. Adequate water supply is presently available from the Punaluu System, however, a determination of water availability/commitment will be made by the Board at the time when construction plans are submitted for approval.

4. A gravity sewer system conforming to City and County Standards is proposed for on-site sewage collection. The on-site collection system will discharge sewage to the City and County's master planned sewage collection system for the area. The project site is within the Heeia-North SubArea as indicated on the City and County of Honolulu's Facilities Plan. However, there is no recommendation for immediate action regarding installation of the Heeia-North SubArea sewers. The project is also immediately adjacent to the end of the Kahaluu-East SubArea Facility Plan Sewage System. Contact with the City and County is proposed to determine which system should be considered for sewer connection.
5. Underground electric, telephone and cable service will be provided to each lot as required by Subdivision Rules and Regulations and in accordance with Hawaiian Electric Company, Inc. and Hawaiian Telephone Company requirements. The underground system will be installed within the roadway right-of-ways.
6. Preliminary estimates indicate approximately 40,000 cubic yards of earthwork (embankment and excavation) will be required to establish road grades and acceptable lot slopes. It will be possible to balance earthwork on the site, i.e., excavation will equal the amount of embankment and therefore eliminate the need to import or remove material. The area to be graded has slopes varying from nearly level to 30 percent under existing conditions. After grading is completed, the maximum roadway grade will not exceed 12 percent and all lots will be suitable for house construction.

B. Socio-Economic Characteristics

1. It is a recognized fact that there is a severe shortage of housing units on the Island of Oahu. The proposed project is being planned to fill a portion of this unsatisfied demand. The land proposed for development is suitable for residential housing. In addition, the land proposed for development is zoned R-6 Residential, designated Residential on the Detailed Land Use Map (DLUM) and classified Urban according to State Land Use District Maps. The proposed Koolaupoko Development Plan presently designates portions of this property as Agriculture. However, the Department of General Planning is currently considering Residential Designation of this land.
2. The preliminary construction cost estimate for improvements to support the project (grading, roadways, sewers, utilities and drainage structures) is in the rough range of 6 to 8 million dollars.

3. No determination as to project phasing has yet been made. The total length of time to construct project improvements will be about 2 to 4 years depending upon incremental development.

C. Environmental Characteristics

1. The subject property at its makai boundary, adjacent to Kamehameha Highway is low-lying terrain (elevation 5.0 ± feet) which slopes at an average grade of less than 25% to elevation 100 feet, which approximately represents the urban boundary. Above the urban boundary, the slope increases. The extreme mauka property line is also the ridge line and is generally at an elevation varying between 500 and 600 feet. The site is essentially vacant with the exception of the Hawaiian Electric Company Base Yard. Some of the existing house lots along Kamehameha Highway are improved with substandard structures. Most of these lots will remain. A few of these lots will be consolidated and resubdivided to permit access for the proposed project.
2. Drainage from the proposed development presently enters Kaneohe Bay via three box culverts and one pipe culvert crossing under Kamehameha Highway. The existing culverts will be analyzed to determine adequacy. Should the existing structures be inadequate, additional structures will be constructed. The proposed project will enhance the drainage of the existing low-lying lots.

Due to the terrain of the drainage basin, runoff enters Kaneohe Bay at a relatively rapid rate. Residential development will increase the amount of runoff entering the Bay by approximately 15 to 20 percent. Runoff will have an impact which will be analyzed to determine the effects on property as well as on Kaneohe Bay water quality.

3. The project area is not sewered. However, the property is adjacent to the Kahaluu-East SubArea and is within the Heeia-North SubArea of the City and County's Facilities Plans for sewage collection. As previously stated, the City and County of Honolulu will be consulted to determine the appropriate sewer system for connection. The City and County's Facilities Plans presently indicate no immediate action is planned for the Heeia-North SubArea.
4. The average daily traffic counts for the stretch of Kamehameha Highway fronting the project have not exceeded 3,000 and 2,400 vehicles per day in northbound and southbound directions, respectively, since the completion of Kahekili Highway in 1972. The existing peak hourly traffic for Kamehameha Highway has not exceeded 600 vehicles over the same period.

The proposed subdivision will add approximately 3,000 vehicle trips to the existing average daily traffic flow and approximately 300 vehicles to existing peak hourly traffic.

Additional traffic will have an impact on air quality, noise and water quality that will be analyzed and incorporated into the EIS.

5. Preliminary reconnaissance with respect to flora and fauna indicated that there were no significant or endangered species existing on the site. More detailed analysis will be conducted and incorporated into the EIS.
6. Preliminary archaeological review indicates no previous archaeological work has been documented on this property. Additional literature review and field work will be completed and incorporated into the EIS.

II. AFFECTED ENVIRONMENT

The proposed Heeia Kea project site is bounded by Kamehameha Highway at its makai boundary and extends between 1,200 and 2,000 feet mauka covering an area of approximately 102 acres. The area is essentially vacant with the exception of the Hawaiian Electric Base Yard and the existing house lots located along the highway and previously discussed.

Residential development exists approximately one-half mile to the south and one-quarter mile to the northeast.

The project site is zoned R-6 Residential. The existing Detailed Land Use Map (DLUM) designates the area proposed for development as Residential.

A. Major Impacts to the Special Management Area and Shoreline Setback Variance

The potential environmental impacts, as related to the significance criteria prescribed by Hawaii Revised Statutes Chapter 343 and City and County Ordinance Nos. 4529 and 77-100, are briefly identified in the following items. These and other impacts as related to the proposed action and preceding characteristics previously described will be thoroughly addressed in the final EIS document.

1. The proposed project may create physical impacts to the site and its surrounding during construction and after the project has been completed. The project site is adjacent to Kaneohe Bay which is classified as Class AA waters by the State of Hawaii, Department of Health.
2. The impact of land alteration from its basically vacant condition to a 433-lot subdivision (including existing lots) with roadways, utilities, drainage system sewer system and landscaping must be analyzed.
3. The impact on sewage collection and disposal must be analyzed.
4. The impact on traffic must be analyzed together with the related impacts on noise, air and water quality.
5. The impact on drainage must be identified.

6. Work necessary to determine the extent of impacts on flora and fauna must be conducted and discussed.
7. Archaeological/historical work will be conducted to identify any impacts.

B. Mitigation Measures

The project must adhere to all applicable City and County of Honolulu and State of Hawaii Regulations which would govern the construction and operation of the proposed project.

The Environmental Impact Statement must discuss and determine the extent of all impacts as well as methods to mitigate identified impacts.

III. POLICIES AND GUIDELINES TO BE DISCUSSED IN THE EIS

As previously stated, the project is partly within the Special Management Area, and a portion of the drainage improvements may be within the 40-foot Shoreline Setback. The project, therefore, requires a Special Management Area Use Permit (SMP) and Shoreline Setback Variance (SSV) prior to construction. The SSV will not be required if no construction is required in the 40-foot shoreline setback. In compliance with the City and County of Honolulu, Department of Land Utilization requirements and the Hawaii Revised Statutes Chapter 343, an accepted Environment Impact Statement which addresses the significance of the proposed project within the Special Management Area and Shoreline Setback will be submitted concurrently with the SMA and SSV applications.

IV. SUGGESTED AGENCIES TO BE CONSULTED IN PREPARATION OF EIS

City and County of Honolulu

Building Department
Honolulu Fire Department
Department of General Planning
Department of Parks and Recreation
Board of Water Supply
Police Department
Department of Public Works
Department of Transportation Services
Department of Land Utilization
Department of Housing and Community Development

State of Hawaii

Department of Education
Department of Transportation
Department of Planning and Economic Development
Department of Land and Natural Resources
Department of Health

Office of Environmental Quality Control
Department of Agriculture
Department of Hawaiian Home Lands
Department of Social Services and Housing, Hawaii Housing Authority

University of Hawaii

Environmental Center
Water Resources Research Center

Federal

U.S. Army Corps of Engineers
U.S. Fish & Wildlife Service
U.S. Department of Agriculture, Soil Conservation Service

Community Organizations

Citizens Against Noise
Life of the Land
Kaneohe Outdoor Circle
American Lung Association of Hawaii
Kahaluu Neighborhood Board No. 29
Kaneohe Neighborhood Board No. 30
Kaneohe Community Council
Kaneohe Business Group
Kaneohe Bay Community Association
Hui Malama Aina O'Koolau
Key Project
Sierra Club
Heeia Kea Community Association

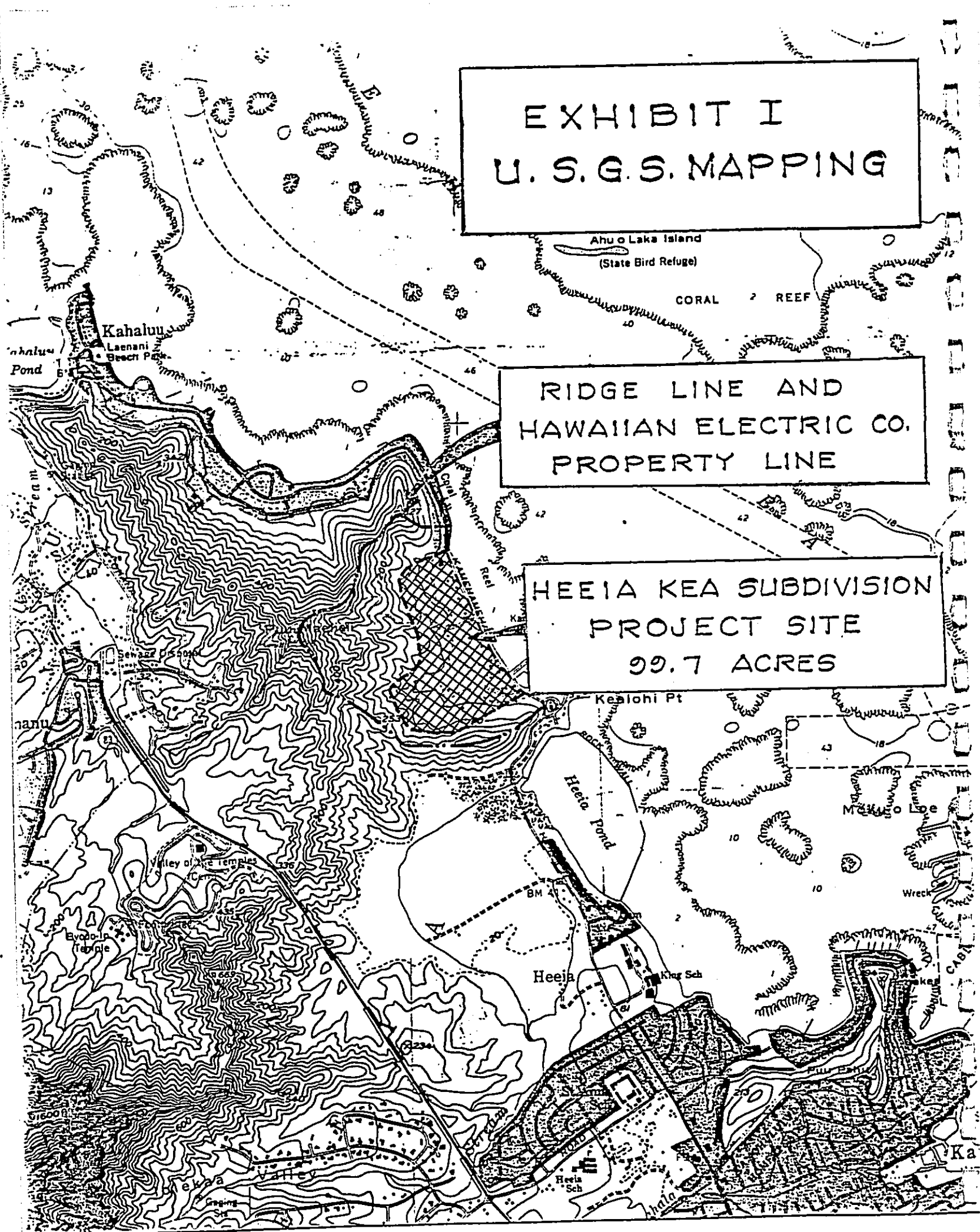
State Libraries

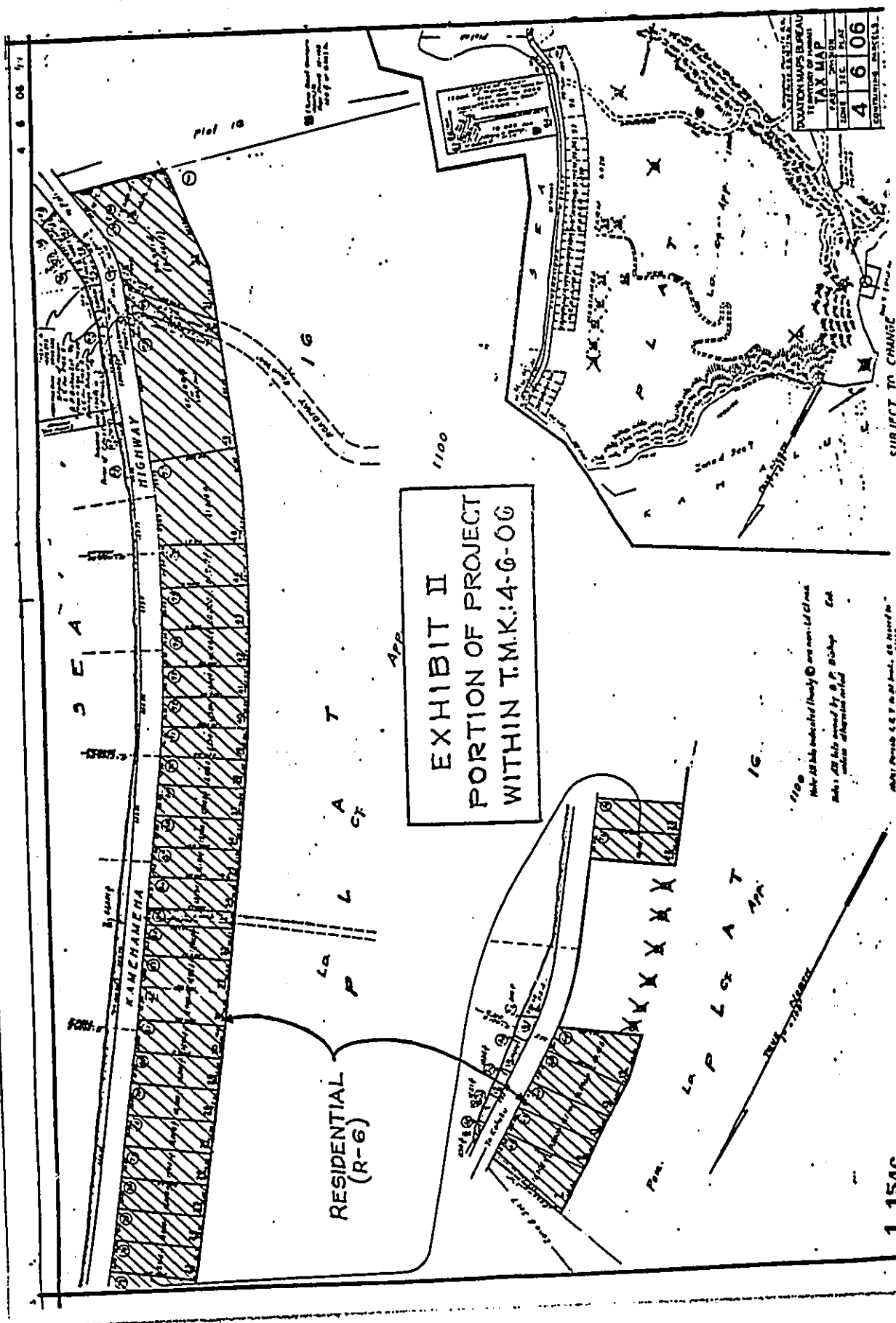
State Main Branch
Kaneohe Regional Library

EXHIBIT I
U. S. G. S. MAPPING

RIDGE LINE AND
HAWAIIAN ELECTRIC CO.
PROPERTY LINE

HEEIA KEA SUBDIVISION
PROJECT SITE
99.7 ACRES

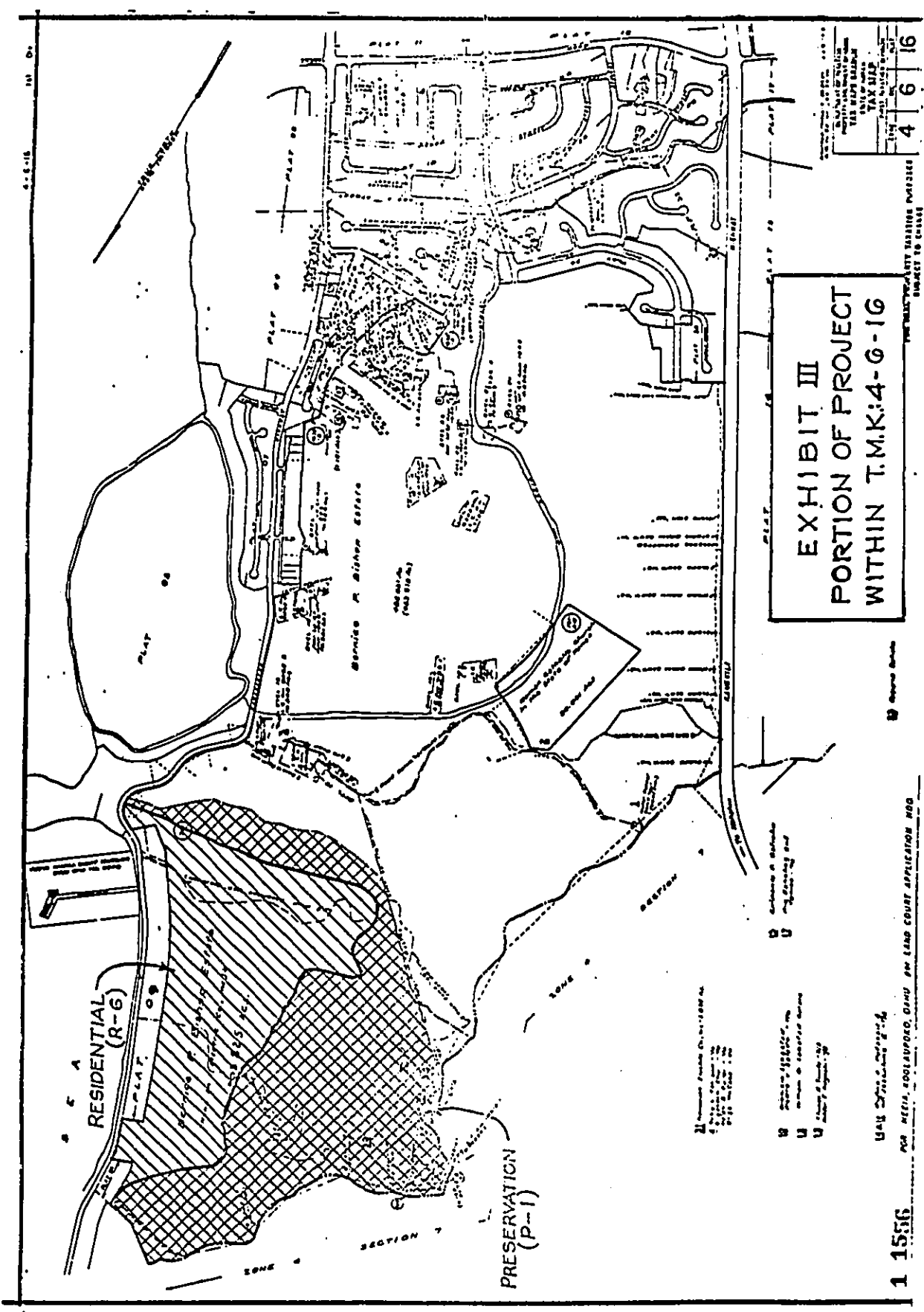




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 POR. HEZIA, KOOLAUPOKO, OAHU

1100
 Not to be used for any other purpose
 This map is prepared by S.P. [unintelligible] Co.
 under license from the State of Hawaii
 Date: 10/10/06

STATE OF HAWAII
TAX MAP
T.M.K.: 4-G-06
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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

EXHIBIT IV

PROPOSED
HEEIA KEA SUBDIVISION

TAX MAP KEY: 4-6-16:82
AT HEEIA, KOOLAUPOKO, OAHU, HAWAII

	NO.	AREA
PROPOSED LOTS (MIN. 5000 ^{sq} ft)	589	69.2 ACS.
EXISTING LOTS (MIN. 19,000 ^{sq} ft)	25	14.9 ACS.
PARKSITE	1	3.5 ACS.
HAWAIIAN ELECTRIC COMPANY	1	2.0 ACS.
ROADWAYS	12	15.0 ACS.
REMAINDER LOT (P-1 PREZ.)	1	116.1 ACS.
TOTAL	439	218.1 ACS.

Prepared by: Gray, Hong & Associates
Consulting Engineers
116 S. King St., Honolulu

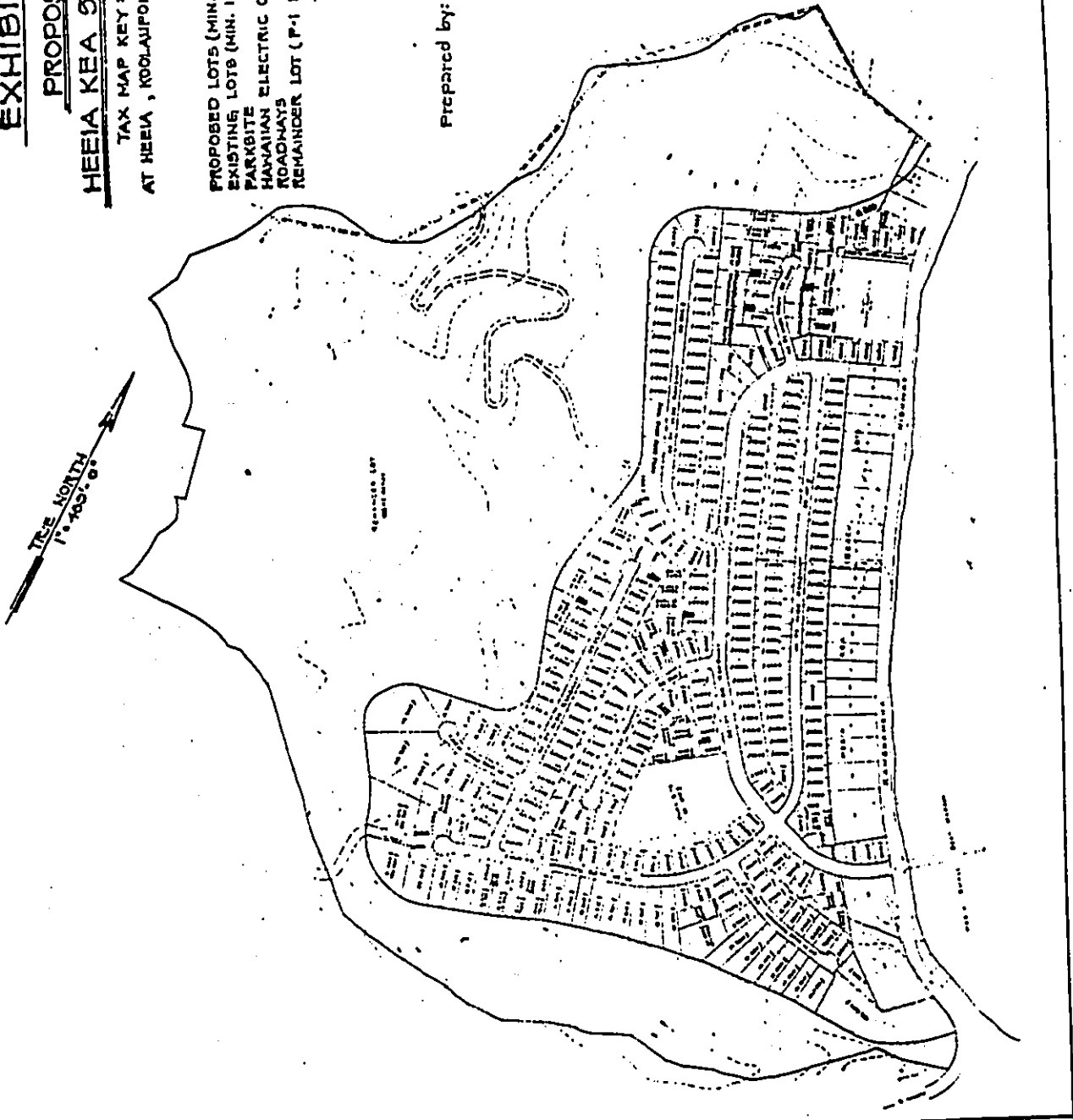
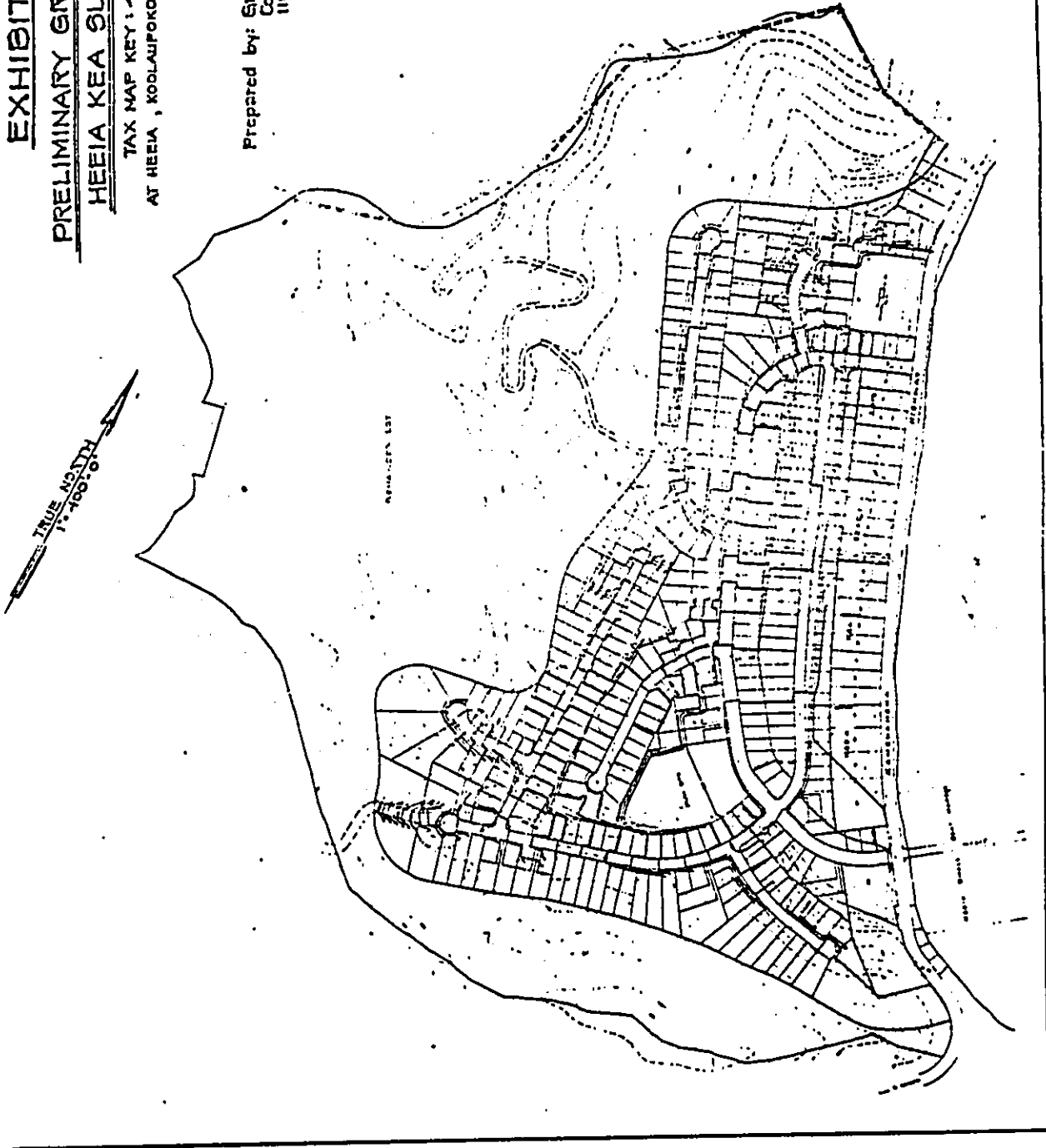


EXHIBIT V
PRELIMINARY GRADING PLAN
HEEIA KEA SUBDIVISION

TAX MAP KEY: 4-G-16:92
AT HEEIA, KOOLAUPOKO, OAHU, HAWAII

Prepared by: Gray, Hong & Associates
Consulting Engineers
116 S. King St., Rm. 508



116 S. King St., Rm. 508

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APPENDIX B

MARKET STUDY - HOUSING DEMAND

COWELL & CO., INC.
REAL ESTATE CONSULTANTS
1414 Hawaii Building 745 Fort Street
Honolulu, Hawaii 96813-3874
(808) 524-5490 or 536-4988

Don R. Cowell, MAI, CRE
Irmgard G. Patterson, MAI
William J. Dornbush, MAI

January 7, 1983

Gray, Hong & Associates, Inc.
116 South King Street, Room 508
Honolulu, Hawaii 96813

Attention: Brian L. Gray, P.E.

Gentlemen:

**Subject: Preliminary Market Study Covering Demand for Housing
with Respect to Proposed Heeia Kea Residential Project**

In response to your request, we have completed a preliminary market study covering residential development on the Island of Oahu and focusing on residential subdivisions in the Koolaupoko District. The purpose of the study has been to determine whether there will be adequate demand for new residential units at the Heeia Kea location. The function of the report is to serve as a portion of the Environmental Impact Statement.

Hawaiian Electric Company, Inc., under a lease and agreement of sale, controls about 219 acres of land at Heeia Kea, Koolaupoko District, Island of Oahu. Approximately 102 acres of this land are presently classified Urban by the State Land Use Commission and zoned R-6, Residential, by the City and County of Honolulu. Hawaiian Electric Company, Inc. desires to utilize this land under its existing zoning and has retained consultants to prepare a preliminary residential subdivision plan for these lands. Details regarding the proposed project are contained in the body of this study. The proposed subdivision plan includes 389 new residential lots and the retention of 29 existing residential lots for a total of 418 residential lots.

Based upon the investigations and analyses conducted, it is evident that there is a strong demand for new single-family housing on Oahu and in the Koolaupoko District. One of the major reasons for the high cost of housing on Oahu is the scarcity of residential zoned land available for development that limits the number of available vacant lots for sale or lease in the market place. It is a basic economic principle that when there is a high demand and a small supply that prices rise significantly above levels that would prevail provided that supply and demand were in balance.

The subject site enjoys an excellent location in close proximity to Kaneohe town. The upward sloping topography of Heeia Kea Valley will offer excellent views to Kaneohe Bay and the ocean from potential residential units developed on the property. It is our opinion that the convenient location of the site and its ocean-oriented setting will make this site one of the most desirable residential projects available for development within the Koolaupoko District during the coming years. As discussed in the body of this report, we believe that

Gray, Hong & Associates, Inc.
January 7, 1983
Page 2

there will be good to excellent demand for single-family residential lots and/or housing units developed within the Heeia Kea project. Further details regarding our market studies and investigations are contained on following pages of this report.

This study is subject to the limiting conditions and assumptions set forth in the study. If you have any questions regarding this study and/or our conclusions, we would be pleased to meet with you and discuss our findings in further detail.

Sincerely,

COWELL & CO., INC.



William J. Dornbush
Vice President

cc: Hawaiian Electric Company, Inc.

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ADDENDA

Exhibit 1 - "Hawaii's Unaffordable Housing"
Exhibit 2 - "New Home Sales Spur Construction"
Exhibit 3 - "A Shrinking Inventory"
Qualifications of William J. Dornbush

I. INTRODUCTION

A. Purpose of Study

Hawaiian Electric Company, Inc., under a lease and agreement of sale, controls about 219 acres of land at Heeia Kea, Koolaupoko District, Island of Oahu. Approximately 102 acres of this land are presently classified Urban by the State Land Use Commission and zoned R-6, Residential by the City and County of Honolulu. Hawaiian Electric Company, Inc. acquired this land in 1964 in order to construct a steam-powered generating plant. However, subsequent to that time, the waters of Kaneohe Bay were classified AA and construction of a power plant is now precluded at this location. Hawaiian Electric Company, Inc. desires to utilize this land under its existing zoning and has retained consultants to prepare a preliminary residential subdivision plan for these lands.

Gray, Hong & Associates, Inc., Consulting Engineers, Honolulu, Hawaii, is now in the process of preparing an Environmental Impact Statement covering the proposed residential project. Cowell & Co., Inc. has been requested to complete a preliminary market study covering residential development on the Island of Oahu and focusing on residential subdivisions in the Koolaupoko District. The purpose of the study has been to determine if there will be adequate demand for new residential units at the Heeia Kea location. The function of the report is to serve as a portion of the Environmental Impact Statement.

B. Summary of Project Site and Proposed Development

A map locating the subject site is shown on the following page. The site is identified by Hawaii State tax maps as Tax Map Key 4-6-16-32, containing about 204 acres, and Tax Map Plat 4-6-06: Parcels 1, 2, 4, 7-16 and 22-51, containing about 15 acres. Tax Map Plat 4-6-06 contains 31 existing residential lots located along the mauka side of Kamehameha Highway, as well as a few smaller parcels situated on the makai side of the highway. Most of the existing residential lots will be retained under the proposed subdivision plan. The proposed subdivision plan includes 389 new residential lots and the retention of 29 existing residential lots for a total of 418 residential lots. It is noted again that all of the land within the proposed subdivision is presently zoned R-6, Residential and no zoning changes are being requested for the proposed project.

Topography of the lands within the Urban designation range from fairly level to gently sloping, with rear portions moderately sloping. Elevation of the property ranges from about 10 to 25 feet above sea level along the mauka side of Kamehameha Highway to about 75 to 150 feet above sea level at the rear of the planned residential development. This upward sloping topography in Heeia Kea Valley will offer excellent views to Kaneohe Bay and the ocean from potential residential units developed on the property. Further details regarding the subject property and the proposed project will be contained in the Environmental Impact Statement.

C. Overview and Conclusions

In completing this preliminary market study, we have reviewed numerous studies prepared for State and County agencies. Pertinent recurring findings revealed by these studies are briefly summarized below:

- 1) Home ownership is an important expectation among Hawaii's residents.
- 2) There is an overwhelming preference for fee simple, detached single-family homes.
- 3) Over the years, the demand for new single-family homes has far outpaced the supply throughout the State of Hawaii. Some studies estimate that the shortage of single-family residential units in the State is about 60,000 units.
- 4) It is anticipated that demand for affordable single-family housing will continue to outpace supply unless major changes in the economy, government and housing industry occur.
- 5) The scarcity of raw residential land available for development is a major contributing factor to the housing supply/demand problem and, consequently, the high cost of housing throughout the State.

Market investigations and analyses indicate that the number of single-family residential units developed during recent years on Oahu has declined significantly from previous levels during the late 1960s and early 1970s. For instance, within subdivisions containing 25 units or more, only 354 residential units were sold during 1981 compared to almost 3,500 residential units sold in 1971. We believe this significant decline is the result of the following major factors:

- 1) Residential units on Oahu are priced above levels that most families can afford.
- 2) High interest rates during 1980 and 1981 precluded many buyers from qualifying to purchase residential units.
- 3) The availability of Residential-zoned land on Oahu that has adequate infrastructure for development has declined over the last two decades and created a severe scarcity of desirable residential sites that can be readily developed.
- 4) The amount of governmental approvals required for a major residential project have increased significantly during recent years. For instance, the State enacted shoreline management legislation in 1975 and the Counties are now responsible for processing Special Management Area Permits for lands located in proximity to shoreline areas. Further, the City and County of Honolulu has been in the process of preparing Development Plans for eight planning districts during the past several years. Only two districts, the Primary Urban Center and the Ewa District (Secondary Urban Center), had Development Plans adopted in late 1981. Although the Ewa area has significant lands planned for residential development, the area lacks adequate infrastructure at this time to permit extensive development during the next few years. The Primary Urban Center has adequate infrastructure for additional development, however, there are very few major undeveloped residential areas within the PUC available for single-family development.

Several new major residential projects are currently being developed in Central Oahu and portions of the Ewa Plain. Major projects include Mililani Town, Gentry Waipio and Village Park, located mauka of the H-1 Freeway near Kunia Road. Further details regarding these projects are contained elsewhere in this study.

Our research and analysis indicate that adequate supplies of residential housing can be made available in Central Oahu and portions of the Ewa area. However, although a significant portion of Oahu's market has desire to purchase residential units in the Koolaupoko District, the supply of land planned for residential use in this area is likely to decrease significantly if the proposed Koolaupoko District Development Plan is passed in its current form.

According to information contained in the "Development Plan Land Use Analysis" prepared by the Department of General Planning, City and County of Honolulu, in April 1980, almost 8,500 acres of land on Oahu that are currently zoned Residential were planned to be down designated to Agricultural or Preservation. Within the Koolaupoko District, over 3,200 acres of Residential-zoned land were scheduled for down designation to Agricultural and/or Preservation. The 3,200 acres of Residential zoned land scheduled for down designation in the Koolaupoko District represent about 38 percent of the acreage on Oahu zoned Residential that was scheduled for down designation. Assuming that the proposed Koolaupoko District Development Plan passes in a form close to its present form, there will be very few desirable residential sites containing significant land areas for major developments that can be readily developed during the coming years in the Koolaupoko District.

The Research Division of First Hawaiian Bank contained an excellent article entitled "Hawaii's Unaffordable Housing" in its "Economic Indicators" monthly report issued December 1982. Four major reasons attributed to the high cost of housing were "(1) developers bear the full costs of roads, curbs, sewers, etc., whereas in many Mainland locations the government provides these facilities and spreads the cost among all the taxpayers, (2) the price of cement, a large factor in site preparation, is higher here, (3) much of our residential land is hilly and difficult to develop, as most level land is classified agricultural, and (4) regulatory requirements for subdivisions are unnecessarily elaborate. Hence it is the cost of the site that accounts for a great part of Hawaii's higher housing prices."

The article goes on to state, "In 1960 Federal Housing Administration statistics showed the average market price of residential sites in Hawaii at \$6,502, roughly 2.5 times the U.S. average of \$2,492. In 1961 Hawaii became the first state to pass a land use law, in which we seem to take great pride. By 1980, the FHA statistics showed the average Hawaii site price at \$60,048 -- about 5.5 times the U.S. average of \$11,009, and 3 times the \$20,853 average for California, the second most expensive state. Worse yet, the average lot size in Hawaii is 5,901 square feet, compared to the U.S. average of 12,807, which works out to \$10.18 per square foot for Hawaii lots -- 12 times the U.S. average of \$0.86 per square foot. Here we have a classic case of market supply and

demand. Demand is high because Hawaii is a desirable place to live, and supply is short because we have chosen to legislate severe restrictions on land use." The article concludes by stating, "There is no way to have both restrictive land use policies and affordable housing." A copy of this article is contained in Exhibit 1 of the Addenda.

During recent months, interest rates for residential mortgages in the State of Hawaii, as well as throughout the nation, have declined due to the economic slowdown and other reasons. The decline in interest rates and the pent-up demand for more single-family residential units have caused a recent increase in the sales pace for single-family residential units on Oahu. Details and data supporting this statement are contained and discussed elsewhere in this report and Exhibit II of the Addenda.

In summary, we believe that the Heeia Kea site controlled by Hawaiian Electric Company, Inc. represents a very desirable location for residential development to partially satisfy the demand for new single-family housing on Oahu. The site is conveniently located within a short driving distance to Kaneohe town, and the natural topography will offer excellent views to Kaneohe Bay and the ocean. It is our opinion that the convenient location of the site and its ocean-oriented setting make this site a most desirable major Residential-zoned land holding available for development within the Koolaupoko District. Further details regarding our market studies and investigations are contained on following pages of this report.

D. Limiting Conditions and Assumptions

The conduct of any study is necessarily guided by, and its results influenced by, the terms of the assignment and the assumptions forming the basis of the study. The following conditions and assumptions, together with lesser assumptions embodied in the report, constitute the framework of our analysis and conclusions.

1. The opinions and conclusions reached are based upon the present condition of the national economy and the present purchasing power of the dollar. This report expresses the opinion of the signer as of January 7, 1983, and in no way was contingent upon the reporting of specified conclusions. The study assumes that the housing market will continue to strengthen as it has during recent months.
2. Relied Upon Information - This included numerous interviews with local sources such as governmental agencies, financial institutions, Realtors and developers. Information given by these and other sources was weighed in the light in which it was supplied; however, no responsibility is assumed for possible inaccuracies.
3. Possession of this report, or a copy thereof, does not carry with it the right of publication, and the report may not be used by any person or organization except the client without the previous written consent of the consultant, and then only in its entirety.
4. The study does not imply the right to court testimony on the part of the consultant without additional arrangements.
5. Maps - Any maps or plans reproduced and included in this report are intended only for the purpose of showing spatial relationships. They are not measured surveys or measured maps and we are not responsible for cartographic or surveying errors.
6. Disclosure - It should be noted that Cowell & Co., Inc. has been retained by Hawaiian Electric Company, Inc. as a consultant for the proposed residential project at Heeia Kea. However, the opinions and conclusions stated in this study are based upon objective analysis of our research and investigations.

II. SUMMARY OF SINGLE-FAMILY RESIDENTIAL TRENDS, ISLAND OF OAHU

Since 1961, the Bank of Hawaii has conducted an annual survey of new residential construction on Oahu. The survey is designed to reflect trends in size, location and price range of new residential development. The 1981 survey of single-family residential subdivisions of 25 units or more represents approximately half of the total of all authorized single-family units on Oahu. The table below summarizes single-family residential developments on Oahu for the years between 1967 and 1981.

SINGLE-FAMILY RESIDENTIAL DEVELOPMENT
Island of Oahu, 1967-1981

Year	Average Area (Sq. Ft.)		Units Sold	Average Price
	House	Lot		
1967	1,124	6,180	1,699	\$ 31,392
1968	1,242	6,567	2,655	35,307
1969	1,269	6,381	2,482	42,120
1970	1,371	6,224	3,614	41,286
1971	1,247	6,252	3,477	45,673
1972	1,338	6,202	2,546	56,280
1973	1,348	5,627	1,771	63,809
1974	1,601	6,281	700	53,205
1975	1,341	6,281	671	79,046
1976	1,259	6,151	658	77,895
1977	1,261	6,167	1,164	79,266
1978	1,442	5,932	1,566	102,479
1979	1,493	4,753	1,696	114,731
1980	1,291	4,631	813	131,693
1981	1,389	5,698	354	157,026

Note: The above table involves private projects.
Source: Bank of Hawaii, Construction in Hawaii, 1982.

According to the survey, 371 single-family residential units were completed on Oahu last year and 354 units were sold last year. During 1980, 787 single-family residential units were completed and 813 units were sold. During 1981, there were 768 single-family residential units authorized for construction. This is the lowest number on record during the last several years and represents 47 percent of the permits issued in 1980 and 25 percent of the permits issued in 1979.

With respect to location, 270 of the 354 new single-family homes sold on Oahu were located in Central Oahu. Sixty units were sold in the Kaimuki-Koko Head area and only 20 new homes were sold in Windward Oahu.

According to the Honolulu Board of Realtors, the average price of single-family resales was \$187,440. During 1980, the average resale price of a single-family unit was \$167,616 and during 1979 it was \$148,715. Thus, although the market was considerably weaker, the average resale price was significantly above that in previous years.

According to information contained in the MONITOR, Honolulu Real Estate Activity Report, November 22, 1982, the unsold inventory of new single-family units has declined steadily since August 1981. Sales of new single-family units have fluctuated significantly over the last two years, with sales ranging from a low of about 10 to 20 units per month to a high of about 130 units per month.

In comparison to a decline in the unsold inventory of single-family units, the unsold inventory of new condominium projects has increased steadily since January 1981. A comparison of new single-family unit sales and unsold inventory and new condominium sales and unsold inventory is shown on the following page.

A summary of major single-family residential developments on Oahu that were under construction in 1981 or proposed for development in 1982 and 1983 is shown on a following page. As shown on that table, single-family residential units are priced in the typical range of about \$112,000 to \$160,000. The more expensive projects are priced above \$200,000.

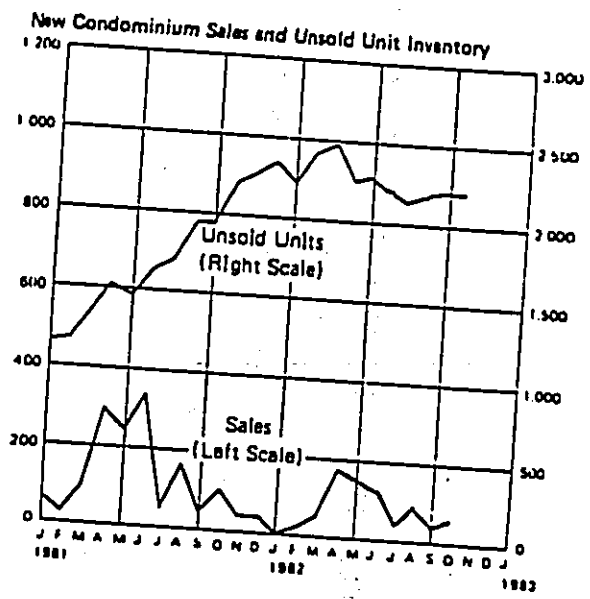
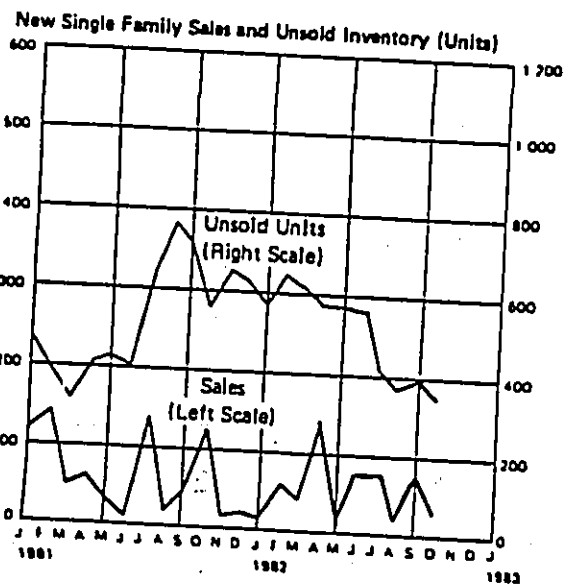
A summary of the housing inventory on Oahu is shown below.

SUMMARY OF HOUSING INVENTORY
Island of Oahu, 1960-1981

As of April 1	All Housing Units	Owner Occupied Units		Renter Occupied Units		
		Land Owned	Land Leased	Private	Federal	State
1960	125,795	35,487	5,985	68,115	N.A.	N.A.
1965	145,732	38,320	11,085	78,479	N.A.	N.A.
1970	174,742	48,263	20,409	86,526	14,400	5,144
1975	223,647	58,576	29,852	113,947	16,280	4,992
1980	252,054	69,147	35,278	123,470	19,290	4,869
1981	254,985	72,078	35,634	122,974	19,286	5,013

Source: Bank of Hawaii and Department of Housing and Community Development, City and County of Honolulu. Data subject to revision.

COMPARISON OF SALES AND UNSOLD IN INVENTORY
 New Single-Family Units Vs. Condominium Units
 Island of Oahu



Source: MONITOR, November 22, 1982.

SINGLE FAMILY RESIDENTIAL DEVELOPMENTS ON OAHU

Project/Developer	Tax Key	Land Ownership	Typical Property House (sq. feet)	Total Completed	Units Sold 1981				Total	Future Units Number	Year	Price Range For Units Sold		
					2 Br.	3 Br.	4 Br.					Min.	Max.	Ave.
KAIMUKI-KOKO HEAD														
MARINA WEST KACOR Development Co.	3-9	Lease	2,000	0	—	13	—	13	—	—	—	187,500	244,000	203,000
KALAMA IKI Kalama Associates	3-9	Lease	1,400	5,000	10	—	—	—	156	1983	—	—	—	—
THE ANCHORAGE Hartford Holdings, Ltd.	3-9	Lease	2,000	8,200	16	—	20	14	34	48	1982	237,000	363,000	281,000
KAMILOIKI ESTATES, PHASE II Chanuta Development Co.	3-9	Lease	1,200- 1,500	—	12	—	13	—	13	6	1982	—	—	155,000
WINDWARD OAHU														
KANEHOE WOODS Lone Star Hawaii, Inc.	4-5	Fee	—	7,000	—	—	—	—	4*	—	—	145,000	160,000	152,500
WOODRIDGE Devex Corp.	4-7	Fee	1,000	3,500	35	—	16	4	20	42	1982	105,000	122,000	112,500
CENTRAL OAHU														
PALEHUA HEIGHTS Finance Realty Co., Ltd.	9-2	Fee	1,350	5,500	0	—	2	3	5	—	—	139,000	145,000	140,850
PALEHUA HEIGHTS II Finance Realty Co., Ltd.	9-2	Fee	1,350	5,500	31	—	18	8	26	45	1982	130,000	169,000	141,895
PUAHI IN WAIPIO Gentry Waipio	9-4	Fee	1,700	5,000	20	—	27	8	35	35	1982	140,000	180,000	160,000
VILLAGE PARK Waitec Development, Inc.	9-4	—	1,250	4,500	40	—	27	7	34	100	1982	107,000	145,000	120,000
MILLIANI Milliam Town, Inc.	9-5	Fee	1,410	6,240	207	18	85	66	170	—	—	115,000	175,000	143,800

Source: Bank of Hawaii, Construction in Hawaii, 1982.

A brief summary of housing vacancy rates for Oahu from 1977 through 1981 is shown below. The survey includes single-family residences and apartments. It is important to note that the vacancy rate for single-family residences is significantly less than that for apartments. This indicates a relatively higher demand for single-family residential units than apartments.

SUMMARY OF HOUSING VACANCY RATES
Island of Oahu, 1977-1981

<u>Date of Survey</u>	<u>Type of Unit</u>	<u>Total Units</u>	<u>Units Vacant</u>	
			<u>Number</u>	<u>Percent</u>
April 1977	Single-Family Residence	113,937	488	0.4
	Apartment	99,913	2,911	2.9
March 1978	Single-Family Residence	117,767	709	0.6
	Apartment	106,467	2,603	2.4
May 1979	Single-Family Residence	116,300	376	0.3
	Apartment	115,766	2,208	1.9
March 1980	Single-Family Residence	116,079	552	0.5
	Apartment	119,817	2,487	2.1
March 1981	Single-Family Residence	122,184	577	0.5
	Apartment	116,201	2,729	2.4

Source: Federal Home Loan Bank of Seattle, Honolulu Housing Vacancy Survey (and Data Book, State of Hawaii, 1981).

Analysis of the foregoing data indicates that there is a severe shortage of single-family residential units on the Island of Oahu. Vacancy rates for single-family units are very low, consistently approximating 0.5 percent of total single-family residential units. The decline in single-family residential development is best evidenced by the data briefly summarized below.

AUTHORIZED HOUSING UNITS
Island of Oahu

<u>Type of Unit</u>	<u>1971</u>	<u>1980</u>	<u>1981</u>
New Single-Family Units	3,771	1,650	768
New Multi-Family Units	4,087	3,411	1,915

In summary, the supply of new single-family residential units being added to the inventory on Oahu has continued to decline over recent years. However, the demand for new single-family units is strong provided that such new units can be constructed in desirable areas at prices that are affordable to residents of Oahu.

III. SUMMARY OF RESIDENTIAL LOT DEVELOPMENT, OAHU

A summary of residential lots approved by the City and County of Honolulu during recent years is shown below.

RESIDENTIAL LOTS APPROVED
Island of Oahu

<u>District</u>	<u>1979</u>	<u>1980</u>
Honolulu	530	686
Koolaupoko	356	190
Koolauloa	336	68
Waialua	137	73
Wahiawa	26	37
Waianae	38	36
Ewa	<u>582</u>	<u>702</u>
Oahu Totals	2,005	1,792

Source: Department of General Planning, City and County of Honolulu (per 1981 State Data Book).

In 1979, the 356 residential lots approved in Koolaupoko reflected about 18 percent of Oahu's total. For 1980, the 190 residential lots approved in Koolaupoko reflected about 11 percent of Oahu's total.

IV. ANALYSIS OF POTENTIAL DEVELOPMENT PLANS
WITH RESPECT TO RESIDENTIAL LANDS

The Department of General Planning, City and County of Honolulu, completed a study in April 1980 entitled, "Development Plan Land Use Analysis". This study inventoried the supply of lands on Oahu under the various existing designations. The report also documented the quantitative aspects of the proposed Development Plans (DPs). The intent of the study was to present the technical basis underlying the nature, magnitude and distribution of the major land uses in the DPs. The "demand" was based upon requirements by the General Plan (GP) adopted by the City Council in January 1977. According to the study, the then 1980 proposed Development Plans would provide the "supply" of land uses to meet the "demand" required by the 1977 General Plan. However, it is our opinion that the demand for various types of lands, particularly residential lands, should be based upon prevailing market factors rather than set guidelines adopted in any General Plan.

It should be noted that Development Plans were adopted in November 1981 for the Primary Urban Center and the Ewa District (Secondary Urban Center). These plans were adopted with modifications subsequent to the proposed Development Plans existing in April 1980. Therefore, there are some differences in land areas presented in the 1980 analysis as compared to the Development Plans for the two districts that were adopted. Further, the Development Plans for the other six districts have not been adopted and have been amended somewhat since 1980. However, in general, we do not believe that the changes in the two adopted Development Plans and the currently proposed Development Plans would change the land areas significantly from those discussed in the April 1980 study.

A significant amount of existing Residential-zoned land on Oahu was proposed on the new Development Plans for down designation to Agricultural and/or Preservation. These findings are summarized briefly below.

As shown on Table B1.5 (Page 114), the Koolaupoko District included a total land area of approximately 40,854 acres. Of this total, about 19,374 acres were zoned for Preservation, 8,665 acres were zoned for Agriculture and about 12,008 acres were zoned for Residential. However, the then proposed Koolaupoko District Development Plan proposed that about 1,822 acres of Residential-zoned land would be classified as Agriculture and about 1,383 acres of Residential-zoned land would be classified for Preservation. Thus, a total of 3,205 acres of Residential-zoned land were scheduled for down designation to Agricultural and/or Preservation. It should be noted that less than one acre of Agricultural-zoned land was scheduled for upgrading to single-family residential use on the proposed Development Plan and that only 5 acres of Preservation-zoned land was scheduled for upgrading to single-family residential use.

As shown on Table B1.9 (Page 118), Oahu contains a total land area of 371,675 acres. Of this total, about 62,991 acres were zoned Residential. However, approximately 4,771 acres of this Residential-zoned land were scheduled for down designation to Agriculture. Another 3,715 acres of Residential-zoned land were scheduled for down designation to Preservation. Thus, 8,486 acres of Residential-zoned land were scheduled for down

designation to Agricultural and/or Preservation. It is noted that about 542 acres of Agricultural land and about 25 acres of Preservation land were scheduled for upgrading to single-family residential use on the proposed Development Plans. Thus, the net decrease in Residential-zoned land due to down designation to Agricultural and/or Preservation was about 7,919 acres.

In summary, approximately 3,200 acres of Residential-zoned land were scheduled for down designation on the proposed Koolaupoko District Development Plan to Agricultural and/or Preservation. This represents about 40 percent of the 7,900 acres (net change) scheduled for down designation on the Island of Oahu.

V. OAHU GENERAL PLAN AND POPULATION PROJECTIONS

A. Oahu General Plan

The revised Oahu General Plan for 1982 was recently adopted by the City Council. According to the General Plan, the subject property located at Heeia Kea, Koolaupoko District, is designated as Urban-Fringe within the Kaneohe-Ahuimanu area. A map showing the population areas of Oahu and their various designations is shown on a following page.

B. Population Projections

The projected population of Oahu for the year 2000 is based upon a figure of 1,039,000 residents. As of 1975, the total Oahu population was 704,403. According to data contained in the adopted General Plan, the Urban-Fringe area of Kaneohe-Ahuimanu had a projected population for the year 2000 of 69,000. This represents 6.6 percent of the total projected population for Oahu in the year 2000. The 1975 population count for the Kaneohe-Ahuimanu area was 51,394, or about 7.3 percent of the total Oahu population.

With respect to the distribution of residential population, the Koolaupoko District is expected to include about 12.4 to 13.6 percent of the total island-wide population in the year 2000. A summary of the various population projections contained in the adopted 1982 General Plan is shown on the following pages.

C. Observations

Federal Judge Samuel King recently ruled that the controversial H-3 Highway program could proceed. Various portions of this major project are scheduled to commence in the near future. Although it will be several years before the total project is completed (provided that the project is allowed to continue to proceed), it is possible that the addition of the new H-3 Highway may increase the demand of residents on Oahu to seek housing opportunities on the Windward side. Thus, although the recently adopted 1982 General Plan may seek to limit growth in certain areas of Oahu, the completion of the H-3 Highway and the desirability of residential living on Winward Oahu may alter the Residential patterns proposed in the recently adopted General Plan.

Distribution of the Residential Population 1975 and 2000

Location	1975 Population	% of Total	2000 Population	% of Total
Oahu Total	704,403	100.0	1,039,000	100.0
Primary Urban Center	398,352	56.5	530,000	51.0
Honolulu (Waialae/ Kahala-Halawa Aiea-Pearl City	304,546 93,806	43.2 13.3	400,000 130,000	38.5 12.5
Secondary Urban Center	21,800	3.1	104,000	10.0
Ewa-Makakilo				
Urban-Fringe	223,890	31.8	322,000	31.0
Aina Koa-Hawaii Kai	39,374	5.6	65,000	6.3
Kailua	40,722	5.8	49,000	4.7
Kaneohe-Ahuimanu	51,394	7.3	69,000	6.6
Waipahu-Crestview	26,913	3.8	48,000	4.6
Mililani-Waipio	20,302	2.9	39,000	3.8
Wahiawa	45,185	6.4	52,000	5.0
Rural	60,361	8.6	83,000	8.0
Waimanalo	8,435	1.2	12,500	1.2
Kahaluu-Kahuku	14,890	2.1	20,000	1.9
North Shore	9,540	1.4	11,500	1.1
Waianae Coast	27,496	3.9	39,000	3.8

NOTE: The '% of total' figures for the year 2000 state the policy contained in the table. The figure of 1,039,000 for the year 2000 and the corresponding distribution of the population to the various designated areas (see map on next page) will be revised as the State Department of Planning and Economic Development revises its population projections.

The '% of total' figures also indicate a mean or average percentage rather than a rigid requirement. A year 2000 percentage which falls within 5% of the indicated mean for an area would be consistent with the Plan's population-distribution policy. For example, as the mean percentage for Ewa is 10.0%, an actual population within a range of 9.5% of Oahu's total population in the year 2000 would be acceptable.

Population figures may be further adjusted to accommodate housing necessary to support the resort industry in the various areas of the Island.

Note: Excerpt from General Plan of City & County of Honolulu, adopted December 1982.

*Population, Objective C, Policy 4, of the 1977 General Plan of the City and County of Honolulu is amended by the addition of a "Population Distribution Table" to read as follows:

DISTRIBUTION OF RESIDENTIAL POPULATION

Location	% of Year 2000 Islandwide Population
Primary Urban Center	47.5 - 52.5%
Ewa	9.0 - 10.0%
Central Oahu	12.8 - 14.2%
East Honolulu	6.2 - 6.8%
Koolaupoko	12.4 - 13.6%
Koolauloa	1.3 - 1.5%
North Shore	1.6 - 1.8%
Waianae	4.2 - 4.6%
	95.0 - 105.0%

Note: Excerpt from General Plan of City & County of Honolulu, adopted December 1982.

Population Areas

Primary Urban Center

1. Honolulu
(Waiialae/Kahala-Halawa)
2. Aiea-Pearl City

Secondary Urban Center

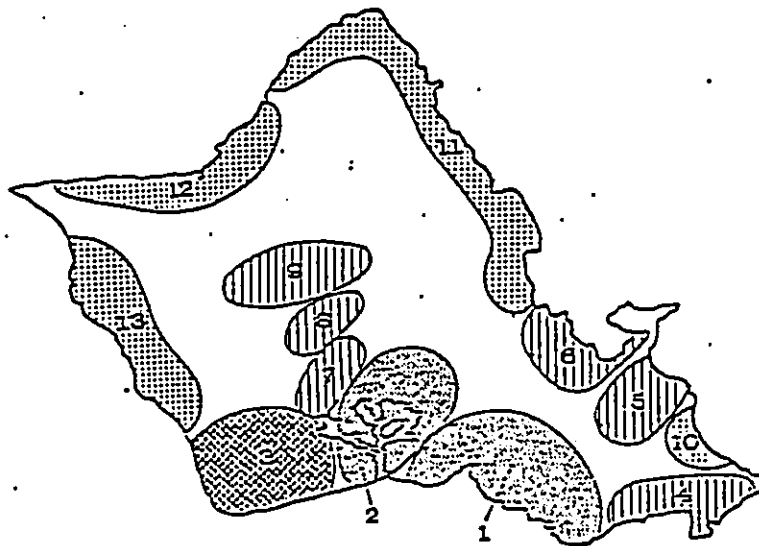
3. Ewa-Makakilo

Urban-Fringe

4. Aina Koa-Hawaii Kai
5. Kailua
6. Kaneohe-Ahuimanu
7. Waipahu-Crestview
8. Mililani-Waipio
9. Wahiawa

Rural

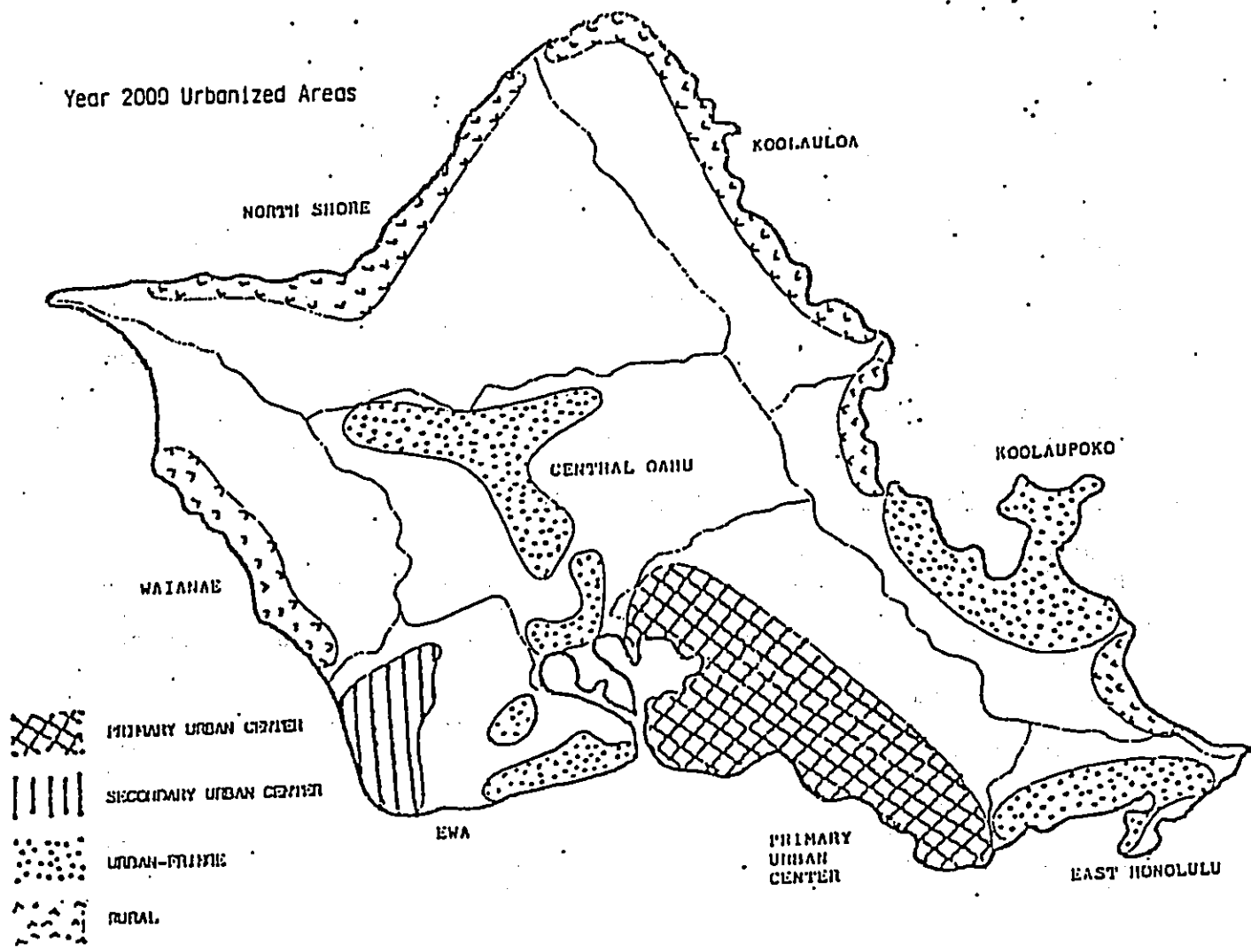
10. Waimanalo
11. Kahaluu-Kahuku
12. North Shore
13. Waianae Coast



Note:

Excerpt from General Plan of City & County of Honolulu, adopted December 1982.

*Population, Objective C, Policy 4, of the 1977 General Plan of the City and County of Honolulu is amended by the addition of a "Year 2000 Urbanized Areas" map to read as follows:



Note: Excerpt from General Plan of City & County of Honolulu, adopted December 1982.

VI. MAJOR SINGLE-FAMILY RESIDENTIAL PROJECTS
PROPOSED OR PLANNED FOR KOOLAUPOKO DISTRICT

In completing this study, we have made investigations in order to determine the location and characteristics of various residential projects that are planned or proposed for the Koolaupoko District. It should be noted that many of these projects involve lands that are scheduled for down zoning on the proposed Koolaupoko District Development Plan and, therefore, may or may not be developed. Further, financing and economic factors may also preclude development of these projects.

A. Lewers & Cooke, Inc. Project, Waihee Road, Kahaluu

Lewers & Cooke, Inc. owns approximately 150 acres of land located at the top of Waihee Road in Kahaluu. Plans showing 333 house lots, typically containing about 6,000 to 11,000 square feet each, have been submitted to the City and County of Honolulu for review. We understand that the first phase of the project would involve approximately 169 lots. All of the land is currently zoned R-6, Residential. However, the lands are presently scheduled to be designated Agricultural on the proposed Koolaupoko District Development Plan. The Department of Land Utilization has indicated that the project does not adequately address sewage treatment, flood risk and other factors. Many residents in the Kahaluu area are opposed to this project. It is not certain at this time whether the project will be developed or modified. The subdivision application has been deferred until April 14, 1983.

B. Castle Estate Lands, Koolaupoko District

Castle Estate owns numerous lands scattered throughout the Koolaupoko District, including lands at Maunawili, Kawainui, Kapaa, Waikalua and other areas. Many of their land holdings are scheduled for down designation from Residential to Agricultural and/or Preservation on the proposed Koolaupoko District Development Plan. Castle Estate has retained Community Planning, Inc. to prepare preliminary planning studies for their various land holdings. Provided that their lands can be retained in Residential zoning, it is possible that the Castle Estate lands could be developed with about 1,500 to 2,500 residential units over an extended time period. However, it is unlikely that many of their land holdings will be developed in the near future, if ever, due to the controversy over various areas including Kawainui Marsh. It is difficult at this time to predict which Castle Estate lands may be developed.

C. Bishop Estate Lands, Heeia

Bishop Estate owns several hundred acres at Heeia, including wetlands and the Heeia bluffs area. The Heeia wetlands are proposed for Agricultural designation on the proposed Koolaupoko District Development Plan. Bishop Estate is making strong efforts to retain about 100 acres at Heeia bluffs to be retained in Residential zoning. Firm development plans for this area are not available at this time.

D. Pulama Gardens, Pulama Road, Kaalaea

Trustees for the THC creditors control several acres of undeveloped land at Kaalaea, along Pulama Road mauka of Kamehameha Highway. Lone Star Hawaii had an option to acquire and develop these lands with about 164 units. However, this option has expired and we understand that Lone Star Hawaii is no longer interested in developing these lands. About 22 acres were zoned PD-H, Planned Development-Housing. One of the limiting factors of developing these lands is the lack of County sewer lines in the Kahaluu area. The development of these lands is uncertain at this time. The PD-H was to expire on December 31, 1982.

E. Kaalaea Subdivision, Kamehameha Highway, Kahaluu

Barbara Odor and Wodehouse Development Company control about 14 acres of land situated along Kamehameha Highway north of Wailehua Road in the Kahaluu area. The land is zoned R-4, Residential, and is presently improved with several substandard housing units. The landowners are presently requesting to develop 60 residential lots on this site. A Special Management Area hearing has been scheduled for late January 1983. Timing for development of this land is uncertain at this time.

F. Ahuimanu Valley Project

Ahuimanu Joint Venture is proposing to develop about 106 residential lots behind the Buddhist Temple in Ahuimanu Valley. Tentative subdivision approval has been extended to June 17, 1983. Phase 3 will contain 60 lots and Phase 4 will contain 46 lots. Construction plans have been approved, subject to Board of Water Supply approval. Construction of Phase 3 is planned to start in the spring of 1983. Various residential projects have been developed in recent years in the Ahuimanu area.

G. Market City Project, Kahaluu

Market City, Limited owns about 15 acres situated at the corner of Kamehameha Highway and Waihee Road. About 7 acres of this land are presently zoned B-2, Business, with the remaining 8 acres zoned Residential. Market City, Limited planned to develop a shopping center on the Business-zoned land and 21 residential lots on the Residential-zoned land. The proposed residential lots ranged in size from about 10,000 to 12,000 square feet. However, a Special Management Area Permit for the proposed project was rejected by the City Council in early 1982, due to the lack of a sewer system in the area and other factors. Development of the proposed residential lots is uncertain at this time.

H. Alexander & Baldwin Project, Kahaluu

Alexander & Baldwin, Inc. owns about 26 acres situated along Kamehameha Highway at the corner of Waihee Road. Approximately 14 acres of this land are presently zoned Industrial, with the remaining 12 acres zoned Residential. Alexander & Baldwin, Inc. proposes to develop 22

industrial lots on the Industrial-zoned land and 24 residential lots on the Residential-zoned land at the rear of the property. A Special Management Area Permit application has been submitted to the County. Timing of the project is uncertain as the project will require an SMA Permit and a U.S. Army Corps of Engineers Permit.

I. Lone Star Hawaii, Kaopa IV Project, Kailua

Lone Star Hawaii owns various land holdings in the Enchanted Lakes area of Kailua. The Kaopa IV project is planned to contain about 409 units. The first increment will include 250 single-family and zero lot line units on about 31 acres of land zoned R-6, Residential. Construction drawings are now being processed for Phase I, to contain 19 lots, and Phase II, to contain 14 lots. The 33 lots in Phases I and II will range in size from 5,000 to 12,100 square feet. Tentative subdivision approval for Phases I and II has been extended to May 12, 1983. Construction of the 33 lots is anticipated to start in the spring of 1983.

J. Summary

Several major potential residential projects have been summarized in the previous paragraphs. As discussed regarding each of those projects, there are numerous uncertainties regarding the development of many of the major projects. Therefore, it is difficult at this time to determine which projects will obtain all necessary development approvals and find adequate financing by the landowners and/or potential developers in order to be successfully developed during the foreseeable future.

VII. REVIEW OF PERTINENT HOUSING STUDIES

Within the last few years, several studies and reports concerning Hawaii's housing problems have been completed by federal, state and county agencies, as well as by organizations representing the private sector. We have reviewed several of these studies and reports. A brief description of major housing studies reviewed is contained in the following paragraphs. Pertinent recurring findings revealed by these studies are briefly summarized below:

- Home ownership is an important expectation among Hawaii's residents.
- There is an overwhelming preference for fee simple, detached single-family homes.
- High housing costs are a major problem for Hawaii's residents.
- The housing market in Hawaii has been characterized by demand for new single-family homes that has far outpaced supply. This, in turn, has been a major contributing factor to extremely high housing costs. According to one study, there currently exists a shortage in the single-family house sector of about 60,000 units.
- It is anticipated that demand for affordable single-family housing will continue to outpace supply unless major changes in the economy, government and housing industry occur.
- The scarcity of raw residential land available for development is a major contributing factor to the housing supply/demand problem and, consequently, the high cost of housing throughout the state.

A. Housing for Hawaii's People (January 1977)

This report was prepared by Daley & Associates in January 1977 for the Hawaii Housing Authority. The report discusses various aspects of supply and demand regarding housing in Hawaii. Selected quotes from the report are noted below.

Concerning a door-to-door survey of Hawaii's residents:

- "Home ownership is an important expectation among most groups in the population." (Page I-8)
- "... cost is the biggest factor in selecting a house for most people." (Page I-8)
- "There was an overwhelming preference among residents for fee simple ownership." (Page I-8)
- "Over 80% of the respondents want a single-family residence; most also want 3 bedrooms and at least 1-1/2 baths." (Page I-8)

"Ages 25-34. The proportion of the population in this age group will expand steadily between 1970 and 1985. Expansion will be at roughly twice the rate of growth of the total population. Thus, a substantial increase in the potential demand for sales housing is forecast." (Page III-8)

"Approximately 81,450 new dwellings will be required statewide from 1975 to 1985." (Page V-1)

"While few will challenge the necessity of controlling the use of Hawaii's limited land resources and protecting the island's beauty, no one knows what long-range effect all this regulation will have on Hawaii's housing industry. Regulation seems to hit the home builder where it hurts him the most, in the pocketbook . . . it is the delays, permit rejections, uncertainty and complicated requirements that increase costs and frustrate developers. And in the long run it is the home buying public that pays this extra cost." (Page IX-1)

B. State Housing Plan (February 1980)

The State Housing Plan is a State Functional Plan prepared in accordance with Chapter 226, Hawaii Revised Statutes, by the Hawaii Housing Authority. The report is dated February 1980 and was recommended to the Hawaii Legislature for adoption as Hawaii's functional plan for housing. Pertinent quotes from this plan are cited below. It is noted that the State Housing Plan was updated in October 1981.

"Hawaii has a number of structural problems in maintaining a sizable inventory of land ready for development, including tightly controlled landownership and competing public policies for land use . . . In order to ensure that the market is able to deliver the number of homes needed in appropriate locations, public policies must ensure that a sufficient supply of serviced land is ready." (Page II-13)

"The state's market for housing has been recently characterized by a tight supply situation in which high owner-occupant and investor demand for units has pushed prices upward to record levels. At the same time, the price picture has not been balanced by expanded supply of new units. Review of supply/demand relationships for the decade of the seventies also clearly indicates that supply has not kept up with demand, at least in terms of homes for residents." (Page III-1)

"Future supply/demand relationships will be influenced by how well the local housing market has met recent supply requirements of population growth. Review of 1970-1978 trends indicates that housing supply has not kept pace with population growth." (Page III-47)

"Hawaii family tastes with regard to housing have not changed markedly in recent years. Almost all families, whether they now own a home or not, desire a single-family detached unit." (Page III-57)

"The availability of residential land has considerable importance in determining land prices." (Page III-103)

"Land availability provides a partial explanation of why the development industry has not kept up with housing demand in the 1978-1979 period." (Page III-105)

C. Housing Assistance Plan (1978-1979)

The Housing Assistance Plan was developed by the City and County Department of Housing and Community Development. Pertinent excerpts from this plan are quoted below.

"The scarcity of available undeveloped or underdeveloped land, the high cost of land and landownership patterns make it very difficult for developers to package new assisted units." (Page 87)

Concerning Hawaii's relatively unique housing conditions:

"There is widespread use of residential leasehold arrangements whereby home owners do not hold title to the land." (Page 76)

"Sugar plantations commonly own and maintain housing for their employees. As the industry declines and the housing stock ages, plantation companies have been unwilling to continue this housing responsibility." (Page 76)

Concerning revised goals for housing assistance programs:

"The revised goals are reasonable, but the City and County may encounter difficulty in achieving the goals if Federal assistance falls below previous levels." (Page 85)

According to Mr. William Lum of the Department of Housing and Urban Development, it is anticipated that federal funds available for housing assistance will decline in 1982 and future years.

D. Hawaii Business Magazine (June 1981)

In June 1981, Hawaii Business magazine published a series of articles regarding the housing problem in Hawaii. Headlines on the cover of the magazine read "Housing, a Bad Problem Gets Worse." Pertinent excerpts from the various articles are quoted below.

"The depressed national economy has aggravated Hawaii's housing troubles, but those concerns have been mounting for years. In simplest terms, the problem is one of supply and demand." (Page 23)

"The Hawaii State Housing Plan projects that 10,000 new housing starts are needed each year to house Hawaii's fast growing population, although at present, only a little more than half of that demand is being met." (Page 23)

"While the national outlook is grim, in Hawaii the housing crunch is particularly acute for a variety of reasons." (Page 26)

"Another chief cause of the housing shortage is the scarcity of land zoned for residential development." (Page 26)

E. Affordable Housing Issue Paper (December 1981)

This report, dated December 1981, was prepared by Daley & Associates for the State Department of Planning and Economic Development. The report identifies key findings, conclusions and recommendations concerning affordable housing in Hawaii. Pertinent excerpts from this report are quoted below.

". . . from the perspective of the consumer, the current market remains restrictive and unresponsive, with housing prices beyond the means of most residents." (Page 1)

"The sales price of homes has risen rapidly over the past five years and significantly outpaced the increase in personal income. This trend has had the effect of placing home ownership beyond the means of most renters in Hawaii." (Page iv)

Concerning rental vacancies: "Residential vacancy rates have remained below 2 percent for the past five years, whereas, the generally accepted vacancy rate necessary to ensure adequate residential choice and mobility is 5 percent." (Page iii)

"Affordability will remain the primary housing problem for Hawaii for the foreseeable future. In order to accommodate expected growth, however, it is necessary that housing production return to the historic levels of the 1970's. If such production cannot be stimulated, it is likely that a serious housing supply problem will emerge in the 1980's." (Page viii)

"Scarcity of developable, Urban-designated land (particularly on Oahu) had resulted in very high land costs. At an average of \$10.58 per square foot, Honolulu's 1980 residential land cost was the highest in the country." (Page xiv)

"A final area of concern is the transfer of additional lands from Agricultural to Urban classification as a means of reducing housing costs." (Page xv)

F. Letter from Alfred Gobar Associates, Inc. to Hawaii Housing Authority (January 1982)

Alfred Gobar Associates, Inc. is a national consulting firm based in California. They publish "Housing Demand Index" ratings for several urban centers throughout the United States, including Honolulu. These ratings are published monthly in Housing Magazine. The following quotes are taken from a lengthy letter from A. J. Gobar, President, to the Hawaii Housing Authority. The letter is dated January 6, 1982.

"As shown, we simulate an oversupply of housing currently amounting to 8,702 units, a shortage in the single-family sector amounting to 59,946 units and a complementary surplus of multi-family units amounting to 68,648 units. . . What is needed is more low-cost single-family housing oriented to the home ownership sector." (Page 3)

"The demand for single-family housing substantially exceeds the stock of housing in place . . ." (Page 3)

"Of major concern with regard to the Honolulu market is a continuation of high prices." (Page 3)

VIII. ANALYSIS OF POTENTIAL DEMAND FOR ADDITIONAL HOUSING DEVELOPMENT - KOOLAUPOKO DISTRICT

Based upon data from the Department of Planning and Economic Development, State of Hawaii, we have prepared the following table:

SUMMARY OF POPULATION AND HOUSING UNIT TRENDS
Island of Oahu and Koolaupoko District

Year	P o p u l a t i o n			H o u s i n g U n i t s		
	Oahu	Koolaupoko	Percentage	Oahu	Koolaupoko	Percentage
1960	500,409	60,238	12.0	125,795	11,978	9.5
1970	634,700	92,219	14.5	174,742	22,376	12.8
1971	654,400	94,345	14.4	184,101	23,013	12.5
1972	675,700	97,056	14.4	190,973	23,682	12.4
1973	693,400	100,004	14.4	198,970	24,491	12.3
1974	704,300	103,695	14.7	210,940	25,985	12.3
1975	714,300	104,200	14.6	223,647	26,541	11.9
1976	726,000	104,600	14.4	232,669	26,935	11.6
1977	733,800	104,500	14.2	237,571	27,106	11.4
1978	740,300	104,000	14.0	243,103	27,729	11.4
1979	754,000	104,746	13.9	247,465	28,214	11.4
1980	765,900	109,373	14.3	252,038	30,373	12.1
1981	779,100	N.A.	-	254,985	N.A.	-

Source: Department of Planning and Economic Development, State of Hawaii

The above data indicates that, as of 1980, there were 30,373 housing units in Koolaupoko. Based upon a total 1980 population of 109,373, there were 3.6 residents per housing unit.

According to Page 16 of the recently adopted General Plan for the City and County of Honolulu, the projected population (subject to revision) for Oahu is 1,039,000. The guideline "distribution of residential population" for the Koolaupoko District is 12.4 to 13.6 percent of Oahu's total. Thus, the guideline population for the Koolaupoko District in the year 2000 is in the range of 128,836 to 141,304 residents.

Assuming that 13.0 percent of Oahu's projected population of 1,039,000 resided in Koolaupoko in the year 2000, this would reflect 135,070 residents for that district. Utilizing a ratio of 3.6 residents per housing unit indicates a potential for 37,519 housing units in the year 2000. As of 1980, Koolaupoko had 30,373 housing units. Based upon the foregoing projections and assumptions, 7,146 new housing units would be required over a 20-year period from 1980 to the year 2000 to serve the residents of the Koolaupoko District. Over a 20-year period, this reflects about 357 new housing units per annum (7,146 units ÷ 20 years = 357 units per year).

The foregoing analysis is summarized briefly as follows:

<u>Year</u>	<u>Koolaupoko Population</u>	<u>Koolaupoko Housing Units</u>	<u>Residents Per Housing Unit</u>
1980	109,373	30,373	3.6
2000	135,070 ^{1/}	37,519 ^{2/}	3.6

Potential Demand for New Housing Units in
Koolaupoko District (1980 to 2000): 7,146

Average Potential Demand for New Housing
Units Over 20 Years in Koolaupoko District
(Say, 7,146 Units ÷ 20 Years): 357

It should be recognized that the above projected demand for about 7,146 housing units over the 20-year period from 1980 to 2000 is based upon an assumed population of 135,070 residents in Koolaupoko in the year 2000 and an assumed ratio of 3.6 residents per housing unit. The projection does not necessarily reflect the present (unfulfilled) demand for additional housing units and the change in housing trends discussed in the following paragraphs.

For comparative purposes, we analyzed the increase in population and housing units over the 10-year period from 1970 to 1980 as follows:

<u>Item</u>	<u>1980</u>	<u>1970</u>	<u>10-Yr. Increase</u>	<u>Avg. Annual Increase</u>
Koolaupoko Population	109,373	92,219	17,154	1,715
Koolaupoko Housing Units	30,373	22,376	7,997	800

As shown above, 7,997 housing units were added over a 10-year period from 1970 to 1980 in Koolaupoko to serve an increase in population of 17,154 residents over the same period. Thus, the ratio of increased population to increased housing units was 2.15 (17,154 ÷ 7,997). Utilizing this ratio and the potential population increase of 25,697 residents in Koolaupoko for the 20-year period from 1980 to 2000 (135,070 - 109,373 = 25,697) would require an additional 11,952 housing units (25,697 ÷ 2.15 = 11,952) over a 20-year period. Under these assumptions and projections, about 598 additional housing units per annum would be required to serve the potential population increase.

^{1/} Based upon 13 percent of 1,039,000 residents on Oahu.

^{2/} Based upon 135,070 residents and 3.6 residents per unit.

A brief summary of historical population and housing trends for Koolau-poko is shown below:

<u>KOOLAUPOKO DISTRICT</u>			
<u>Year</u>	<u>Population</u>	<u>Housing Units</u>	<u>Ratio of Residents to Housing Units</u>
1960	60,238	11,978	5.03
1970	92,219	22,376	4.12
1980	109,373	30,373	3.60

As shown above, the number of residents per housing unit has decreased significantly between 1960 and 1980. The change is attributed to fewer children per family and changes in lifestyle, i.e., higher divorce rates, single parents, unmarrieds living together, etc.

Based upon the foregoing analyses, we estimate a realistic and conservative demand for additional housing units in Koolaupoko in the range of 500 to 600 housing units per year over the 20-year period from 1980 to 2000. Utilizing this estimate and the projected population of 135,070 residents would result in the following:

<u>KOOLAUPOKO DISTRICT</u>				
<u>Item</u>	<u>1980 Actual</u>	<u>Year 2000 Projected</u>	<u>Total Increase</u>	<u>Ratio of Residents Per Housing Unit</u>
Population	109,373	135,070	25,697	3.60 (1980)
Housing Units (Upper Level)	30,373 (Actual)	42,373 ^{1/}	12,000 ^{1/}	3.19 (2000)
Housing Units (Lower Level)	30,373 (Actual)	40,373 ^{2/}	10,000 ^{2/}	3.35 (2000)

It should be recognized that the projected demand for 10,000 to 12,000 residential units in Koolaupoko over the 20-year period from 1980 to 2000 is significantly less than the increase of 18,395 housing units for the previous 20-year period from 1960 to 1980. Between 1960 and 1980, the average annual increase in housing units was about 920. As discussed previously, 7,997 housing units were added in Koolaupoko between 1970 and 1980, reflecting about 800 units per year.

In summary, we believe our estimate of demand for additional housing units in the range of 500 to 600 units per year in the Koolaupoko District is reasonable and conservative. Depending upon economic conditions and other factors, such as actual population growth, the demand could be greater.

^{1/} Based upon an average increase of 600 units per year over 20 years.
^{2/} Based upon an average increase of 500 units per year over 20 years.

IX. SUMMARY OF CONCLUSIONS

A. Overview

Several housing studies regarding Hawaii's housing problems were reviewed and summarized on previous pages. The studies indicate a severe shortage of single-family residential units in the State of Hawaii. The problem is particularly acute on the Island of Oahu. Several of our major findings and conclusions regarding this market study have been summarized at the front of this report on Pages 2 through 5. For purposes of conciseness, we recommend that the reader of this report review those pages for our overview and general conclusions.

B. Potential Absorption Rate at Heeia Kea Project

As discussed previously, we believe that the Heeia Kea site controlled by Hawaiian Electric Company, Inc. represents a very desirable location for residential development to partially satisfy the demand for new single-family housing on Oahu. The site is conveniently located within a short driving distance to Kaneohe town, and the natural topography will offer excellent views to Kaneohe Bay and the ocean. It is our opinion that the convenient location of the site and its ocean-oriented setting make this site a most desirable major Residential-zoned land holding available for development within the Koolaupoko District.

In a previous section of this report, we estimated there would be a demand for approximately 10,000 to 12,000 new housing units in the Koolaupoko District over a 20-year period from 1980 to 2000. This projection reflects there would be an average demand for about 500 to 600 new housing units per annum in the Koolaupoko District over the 20-year period. We believe this is a reasonable and conservative estimate.

The real estate industry is a very cyclical business that depends upon the general economy and other factors. Typically, a greater number of residential units are constructed and absorbed during a period of strong economic activity than during a weak economy. Therefore, it is difficult to predict accurate year-by-year absorption patterns. However, it is possible to reasonably project average trends in absorption patterns.

In order to project the potential absorption rate for residential units at Heeia Kea, we have reviewed several major residential projects developed on Oahu during recent years. Details regarding these projects are contained in our files. Two residential subdivision projects that have been marketed during recent years in areas surrounding the subject property are summarized below.

<u>Residential Subdivision Project</u>	<u>Number of Lots</u>	<u>Started Marketing</u>	<u>Approximate Time to Market</u>
Ahuimanu Hills Increment II	74	Late 1979	2 Years
Haiku Knolls Subdivision, Heeia	75	Dec. 1980	2 Years

It should be noted that the Ahuimanu Hills Increment II project involved marketing vacant residential lots and house/lot packages. Marketing of the lots and/or house/lot packages required about two years, reflecting an absorption rate of approximately 37 lots per year. The Haiku Knolls subdivision at Heeia consisted of 75 lots, including 20 duplex lots. Marketing of this subdivision included marketing house/lot packages, bulk sales to other builders and individual lot sales to various buyers. The absorption rate averaged about 35 to 40 lots per year.

It should be noted that the housing market was relatively strong in 1979 and early 1980. However, interest rates climbed significantly during 1980 and the housing market weakened from previous levels. The housing market was relatively weak during 1981 and 1982.

The proposed Heeia Kea residential project will include a total of 389 new residential lots. A timing schedule for the proposed project has not been determined to date. Based upon our investigations and analyses, we conservatively project that approximately 40 to 60 residential lots per annum could be successfully marketed over the next several years. It should be recognized that during strong periods of market demand, the sales pace could range from 60 to 100 lots per year. However, we do not believe such a high absorption pace can be maintained consistently. A sales pace of 40 lots per year would require almost 10 years to market the project. A sales pace of 60 lots per year would require 6.5 years to market the project.

In summary, we estimate that it would require about 6 to 9 years to successfully market the proposed Heeia Kea residential lots at prevailing market prices. It is possible that the project could be marketed in a somewhat shorter time frame.

C. Brief Analysis of Hawaii's High Cost of Housing

The Research Division of First Hawaiian Bank contained an excellent article entitled "Hawaii's Unaffordable Housing" in its "Economic Indicators" monthly report issued December 1982. Four major reasons attributed to the high cost of housing were: "(1) developers bear the full costs of roads, curbs, sewers, etc., whereas in many Mainland locations the government provides these facilities and spreads the cost among all the taxpayers, (2) the price of cement, a large factor in site preparation, is higher here, (3) much of our residential land is hilly and difficult to develop, as most level land is classified agricultural, and (4) regulatory requirements for subdivisions are unnecessarily elaborate. Hence, it is the cost of the site that accounts for a great part of Hawaii's higher housing prices."

A copy of this article is contained in Exhibit 1 of the Addenda of this report. As discussed in that article, FHA statistics show that the average Hawaii site price in 1980 was \$60,048. This was about 5.5 times the U.S. average of \$11,009, and 3 times the \$20,853 average per lot for California, the second most expensive state. Further, the average lot size in Hawaii was 5,901 square feet as compared to the

U.S. average of 12,807 square feet. Based upon an average lot price of \$60,048 and an average lot size of 5,901 square feet, the average unit price per square foot was \$10.18 for residential lots in Hawaii. This is about 12 times the U.S. average of \$0.86 per square foot. The article goes on to point out that Hawaii represents a classic case of market supply and demand. The article goes on to state that "demand is high because Hawaii is a desirable place to live, and supply is short because we have chosen to legislate severe restrictions on land use."

As discussed previously in this study, the Department of General Planning has proposed significant land areas on Oahu that are presently zoned Residential to be designated Agricultural and/or Preservation. With respect to the Koolaupoko District, approximately 3,200 acres of Residential-zoned land were scheduled for down designation to Agricultural and/or Preservation on the proposed Koolaupoko District Development Plan. It is our opinion that the proposal to delete this significant amount of land from the available supply of Residential-zoned land will further escalate the raw land cost of remaining Residential-zoned lands and, accordingly, further increase the cost of housing on Oahu.

D. Conclusion

In summary, the Heeia Kea site represents an excellent location to develop new single-family housing on Oahu. It is perhaps one of the most desirable Residential-zoned land holdings available for future development within the Koolaupoko District. We conservatively estimate that 40 to 60 single-family residential lots per annum could be absorbed at this location over the next several years. During periods of strong market demand, the sales pace could range from 60 to 100 lots per year.

The location of the site, within a short driving distance to Kaneohe town, and a natural topography that will offer excellent views to Kaneohe Bay and the ocean lends itself to providing housing for the middle-class market. We believe there will be an excellent demand for middle-class housing developed at this location. It is important to recognize that providing housing to middle-class residents opens up lower economic levels of housing for low-cost and mod-cost units, as people who purchase lots and/or houses at the middle-class price level typically resell or rent their existing housing units to others who are presently in lower economic levels. Therefore, providing housing to the middle class opens up new housing opportunities for all lower economic levels seeking housing opportunities.

ADDENDA

Economic Indicators

A Monthly Report by the Research Division

Dr. Thomas K. Hitch, Senior Vice President Shurei Hirozawa, Vice President

December, 1982

Hawaii's Unaffordable Housing

Average home prices are high all over the nation, but it is well known that they are highest of all in Hawaii. The Honolulu Board of Realtors Multiple Listing Service showed an average price of \$184,559 for single-family homes sold in the first seven months of 1981, while for the same period a National Association of Realtors survey of 15 major metropolitan areas showed the average price of a San Francisco home, most expensive of the cities surveyed, at \$133,900—\$50,000 less than Honolulu's average—while prices in the other cities ranged downward to Pittsburgh's \$59,000.

Yet Honolulu's construction costs are not much above average, according to McGraw Hill *Housing* magazine surveys of the labor and material costs of building the same good-quality 1,500-square-foot ranch house in 100 cities. The August 1981 survey showed that the cost of constructing this house in Honolulu, at \$80,684, was considerably lower than in Fresno at \$88,380 or San Francisco at \$86,713, somewhat lower than in Cleveland and San Jose, and about the same as in Los Angeles, Sacramento, Stockton, and Detroit. Materials costs to build the house in Honolulu, at \$46,684, were only a couple of hundred dollars more than in Fresno and Cleveland even though most of our building materials must be shipped 2,000 miles. Labor costs in Honolulu, at \$34,000, were lower than in these eight cities, though higher than the U.S. average of \$29,790.

The *Housing* survey does not include land costs, site development costs, developers' overhead, contractors' profit, or local taxes like Hawaii's 4 percent excise tax on contracting. All of these must be added into the final sales price. Raw land is more expensive in Hawaii than in most Mainland areas. Site development costs are higher here because (1) developers bear the full costs of roads, curbs, sewers, etc., whereas in many Mainland locations the government provides these facilities and spreads the cost among all the taxpayers, (2) the price of cement, a large factor in site preparation, is higher here, (3) much of our residential land is hilly and difficult to develop, as most level land is classified agricultural, and (4) regulatory requirements for subdivisions are unnecessarily elaborate. Hence it is the cost of the site that accounts for a great part of Hawaii's higher housing prices.

In 1960 Federal Housing Administration statistics showed the average market price of residential sites in Hawaii at \$6,502, roughly two and a half times the U.S. average of \$2,492. In 1961 Hawaii became the first state to pass a land use law, in which we seem to take great pride. By 1980 the FHA statistics showed the average Hawaii site price at

\$60,048—about five and a half times the U.S. average of \$11,009, and three times the \$20,853 average for California, the second most expensive state. Worse yet, the average lot size in Hawaii is 5,901 square feet, compared to the U.S. average of 12,807, which works out to \$10.18 per square foot for Hawaii lots—12 times the U.S. average of 86¢ per square foot. Here we have a classic case of market supply and demand. Demand is high because Hawaii is a desirable place to live, and supply is short because we have chosen to legislate severe restrictions on land use.

Ohana zoning (permitting construction of a second residence on a lot zoned for one) is the first easing in the last two decades of restrictive government policies that have helped to drive home prices so high. If homeowners take advantage of it, Hawaii's housing stock can be increased considerably at almost half price: just the construction cost without the lot cost. But any lot that can hold two houses will likely become even more valuable. Residential lots will continue to escalate in price unless a great deal more land is classified urban and zoned residential.

The President's Commission on Housing reported in 1982 that nationwide the cost of land as a percent of the total cost of single-family homes increased from 19 percent in 1970 to 24 percent in 1980. Hawaii's lot price is 40 percent or more of the total package. The Commission commented: "Excessive regulation raises housing costs by restricting available land, imposing unnecessary requirements in site development and construction standards, and lengthening the time needed to obtain regulatory permits. Many studies have examined the impact of governmental regulations on the costs of single-family homes, and . . . all the studies have a common finding: regulations increase costs—as much as 25 percent of the selling price in some cases."

Land use laws and zoning and building regulations protect the established homeowner, who wants his environment nice and his real estate value high. As long as we cry, "No developments in my neighborhood!" and "No building on agricultural land!" we perpetuate the residential land shortage that causes our higher home prices. Government regulations presumably reflect the will of the citizens, and the citizens have chosen (perhaps wisely, in view of Hawaii's limited land area and special beauty) to keep Hawaii green, and to let the new generation of homeowners pay the price—if they can.

There is no way to have both restrictive land use policies and affordable housing. Ohana zoning is only one small step in the right direction.



First Hawaiian Bank

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New Home Sales Spur Construction

By Jerry Tuno, Star-Bulletin Writer

NEW home sales are moving at such a fast pace that some developers are accelerating plans for new subdivisions. The experience in the past few months is similar to a national trend that likely will affect both new sales and the resale market. There are just a few examples of what's happening in new home sales:

Millant Town, started the summer (when interest rates were high) with 218 homes to let. Millant Town, which has not had F.I.A. financing since last year, decided it wanted F.I.A. approval and got it in September. The approval came as F.I.A. lowered its rate to 12 1/2 percent. The level of 12 percent, which Millant has sold 188 of the 218 homes — or about 85 percent of the product.

Gentry Waipio also is busily selling homes. So far Gentry has sold 127 of its smaller homes (900 square feet to 1,251 square feet) and 190 of its two-

bedroom 750-square-foot Balmow series homes in eightplex buildings. Village Park, which is selling homes without models, reported that November was its best sales month since about 1979. Construction of 16 homes is under way.

All OF THIS activity in central Oahu, the primary new construction area, is continuing even after Thanksgiving — the normal slowdown point for home buyers who in most years will start thinking more about the holidays and less about new homes. But this year, with rates plunging to 12 percent, the buying fever is strong. And new product is in relatively short supply (see Page 2).

Millant said the bulk of its sales has come in the last 90 days: 39 sales in October, 47 sales in November, and 20 sales last week, according to Bill Barrett, Millant sales manager. "People are thinking they better move or lose out," said Barrett. "Normally visitor traffic drops off the weekend, after-

prices from about \$130,000 to \$180,000 average of \$148,000. The market seems to have changed dramatically since last summer when both Gentry and Millant went to smaller homes because of the high interest rates which made larger homes unaffordable for most buyers. Now Barrett says most of the buyers want to buy homes to their absolute limit, according to F.I.A. qualifying standards, and this means the \$130,000 mortgage is now more commonplace. Millant is also seeing a difference in the type of deals being arranged. In the past, conditional or contingency sales where buyers had to sell their old home to buy a new one were about 60 percent of the sales at Millant. Now Barrett says these contingency sales represent less than 5 percent of the sales.

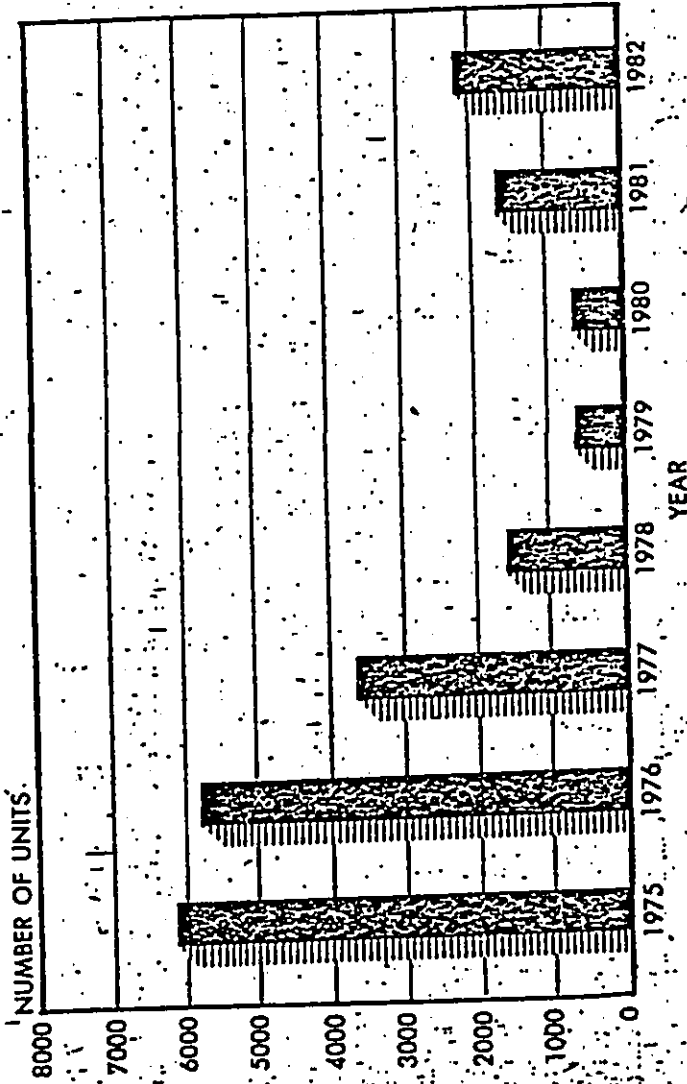
THE LACK of new home product to sell may eventually help the homeowners trying to sell their older homes. This resale market already has picked up briskly since the F.I.A. rates

and conventional rates came down. These sales appear to be going to owner-occupants and a good share of first-time home buyers. Developer Tom Gentry says business is good and will be better in January when new areas open up. Gentry hopes to have approvals in January to offer another 252 small homes. These will come in increments of 128 and 164 units. Homes will be built in groups as contracts are approved. There will be a new Gentry home of 880 square feet. Pricing for the homes is still not complete but the model 990 will be priced at \$111,900. Gentry has a slightly different approach to construction and fabricates sections of the homes (walls, roof trusses, for example) at a factory in the Gentry Industrial park. These parts of the home are put on a finished trailer and then hauled a short distance on a private dirt road to the construction site. Gentry has been using F.I.A. programs with success and reports that the 990-square-foot

home has been the most popular of the small homes. VILLAGE PARK has sold 550 homes since opening about four years ago and has had to build another 1,200. Craig Champion, vice president of the Waitec Company, said this probably will provide another five years of construction and sales. This past week workers began pouring slabs for 18 new homes that signal the turnaround in home construction.

Champion said that they have cut about \$20,000 off home prices by reducing the size of homes to an average of about 1,000 square feet. Prices now range between \$109,000 and \$120,000. Village Park offers both F.I.A. and VA programs. Champion says that they are seeing buyers going for as large a mortgage as possible under these programs, just as Millant Town, reported F.I.A. and VA programs offer several advantages compared with conventional programs, including lower closing costs.

A Shrinking Inventory



The resale market is definitely benefiting from the lower FICA and VA interest rates and the brisk activity in new-home sales raises the possibility that some day there could be a lack of new product, according to Michael Sklarz, director of research at Locations Inc.

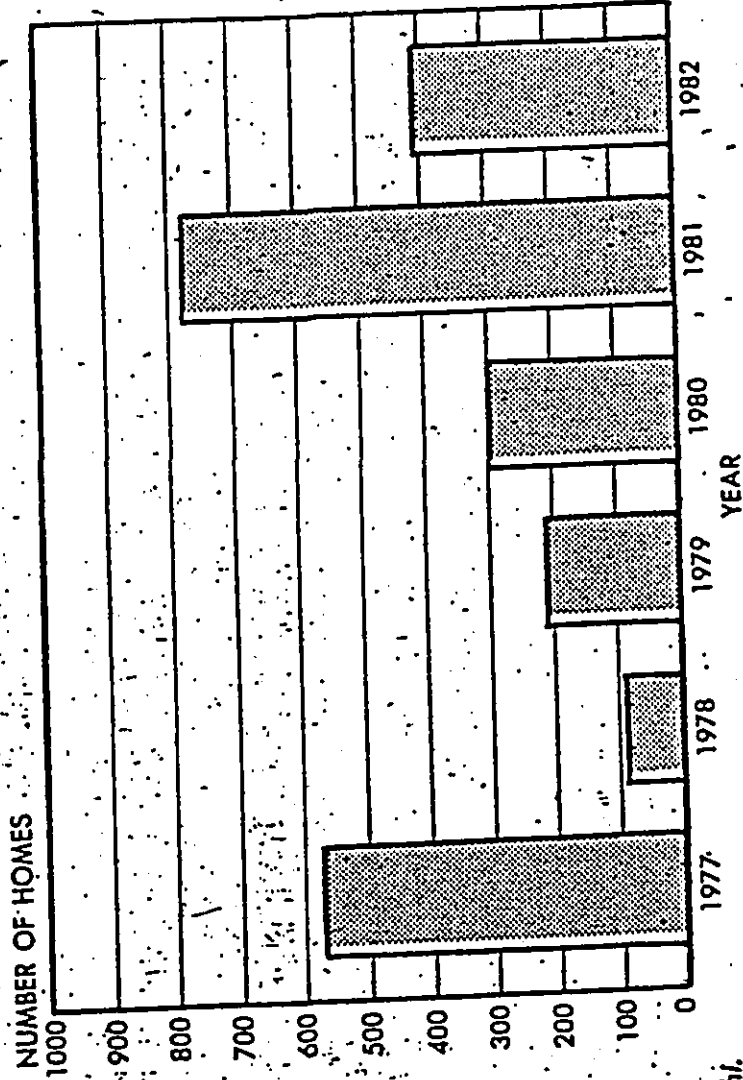
Sklarz has been looking at national figures, which show that the sold rate for new single-family homes and the number of months remaining in this supply have both been on a declining graph line. Hawaii follows the Mainland trend and Sklarz says the turnaround time to get construction started again will be even longer for a variety of reasons.

Hawaii home builders have not been putting up large subdivisions, and usually build after the sales contracts are signed and the buyer qualifies for the loan, so they have avoided the glut of inventory that some cities on the Mainland are experiencing.

While national figures show a building estimate of 1.3 million units next year, the demand is estimated at 1.7 to 1.9 million units. Even if new housing construction goes up 30 percent next year, it won't be enough to keep up with demand, Sklarz says.

Figures from the monthly Monitor report, a local research publication, have been put in bar graph form (at right) to show how the present inventory of new condominiums (top graph) and homes (bottom graph) compare with former years.

The graphs show the relatively low amount of inventory. And some of this already is committed to rental agreements, which also takes the inventory off the market for a time.



Graphs by Star-Bulletin Artist Roy Higuchi.

QUALIFICATIONS OF WILLIAM J. DORNBUSH, M.A.I.
REAL ESTATE CONSULTANT AND APPRAISER

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Licensed Real Estate Broker, State of Hawaii

Member, American Institute of Real Estate Appraisers (M.A.I.)
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PREVIOUS PROFESSIONAL BACKGROUND

Senior Appraiser (1971-1975), Don R. Cowell & Associates, Urban Land Economists
Project Manager (residential condominium and neighbor island resort development)
during 1974 and 1975 at Blackfield Hawaii Corporation (the parent company of
Don R. Cowell & Associates)

EDUCATION

B.A., University of Illinois, 1968 (Finance, Major; Mathematics, Minor)
Real Estate Courses: Property Valuation, Real Estate Development and Finance,
Urban Land Problems.

SPECIAL COURSES

Investment Analysis Seminar presented by the American Institute of Real Estate
Appraisers, 1973, Honolulu. Dr. James A. Graaskamp of the University of
Wisconsin served as instructor.

American Institute of Real Estate Appraisers Course VI, Investment Analysis
(Ellwood Course), 1975, Honolulu.

Construction Management Seminar, presented by AMR International, Inc., 1974,
San Francisco.

GRI Course VI, Investment Real Estate, Small Business Management Program,
University of Hawaii, 1975.

FAA Rated Commercial Pilot.

MILITARY

U.S. Navy Reserve, 1969-1971. Graduated from Aviation Officer Candidate School,
Pensacola, Florida. Designated Naval Flight Officer.

PROFESSIONAL EXPERIENCE

Engaged in real estate valuation since 1971 including ten months at the Guam
office of Don R. Cowell & Associates.

State of Hawaii assignments include appraisals, feasibility analyses, market
studies and counseling regarding office buildings, industrial properties,
residential condominiums, restaurants, shopping centers, hotels, resort areas
and large scale land developments. Geographical areas covered include the
Islands of Oahu, Maui, Hawaii, Kauai and Lanai.

Territory of Guam assignments include the valuation of private land parcels for
tax assessment purposes on the Island of Guam for the Department of Revenue
and Taxation, Government of Guam; valuation studies regarding resort hotels,
industrial properties, rental apartments, condominium apartments, commercial
developments including office buildings and restaurants, and residential
tract projects.

Other experience includes assignments and research in American Samoa, Fiji,
Ponape, Truk and the Island of Saipan, Marianas Islands.

APPENDIX C

ARCHAEOLOGICAL RECONNAISSANCE



JOSEPH KENNEDY
Archaeologist

ARCHAEOLOGICAL CONSULTANTS
of
HAWAII

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AN ARCHAEOLOGICAL RECONNAISSANCE AT HEEIA KEA

Prepared for:

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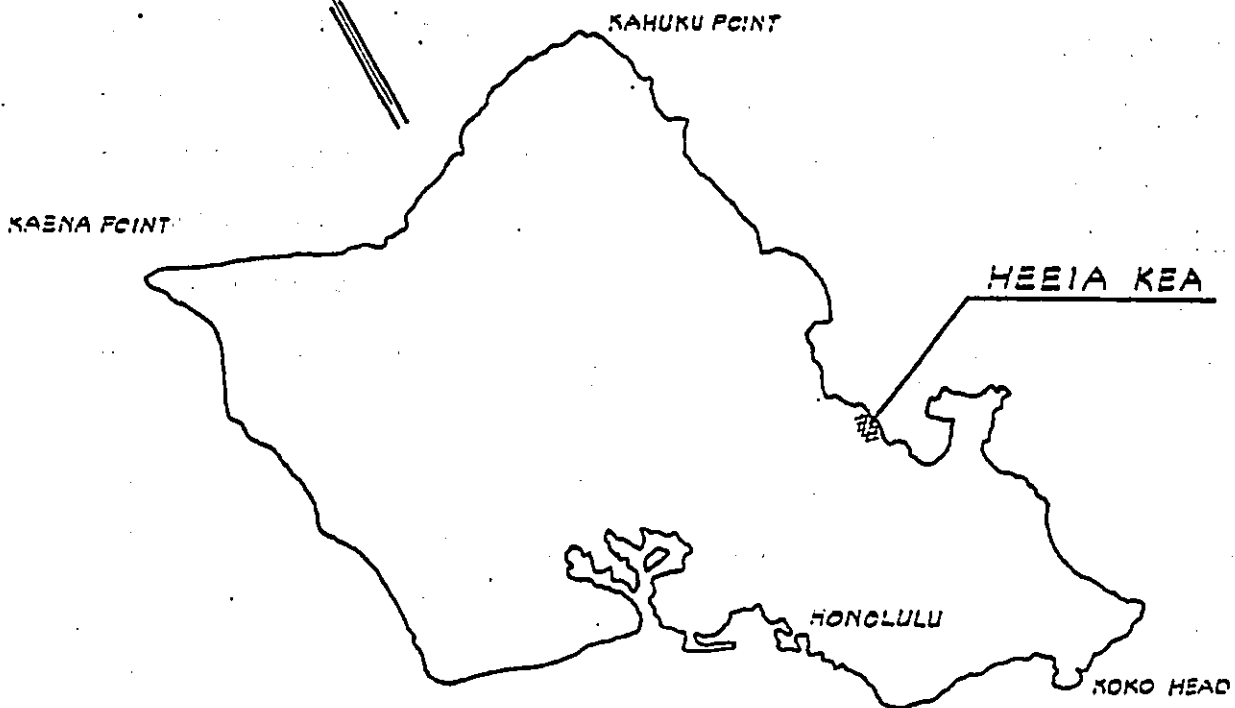
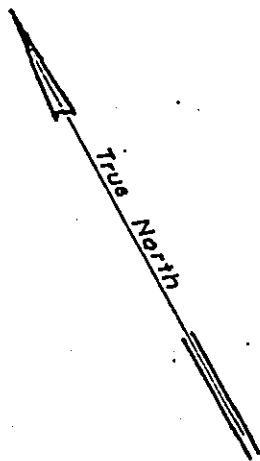
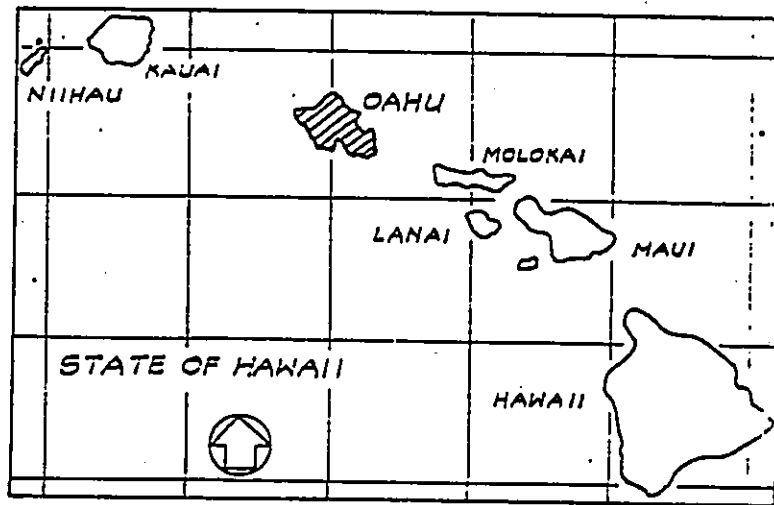
Prepared By:

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Summary

Between October 7 and 22, 1982 Archaeological Consultants of Hawaii, Inc. conducted a reconnaissance survey of just under a hundred acres of property at Heeia Kea. A total of five sites were located, three terraces and two religious structures. These sites were mapped to scale and their approximate locations fixed on a site map. Conclusions and recommendations are made regarding these sites and future archaeological work.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



OAHU
Scale : 1 in. = 10 mi.

Physical Setting

Heeia Kea (TMK:4-6-06:1,2,4,7-16, 22-51 and 4-6-16:32) is located on the windward coast of the Island of O'ahu, between Kaneohe and Kahalu'u. The property is located in the Ko'olaupoko District (Ahupua'a of Heeia). The subject parcel fronts the ocean near the Heeia Kea boat launch ramp and is a headward valley with 500 to 600-foot ridges on three sides. The slopes of these ridges are covered with Christmas berry (Schinus terebinthifolius), prickling, older lantana (Lantana camara) and California grass (Brachiaria mutica) whose tops are often well overhead. Lower elevations at Heeia Kea are dominated by koa haole (Leucanea leucocephala), woodrose (Opereculina tuberosa), monkey pod (Samanea saman), coconut (Cocos nucifera), California grass and a variety of vines that hang from surrounding trees and wrap in thick coils along the ground.

The rainfall at Heeia Kea is usually between 75 and 100 inches a year. There are no permanent streams on the property, however, deeply cut ravines indicate intermittent stream action at many locations. There is a freshwater spring in the mauka section of the parcel, but at the time of the survey, no running water reached the sea.

Previous Archaeological Work In the Area

As indicated in my report of February 5, 1982, An Archaeological Literature Search for Heela Kea, no previous surveys or excavations have taken place at this location. There has been mention of "someone from the Bishop Museum" who had given the area an archaeological inspection in the past "two or three years", however, I haven't been able to determine who this person is nor do I know of any written report concerning Heela Kea on file at the Museum.

Methodology

Before discussing the methodological approach used in the archaeological field survey at Heela Kea, it is important to discuss how the land is divided. Hawaiian Electric Company, Inc., under a lease and agreement-of-sale with Kamehameha Schools/Bishop Estate holds approximately 220 acres of land at Heela Kea. Just under half of the total acreage was subject to archaeological examination between October 7 and 22, 1982. The reason why under 50% of the property surveyed is that 116.1 acres of the total are zoned P-1 (Preservation) and any archaeological sites that may be located on these acres would not be subject to any direct adverse impacts and therefore were not surveyed. It should be noted that no less than three trips were made into a certain portion of the P-1 acreage in an attempt to locate some "rock platforms or heiaus" that were reported by one of the current residents of the

property. Every attempt to locate these structures was unsuccessful. The individual who reported these sites either could not or would not take me to them and declined to give specific directions or point to the general location on the map. I can only assume that these structures either don't exist, have been destroyed recently, were so overgrown that they were overlooked each time we searched for them, or lastly, and most likely, that they are quite a distance mauka from the R-6 boundary line and near the very edge or off the entire property.

An additional two acres are covered by the Hawaiian Electric base yard and 14.3 acres by existing homesites. These areas were also not surveyed for obvious reasons.

The remaining acreage within the R-6 boundary line was subject to survey sweeps that were fixed by features in the landscape (i.e. ridge lines, noticeable trees) and compass bearings. At least three and sometimes five individuals made up the survey team. In either case members were stationed approximately 10 meters apart and every effort was made to stay on a compass bearing. It should be noted that many portions of the property are covered with very dense jungle and visibility is extremely limited. Some areas were so thick that forward movement was only possible by laying flat on the ground and crawling - in some cases for 20 minutes at a time. In survey conditions like this, it is not uncommon for trained field workers to unwittingly bypass some features. However, extra field

time was awarded to ACH by HECO and as a result special attention was given to areas where there would be a high likelihood of site occurrence (e.g. areas around known sites, near water, level tracts, etc.). Certainly, very few archaeological survey reports can claim to have examined 100% of any sizeable parcel and especially ones covered with thick jungle.

Selected Historical Events That Affect the Archaeological Remains at Heela Kea

An examination of an early map made by Alexander and Baldwin demonstrates that at least as early as 1913, a great deal of the land at Heela Kea had been dedicated to the growth of pineapple. A separate map, made three years later in 1916 indicated that the pineapple operation had expanded somewhat and occupied a majority of the land. No residential sites appeared on the 1913 map and only one the 1916 map. The introduction of a commercial pineapple-growing operation surely had an impact on any archaeological/early historic above ground features that may have once existed at Heela Kea. It may be assumed that initial land clearing efforts were designed to facilitate the planting and harvesting of the new cash crop and this would necessitate the razing of any substantial mounds or platforms. Such features along with inconvenient terracing and trails would take up valuable space, be an obstacle to planting, maintenance, and harvesting, and generally

upset the consistency of any farming operation of this nature.

The pineapple operation at Heeia Kea was to last no later than the 1930's. By this time informants have told me that the property had been converted to pasture land. This development helps underscore the nature of the previous land clearing exercise at this site. Relatively flat, open, and unobstructed lands are the ones best suited, and therefore often chosen by ranchers for grazing animals. Further impact to the archaeological coastal zone occurred at this time with the construction of Kamehameha Highway and private homes which sprang up along the sea front just mauka of the road.

The outbreak of World War II in the early 40's also had a direct impact at Heeia Kea. Military records indicate that \$274,000 was spent to construct camp facilities for one Regimental Combat Team at Heeia, Island of O'ahu. Work on this facility began on October 1, 1943 and was completed three months later on the first day of the new year, 1944. Although the records indicate that construction took place at Heeia, there are a number of reasons why I believe the facility may have been located on the subject parcel at Heeia Kea. First, many local people remember the Army having control of and using the property at that time. Next, overgrown roads wind through the property and are said to have been made by the U.S. Army Corps of Engineers in the 40's. There are some concrete foundations and rusted

water pipes in the interior of the property and these are also most likely the work of the Corps of Engineers. Finally, aerial photos of the reef fronting the Heeia Kea property show the scars of many tank-like tracks indicating that a number of amphibious practice landings were made along the beach and presumably carried a distance inland as well. What degree of practice bombing and shelling, if any, is unknown. We can be sure that during the Army's tenure here, bulldozers moved around large amounts of land and stone for roads, pipe was laid, barracks and bunkers built, and invasions practiced. All told, the impact of these activities on any archaeological sites that may have still remained on the property was potentially very substantial.

After the war, small family sized dwelling units reappeared and were mostly located near Kamehameha Highway in the maka section of the property. To the best of my knowledge the property has remained occupied in this fashion up to this writing. Some years ago an automobile graveyard was established at Heeia Kea and the remains of this enterprise are scattered about the property in the form of rusted car bodies and engines. A final factor affecting the landscape was the arrival of so-called "hippies" in the late 1960's. Local people told me that groups of these "hippies" lived for a time in the mauka section of the property.

The Archaeological Sites at Heela Kea

Five archaeological sites were located in the course of the recent survey at Heela Kea. It is not surprising that these features are all located along the edges of the property line, and away from the thrust of the pineapple, military, and contemporary settlement activities. Two of the five sites appear to be religious structures and the remainder are associated with agricultural pursuits. Vegetation on and around on these sites was considerable so all were cleaned and prominently marked with orange engineers flagging tape. Site markers may be identified by the letters ACH-HK and the site number (1 thru 5). I believe that all five sites are within the present R-6 boundary line, however, it was impossible to accurately fix the position of the sites due to time constraints and the absence of a ground survey map. When and if a ground survey team maps the area, exact locations can be plotted and reflected on that map. As mentioned earlier, additional sites were reported but not located by our survey team. I believe that these sites (if they still exist) are well beyond the R-6 boundary line and quite a ways up in the Preservation area. In addition to the five sites listed and described below, there is a substantial bottle dump of undetermined size and significance located on the property. Its general location will be marked on the site map in this report.

ACH-HK-1

ACH-HK-1 is a small mounded terrace that is 7.3 meters long and 2.25 meters wide. It is backfilled and .5 meters high at its highest point. It is the third largest site on the property and in terms of altitude, the highest. Although backfilled and forming a terrace of sorts, HK-1 also appears to be a small mound. Wall thickness is greater than most terrace walls. Construction is of a traditional Hawaiian design and there is no visible associated midden. The combination of terrace and mound may indicate that the structure was used for the cultivation of uala or sweet potatoes (Ipomoea batatas). Extra thickness of wall size may have been used to accommodate the vine.

ACH-HK-2

HK-2 is a terrace wall 65 centimeters high at its greatest point, and 5.1 meters long; the structure has a width of 1.22 meters at its widest point. The small terrace is backfilled like HK-1, and also of traditional Hawaiian design. Terraces of this sort are sometimes associated with the production of dryland taro.

ACH-HK-3

HK-3 is a terrace wall that could be called a mixture of HK-1 and 2. While clearly backfilled and acting as a terrace, the thickness of the wall

reminds one of a mound partially built into the slope of the landscape. The terrace wall is 7.9 meters long by 1.6 meters wide and reaches a height of nearly 500 centimeters.

ACH-HK-4

Archaeologically speaking, HK-4 is the largest and most significant non portable artifact remaining on the surface at Heeia Kea. This 8.7-meter x 5.6 meter feature rises a full 2 meters above the ground in front of it. HK-4 is not a free standing structure however for its mauka section rests against the earth.

In 1933, Gilbert McAllister gave the dimensions of a small O'ahu heiau as "50 by 40 feet". Using these figures as a start, we may assume that HK-4 having more modest dimensions than McAllister's "small heiau" figure, would be better classified as a shrine. Sir Peter Buck defines a Hawaiian shrine as "...a simple altar without a prepared court. They were made by individuals or small family groups who conducted a short ritual which required no priest." (Buck, 1964). Offerings were placed on this structure and the carved image of a god could be set up on it as well. In this category there are household and occupational shrines dedicated to a variety of family gods and professions. All these together are termed kuahu. A fisherman's

shrine received a specific term koa and was distinguished by its location which was, as one might expect, close to the sea. HK-4 is not located in the immediate vicinity of the beach and so most likely is not a koa. I believe HK-4 is a family shrine - a large kuahu.

ACH-HK-5

HK-5 is a 4-meter by 3.4 meter stone platform that is 500 centimeters high. It appears to be a small altar and by merit of its close proximity to HK-4 may be somehow associated with it.

Conclusions and Recommendations

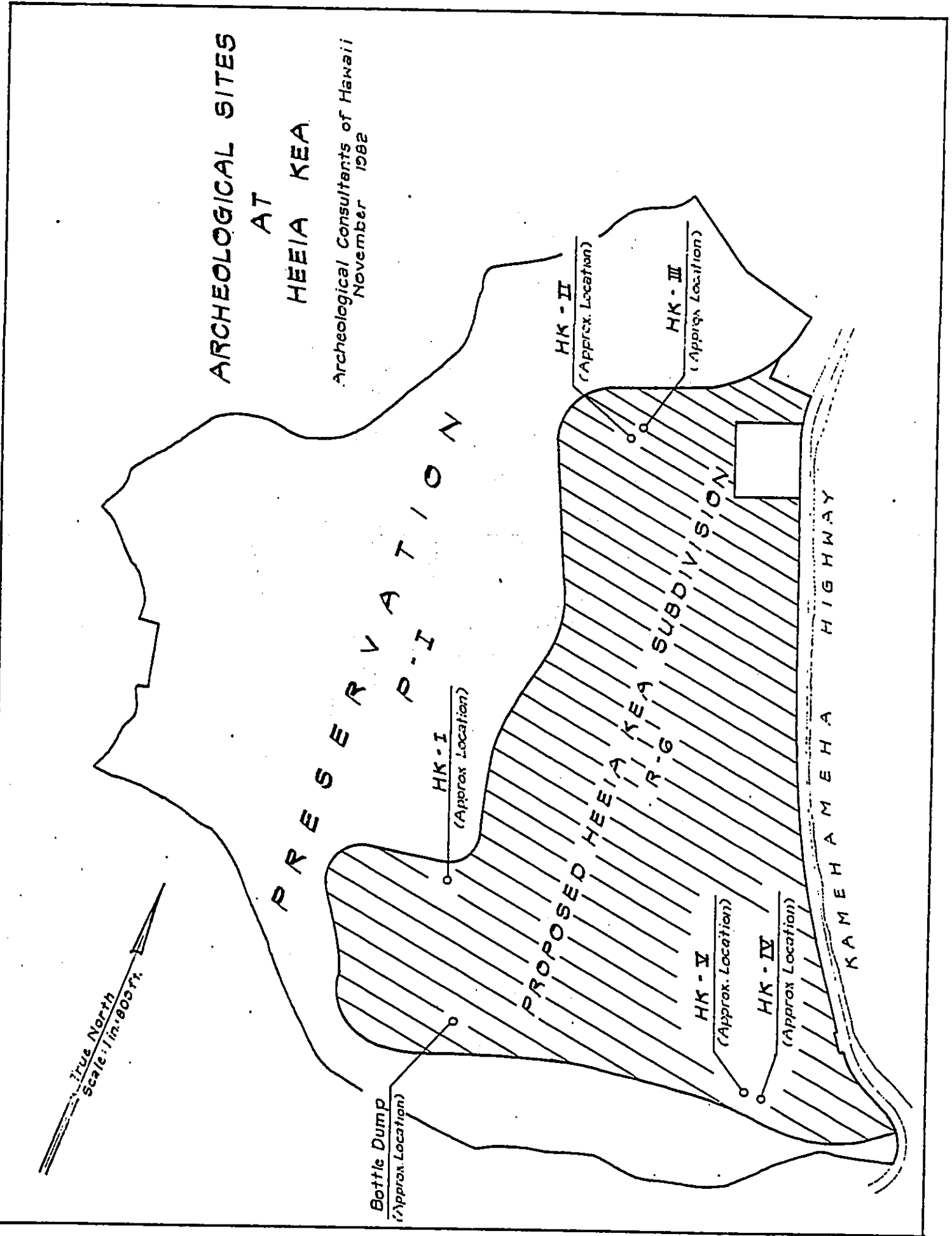
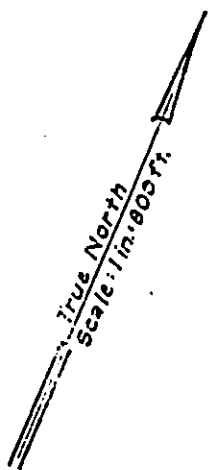
As mentioned earlier in this report only five above ground archaeological sites were located on the 116 acres surveyed at Heeia Kea. These sites are not all clustered in one spot, but rather are scattered along the boundary lines on the margins of the property suggesting that more sites were once located in the interior. This phenomenon can lead us to two very broad conclusions. First, that some use was made of the land at Heeia Kea and that these activities most likely predate the arrival of Captain Cook. The nature of the sites recorded (religious and agricultural) allow basis for extrapolation. The second conclusion is that any additional above ground remains of human occupation on this property have been decimated by various actions between 1913 and the present.

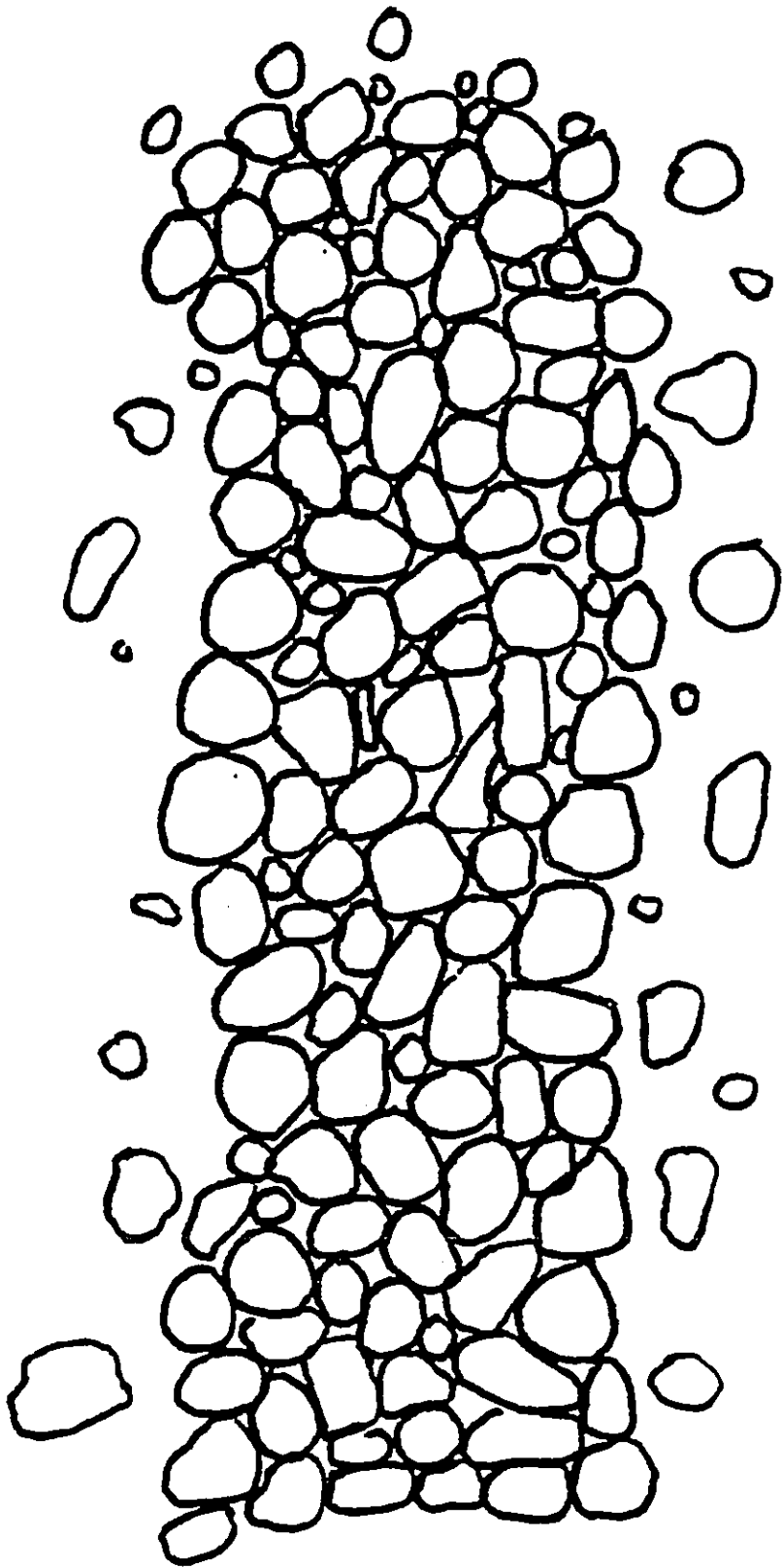
The three minor terraces/mounds remaining on the property together with HK-5 are of little archaeological consequence and are unlikely to provide much useful information. HK-4 on the other hand is a nice example of the type of shrine that once was a frequent sight in ancient Hawaii under the kapu system. It should be noted that structures of this nature are a rapidly diminishing cultural resource in the Islands and some thought should be given to the restoration and or preservation of this site should it be endangered by development activities.

Finally, Heeia Kea before contact must have been, like it is now, a very attractive place to live. The property afforded a sandy access to reef and ocean. It would be worthwhile to have a stratigraphic look at this property which was most likely the locus of prehistoric activities. Archaeological information of this nature for windward O'ahu is particularly weak. Also, there is a good possibility that subsurface features exist at Heeia Kea. For these reasons it is recommended that an archaeologist be present to monitor the land clearing and grubbing phase of any proposed construction.

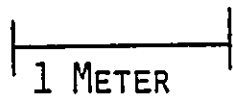
ARCHEOLOGICAL SITES
AT
HEEIA KEA

Archeological Consultants of Hawaii
November 1982

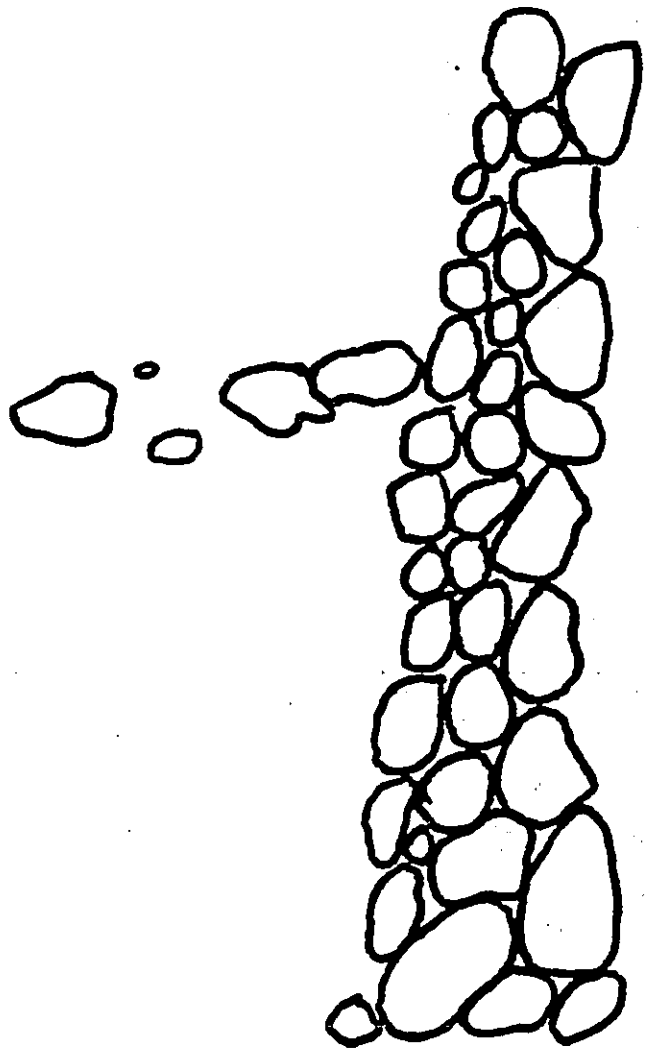




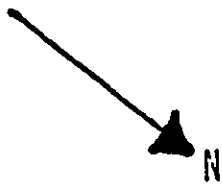
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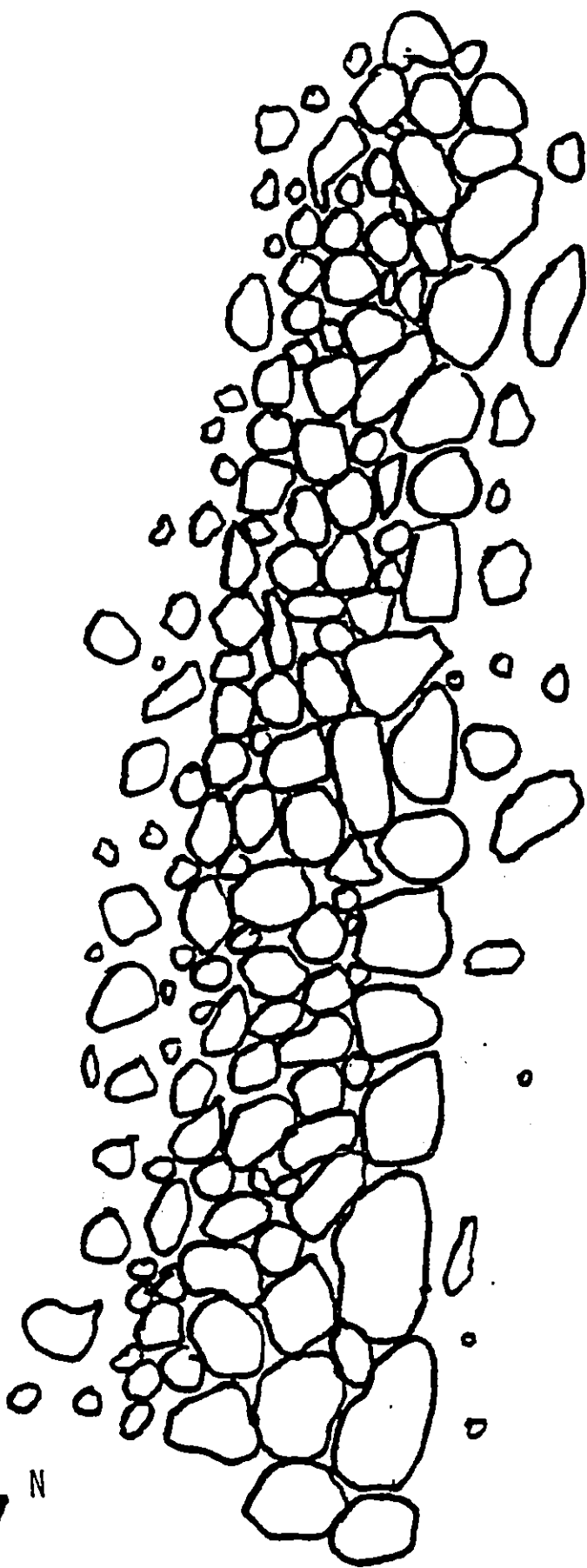


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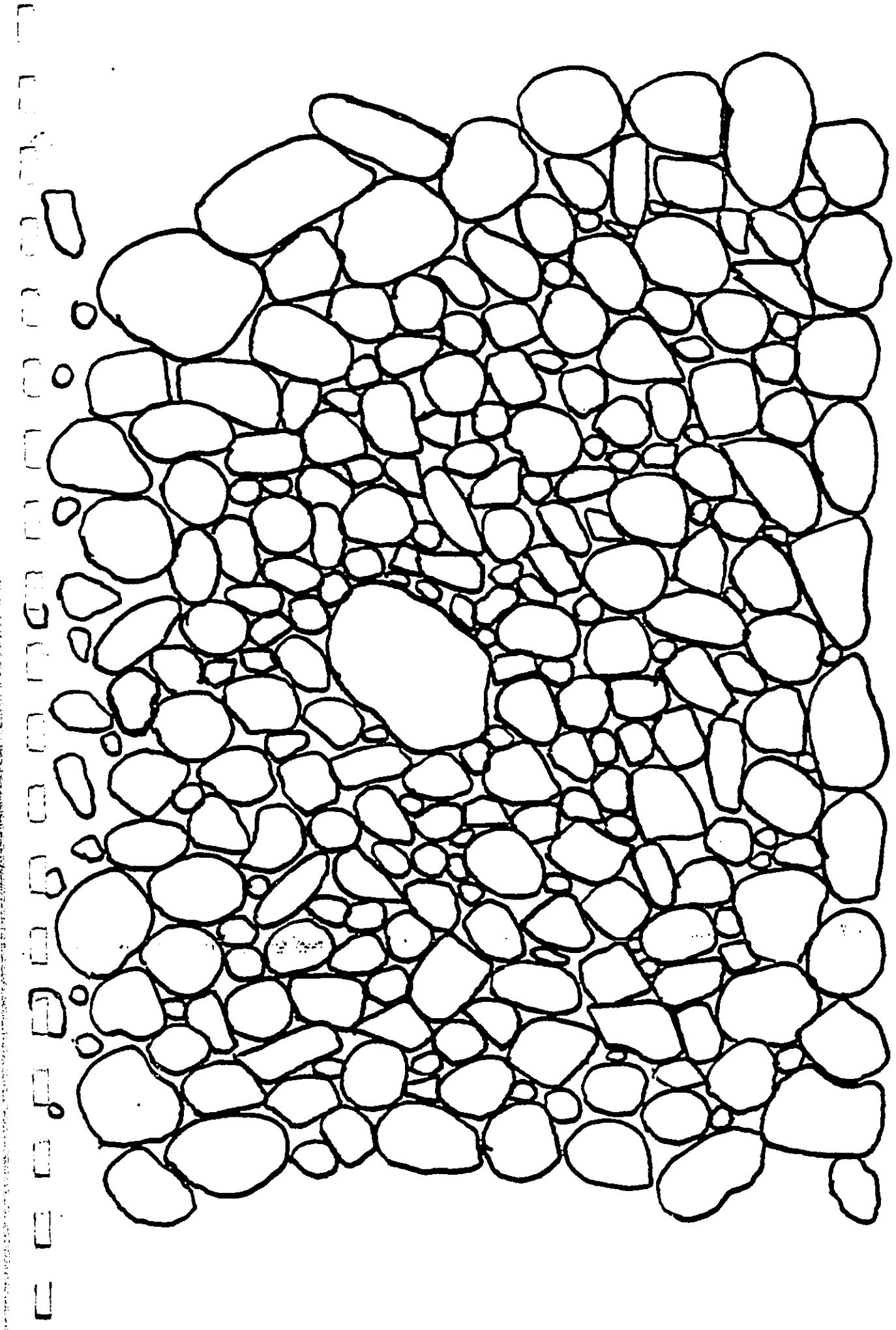
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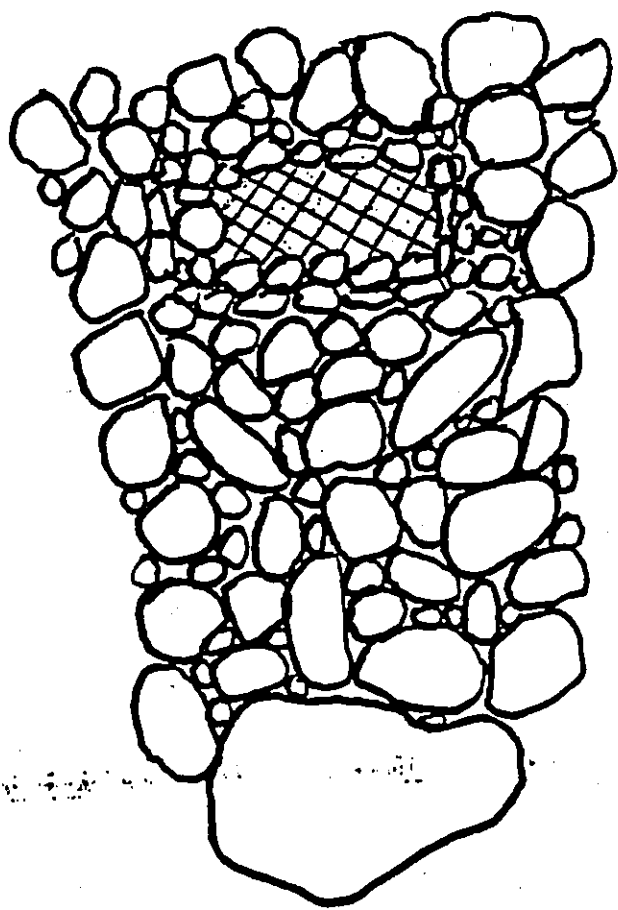
ACH-HK-111





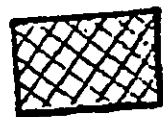
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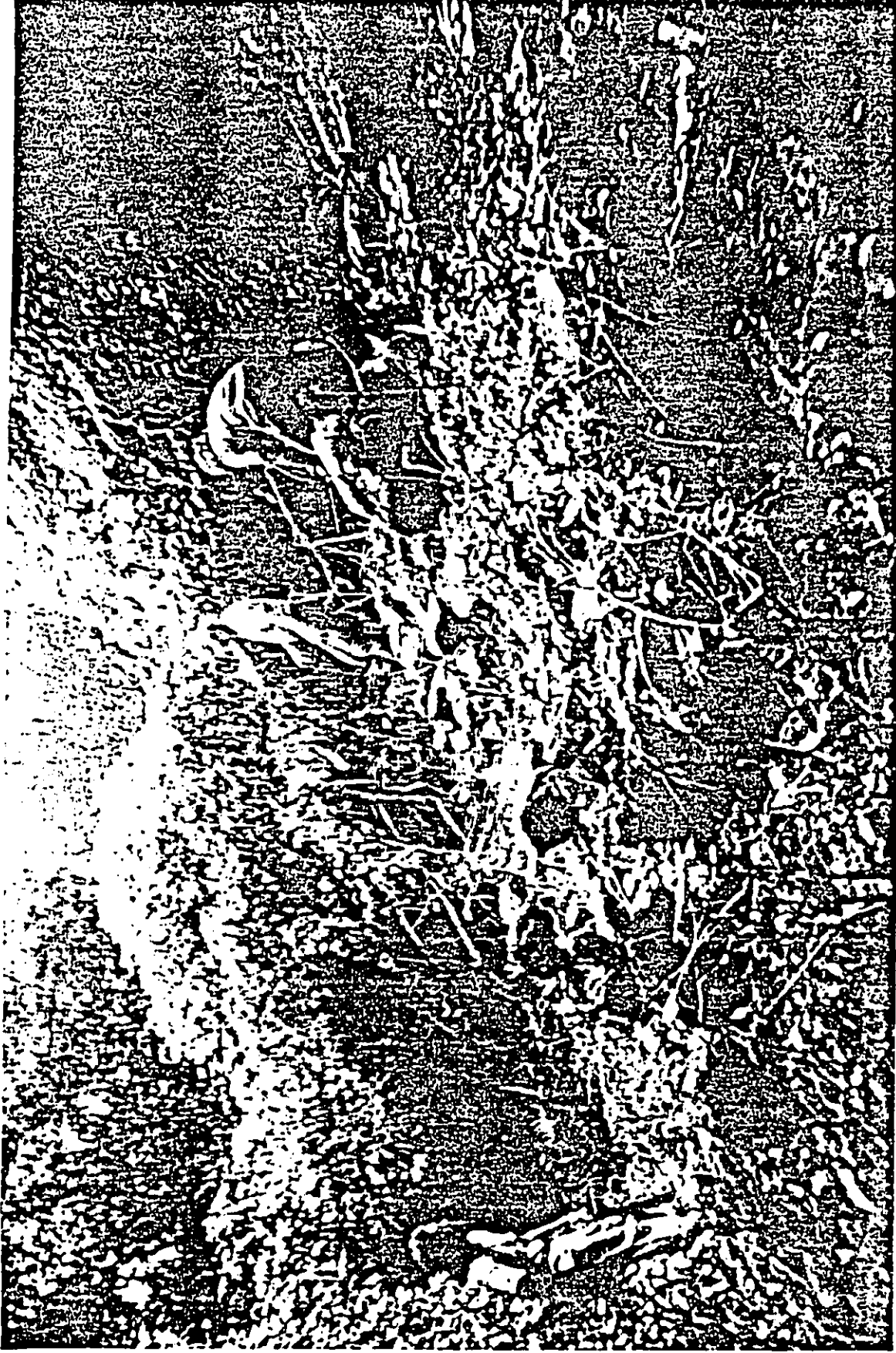


ACH-HK-V

1 METER



DEPRESSION



FINAL CLEARING ON ACH-HK-IV

ARCHAEOLOGICAL CONSULTANTS OCTOBER 1982

APPENDIX D

AGRICULTURAL FEASIBILITY STUDY

FRANK S. SCOTT, JR., Ph.D.
AGRICULTURAL ECONOMIST
275 KAELEPULU DRIVE
KAILUA, HAWAII 96734

January 18, 1982

Cowell & Co., Inc.
Suite 1414, Hawaii Building
745 Fort Street
Honolulu, Hawaii 96813

Attention: Mr. William J. Dornbush
Vice President

Gentlemen:

Subject: Agricultural Feasibility, Various Lands at Heeia Kea,
Tax Map Key 4-6-16-32, Koolaupoko District,
Island of Oahu, State of Hawaii

This report investigates the feasibility of agricultural production on the 203.825 acres of land constituting the subject parcel, which is owned by Hawaiian Electric Company, Inc. under a lease and agreement-of-sale from Kamehameha Schools/Bishop Estate. A tax map locating the subject land parcel is shown in Exhibit 1 of this report. As shown in Exhibit 2, the subject land parcel is situated directly mauka of existing residential lots and includes topography ranging from fairly level and gently sloping on lower portions to steeply sloping on upper portions.

STATE LAND USE AND COUNTY ZONING CLASSIFICATIONS

Approximately 87 acres of land in the lower makai section of the property is zoned Residential (R-6). The land zoned Residential is classified Urban by the State Land Use Commission. The remaining portion, consisting of 117+ acres in the steeply sloping mauka section of the property is zoned Preservation (P-1). The land zoned Preservation is classified Conservation by the State Land Use Commission.

ALISH CLASSIFICATIONS

The Hawaii State Department of Agriculture ratings under the ALISH System (Agricultural Lands of Importance to the State of Hawaii) classifies about 46 acres of land in the central part of the property as Other Important Agricultural Land (Exhibit 3). About 25 acres of this area is located within the Residential (R-6) zone and the remaining 21 acres are within the Preservation (P-1) zone.

SOIL CLASSIFICATIONS

The subject land parcel contains six subseries of soils as classified by the U.S.D.A. Soil Conservation Service (SCS) as shown in Exhibit 4. Descriptions of these soils are as follows:

Ewa Silty Clay Loam, Moderately Shallow, 0 to 2 Percent Slopes (Ema)

This subseries of the Ewa series is located in a narrow strip of land bordering Kamehameha Highway on the Kaneohe (east) side of the property. Existing residential lots occupy most of this area. Only a small narrow portion of Tax Map Key 4-6-16-32 is located within this soil classification.

The topsoil consists of dark reddish-brown silty clay loam about 18 inches thick. The subsoil is dark reddish-brown and dark-red silty clay loam, with a subangular blocky structure, moderately shallow and varying in depth. The substratum consists of coral limestone at a depth below the surface of 20 to 50 inches. Both the topsoil and subsoil have a pH of neutral.

The available water capacity is 13 inches per foot in the topsoil and 1.4 inches per foot in the subsoil. Runoff is very slow and the erosion hazard is no more than slight. The SCS capability classification is IIs, if irrigated, with the moderate limitations due to texture and shallowness. The soil is classified as "1" for sugarcane, "1" for pineapple and "2" for pasture.

The University of Hawaii Land Study Bureau (LSB) classifies this soil as land type C8i, with irrigation. The soil is given an overall rating of C (on a scale of A to E) and the following selected crop productivity ratings: pineapple, e; vegetables, d; sugarcane, c; forage, c; grazing, c; and orchard, c.

Based on the above ratings, plus on-site inspection of the property, there is indication that this land type would provide a fair soil medium for orchards and truck crops. However, as discussed previously, only a small narrow strip of the subject parcel is located within this soil classification.

Mokuleia Clay Loam (Mt)

This subseries of the Mokuleia series occupies a narrow strip of land bordering the mauka side of the highway on the Kahuku (west) side of the property. The area containing this soil is almost entirely occupied by existing residential lots on the Kaneohe side and by a Hawaiian Electric Company baseyard on the Kahuku side. The topsoil consists of a very dark grayish-brown loam about 16 inches thick. The subsoil is a dark-brown to light-gray single grain or loamy sand of 34 to 48 inches in depth. The topsoil is neutral and the subsoil is moderately alkaline.

The available water capacity is 1.8 inches per foot in the topsoil and 1.0 inch per foot in the subsoil. Permeability is moderate in the topsoil and rapid in the subsoil. Runoff is slow and the erosion hazard is no more than slight. Roots may penetrate to a depth of 5 feet or more. The overall SCS capability classification is IIs, if irrigated. This soil is classified as Group "1" for sugarcane and Group "3" for pasture.

The LSB classifies this subseries as the same land type as Ewa silty clay loam (EmA), which gives it an overall rating of C and the following selected crop productivity ratings: pineapple, e; vegetables, d; sugarcane, c; forage, c; grazing, c; and orchard, c. Interpretation of the above information, supplemented with on-site inspection, indicates that this land type is fair for orchards and truck crops.

Kokokahi Clay, 6 to 12 Percent Slopes (KtC)

A small pocket of this subseries of the Kokokahi series is located along the highway in the extreme makai-Kahuku corner of the project. Most of this soil type is located in the existing residential area just mauka of the highway. The topsoil consists of very dark gray and dark gray clay about 14 inches thick. The subsoil is a dark grayish-brown clay with a subangular blocky structure and is about 12 inches thick. The substratum is a grayish-brown and light brownish-gray clay, 14 to 20 inches thick. The topsoil is slightly acid to neutral and the subsoil and substratum are slightly acid to mildly alkaline.

The available water capacity is about 1.6 inches per foot at all levels. Runoff is medium and the erosion hazard is slight to moderate. Roots may penetrate to a depth of 5 feet or more. The soil has a high shrink-swell potential. Workability is difficult because of the sticky, plastic nature of the clay and because of the resulting narrow range of moisture content. The soil has a low SCS capability classification of VI_s, because of unfavorable texture. It is classified as "3" for pasture, but is not considered satisfactory for cultivated crop production.

Lahaina Silty Clay, 7 to 15 Percent Slope (LaC)

This subseries of the Lahaina series occupies about 50 percent of the approximately 87-acre area of undeveloped land currently zoned Residential (R-6). This area extends mauka from the highway on the Kaneohe-side and from the strips of land designated EmA at the central-makai border and Mt at the makai-Kahuku border. The topsoil consists of dark reddish-brown silty clay about 15 inches thick. The subsoil is a dusky-red and dark reddish-brown, subangular blocky silty clay and silty clay loam about 45 inches thick. The substratum is soft, weathered basic igneous rock. The topsoil is medium acid and the subsoil is slightly acid to medium acid.

The available water capacity is about 1.3 inches per foot in the topsoil and 1.4 inches per foot in the subsoil. Permeability is moderate. Runoff is medium and the erosion hazard is moderate. This subseries includes some steep areas and areas with a few stones on the surface. Roots may penetrate to a depth of 5 feet or more. The overall SCS capability classification is III_e, irrigated or non-irrigated. The downgrading is because of the erosion hazard when cultivated and not protected. Individual crop ratings are: sugarcane, "1"; pineapple, "3"; pasture, "3"; and woodland, "1".

The LSB classifies this land type as C54i and gives it an overall rating of C, with irrigation. Selected crop productivity ratings are: pineapple, e; vegetables, b; sugarcane, b; forage, b; grazing, c; and orchards, c.

The above ratings, plus on-site observation, indicate that this soil would provide a good medium for the production of bananas and truck crops, with proper cultural methods for preventing erosion.

Alaeloa Silty Clay, 15 to 35 Percent Slopes (AeE)

This subseries of the Alaeloa series is located mostly in the makai section of the area zoned Conservation but also occupies the mauka fringes of the segment zoned Residential.

The topsoil consists of dark reddish-brown silty clay about 10 inches thick. The subsoil is dark red and red silty clay with a subangular blocky structure and about 48 inches thick. The substratum is soft, weathered basic igneous rock. The topsoil is medium acid and the subsoil is strongly acid.

The available water capacity is about 1.2 inches per foot in the topsoil and 1.6 inches per foot in the subsoil. Permeability is moderately rapid, runoff is medium and the erosion hazard is moderate. Roots may penetrate to a depth of 5 feet or more in some areas. Workability is difficult because of the slope.

The SCS gives this soil a very low overall capability classification of VIe because the erosion hazard severity limits use for agriculture. The individual group ratings are: pineapple, "5"; pasture, "6"; and woodland, "5". Bananas and other orchard crops could be grown in areas of 15 to 20 percent slope, with terracing. Banana production would not be feasible on the steeper slopes of this subseries. The steep slopes and erosion problems would make the production of truck crops marginal, with contour farming and terracing, on slopes of 15 to 20 percent and infeasible on slopes in excess of 20 percent.

Alaeloa Silty Clay, 40 to 70 Percent Slopes (ALF)

This subseries is located entirely on land zoned as Conservation on the upper slopes of the project. This soil is the same as Alaeloa silty clay soil of lesser slope, except that runoff is rapid to very rapid and the erosion hazard is severe. The SCS overall capability classification is VIIe and individual group ratings are: pasture, "6"; and woodland, "15". Cultivated crop production is not feasible on this land type.

CRITERIA FOR AGRICULTURAL FEASIBILITY

Determination of the feasibility of agricultural production for specified land areas is generally based primarily on five criteria, consisting of: (1) ecological adaptation, (2) market or sales potential, (3) profitability, (4) comparative production advantage in relation to competing areas, and (5) intensity of production as determined by the magnitude of net income per acre. The only crops which meet the five criteria for commercial production of any importance on Oahu are a limited number of orchard crops, truck crops and flowers and foliage.

Extensive type crop production, requiring economy of scale and providing a low net income per acre, would not be feasible for small farm production in the project area. Crops falling into this category are alfalfa, field corn, pineapple and pasture. Lack of large markets, transportation costs and high labor costs limit expansion in production of most fruits and vegetables on Oahu.

APPLICATION TO PROJECT AREA

The next step in determining the agricultural feasibility of the project area is to evaluate the ecological adaptability to the project area of those crops or enterprises which meet all other feasibility criteria for production on Oahu. The following analysis applies this procedure to each of the previously identified SCS land types as shown in Exhibit 4.

The determination of agricultural feasibility for soil types EmA, Mt and KtC, which stretch along the mauka boundary of Kamehameha Highway, is not pertinent to this analysis since these areas are currently occupied by approved residential lots and the Hawaiian Electric Company baseyard.

An estimated 40 to 45 acres in the makai section of the area zoned Residential (R-6), consisting of Lahaina silty clay with 7 to 15 percent slopes (LaC), are given a fair overall rating by the SCS of IIIe for crop production, with the moderate downgrading due to the potential erosion hazard. The LSB gives this area an equivalent overall productivity rating of "C" and selected crop productivity ratings of "b" for vegetables and "c" for orchards. This information, supplemented with on-site inspection and familiarity with crop production in similar areas, indicates that orchard crops and truck crops could be grown successfully in this area, with contour farming and minimal terracing to control erosion. Drainage is good, root penetration is ample, the soil texture permits good workability, and the pH is not a deterrent. Kona winds would probably pose less of a problem than for other areas on Oahu, but this area is vulnerable to strong trade winds and crop damage could result both from wind force and from salt air. This is not an appropriate area for shadehouse production of potted flowers and foliage plants because of the terracing required to level the land.

The area consisting of Alaeloa silty clay of 15 to 35 percent slopes (AeE), which extends up the hillside from the Lahaina silty clay, is marginal for the production of truck and orchard crops in areas with slopes of 15 to 20 percent and not recommended for crop production in areas with slopes of 20 percent or over. The overall assessment is that this is not an appropriate area for the production of truck and orchard crops. It is also unsatisfactory for shadehouse production of potted flowers and foliage, since extensive terracing would be required.

Alaeloa silty clay soils of 40 to 70 percent slopes (ALF) in the upper mauka section of the project are not feasible for crop production.

CONCLUSIONS

None of the land types in the project area are ecologically well suited to the production of crops which meet all other criteria for the feasibility of agricultural production on Oahu. All land types except Lahaina silty clay of 7 to 15 percent slopes are either infeasible for crop production or are approved for uses other than agriculture. The Lahaina silty clay area, consisting of approximately 40 to 45 acres, is determined to be fair to good for the production of orchard crops (primarily bananas and papayas) and fair for the production of truck crops, with contour farming to prevent erosion. Shadehouse production of potted flowers and foliage is not recommended for this area because of the costly terracing which would be necessary to provide the required level strips of land.

The project area does not consist of prime agricultural land. The estimated 40 to 45 acres of the entire area which are considered adaptable to agricultural production are only marginally suitable. This small area, furthermore, has the disadvantage of being a narrow strip of land which is wedged in between existing residential lots and on existing Hawaiian Electric Company baseyard fronting Kamehameha Highway on the lower makai side and steep slopes with severe erosion hazards on the upper mauka side.

The acreage of prime agricultural land on Oahu far exceeds the amount which would be needed for intensive crop production in the foreseeable future. Lands which are better adapted to agricultural production than those in the project area should receive priority in development to satisfy future demand for increased crop production.

In addition to ecological limitations for agricultural production, the project would have serious comparative disadvantages in cost of production, not only because of the higher costs of producing crops on lands of moderately steep slopes, but also because the project area would be dependent upon water provided by the City and County of Honolulu at a rate of 62 cents per 1,000 gallons for agricultural use as compared to 25 cents or less per 1,000 gallons in areas of Oahu where adequate ground surface water resources can be developed within the project areas.

In summary, the foregoing analysis indicates that agricultural production does not constitute an appropriate potential use of lands in the project area.

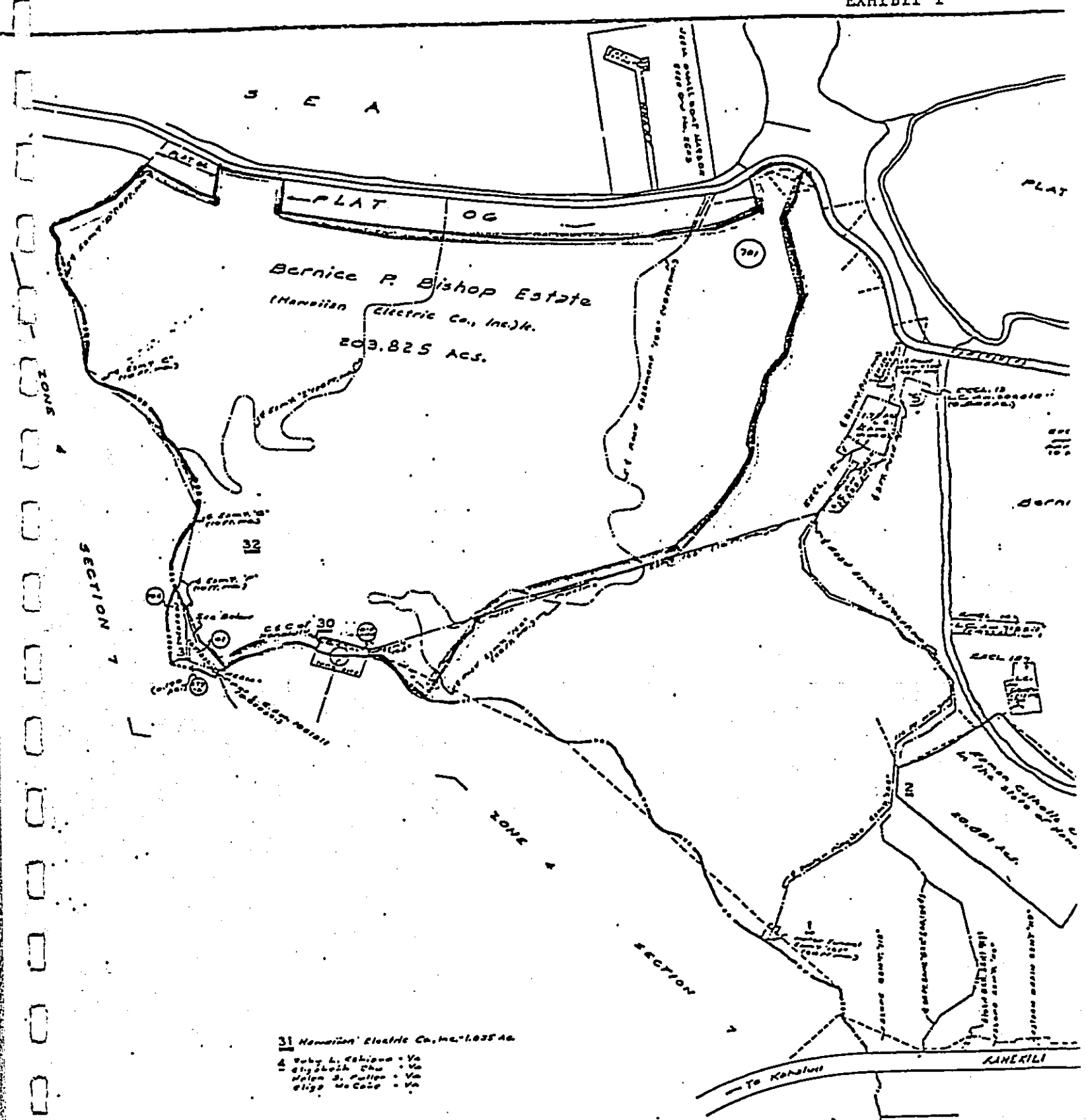
Sincerely,

Frank S. Scott, Jr.

Frank S. Scott, Jr., Ph.D.
Agricultural Economist

Enclosures:

- Exhibit 1 - Tax Map Locating Subject Property
- Exhibit 2 - Topographical Map Locating Subject Property
- Exhibit 3 - Agricultural Land Rating Map
- Exhibit 4 - Soil Classification Map
- Curriculum Vitae - Frank S. Scott, Jr., Ph.D.



31 Hawaiian Electric Co., Inc. - 1,035 AC.
 4 Ruby L. Bishop - Va
 Elizabeth Chu - Va
 Helen S. Pullen - Va
 Eliza McCall - Va

10 Dionicio Lohatad - Ha
 Pedro V. Lohatad - Ha
 12 William O. Lohatad Estate
 13 Thomas A. Tamis - 3/3
 Walter T. Lohatad - 3/3

14 & 15 Rufina A. Peterson &
 and Josephine E. - 7/4

15 Epiphanie T. Bishop
 17 Pio Sanchay and
 Yvonne - 7/2

DEPARTMENT OF REVENUE
 PROPERTY ASSESSMENT DIVISION
 TAX MAPS BRANCH
 STATE OF HAWAII
 TAX MAP

FIRST TAXATION DIVISION		
ZONE	SEC	PLAT
4	6	16

SCALE: 1 IN. = 400 FT.

POR. HEEIA, KOOLAPOKO, OAHU. por. LAND COURT APPLICATION 1100.

TOPOGRAPHICAL MAP
Locating Subject Parcel

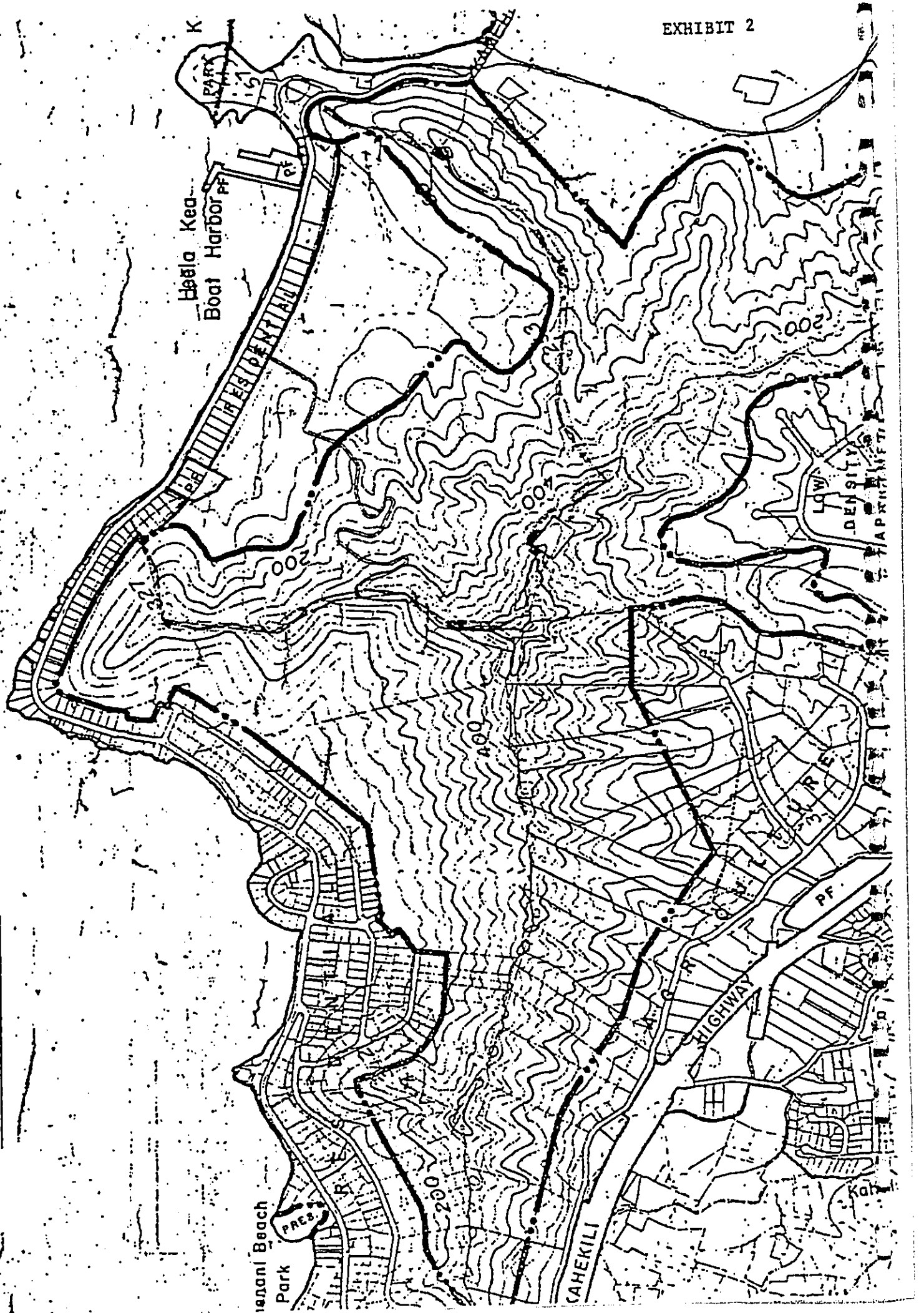
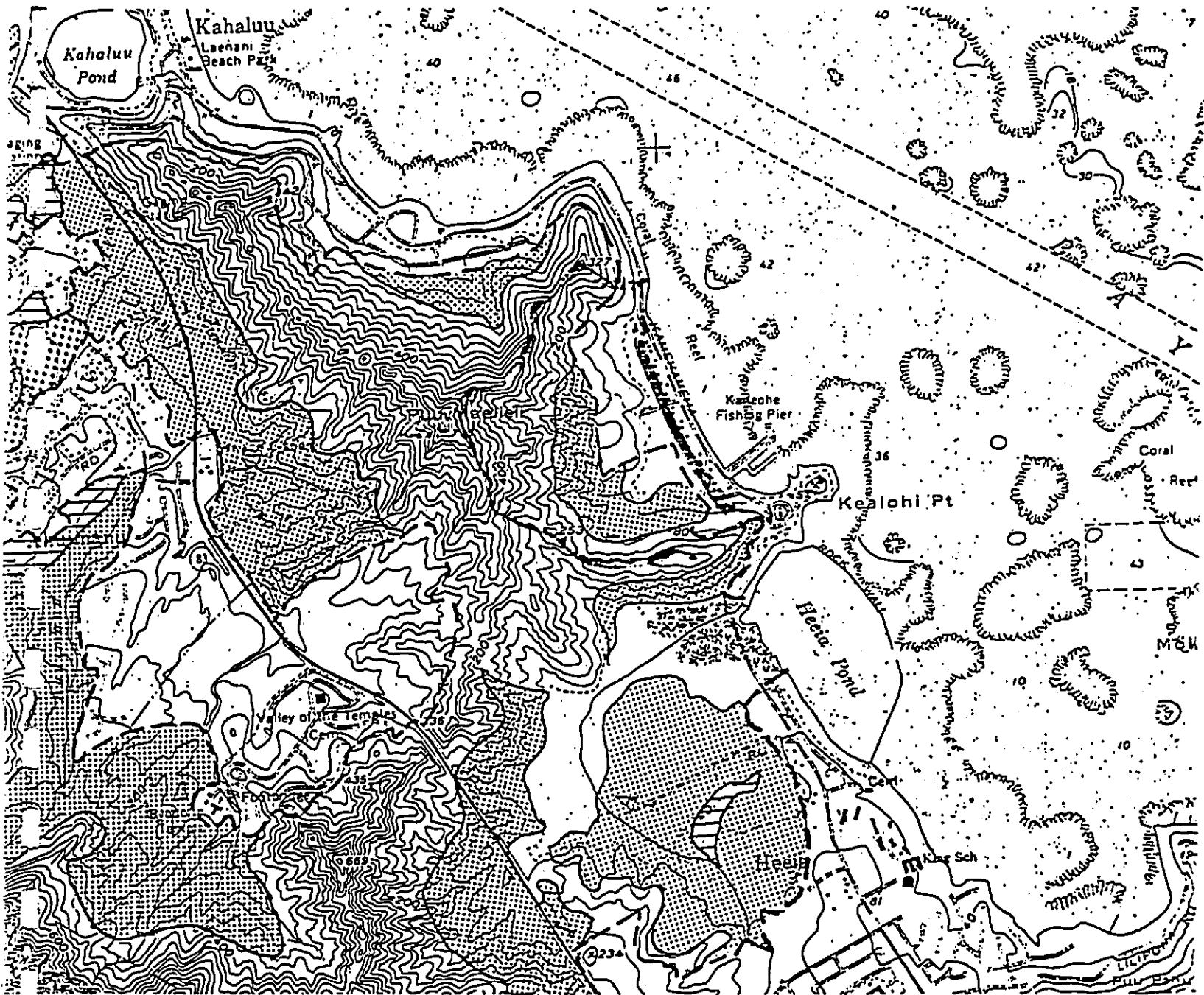
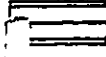


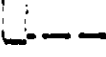



EXHIBIT 3



LEGEND:

-  **PRIME AGRICULTURAL LAND** - Land which has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods.
-  **UNIQUE AGRICULTURAL LAND** - Land that has the special combination of soil quality, location, growing season, moisture supply, and is used to produce sustained high quality and or high yields of a specific crop when treated and managed according to modern farming methods.
-  **OTHER IMPORTANT AGRICULTURAL LAND** - Land other than Prime or Unique Agricultural Land that is also of state-wide or local importance for agricultural use.
-  **EXISTING URBAN DEVELOPMENT** - Land which has been developed for urban type use.
-  **U.S. GOVERNMENT** - Land which is currently under the jurisdiction of the U.S. Government.

Ratings of Lands at Heeia-Kea, Tax Map Key 4-16-16-32, Under Agricultural Lands of Importance to the State of Hawaii, Department of Agriculture, State of Hawaii, 1977.



Scale: 1 inch = 2,000 feet

Soil Classifications of Lands of the Hawaiian Electric Company
Property at Heeia-Kea by the USDA Soil Conservation Service.

CURRICULUM VITAE

Frank S. Scott, Jr.

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Telephone: (808) 948-8420

Home Address: 275 Kaelepuku Drive, Kailua, Hawaii, 96734

Citizenship: USA Date of Birth: 3/5/21

Education

University of Illinois, Urbana, 1948-51, Ph.D. 1953.
Major: Resource Economics

University of Missouri, Columbia, 1946-47, M.A. 1947.
Major: Marketing of Agricultural Products

Oregon State University, Corvallis, 1942-43, B.S. 1944.
Major: Animal Science, Minor: Agricultural Economics

University of Wyoming, Laramie, 1939-41.
Major: Animal Science

Language Proficiency

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>	<u>Understanding</u>
English	Excellent	Excellent	Excellent	Excellent
Spanish	Good	Good	Good	Good
Portuguese	--	Fair	--	Fair
French	--	Fair	Fair	Fair
German	--	Fair	Fair	Fair

Special Areas of Competence

1. Market potentials and market development
2. Feasibility of resource development
3. Agricultural economic development
4. Economic feasibility of tropical crops

Employment, University

Professor, Department of Agricultural and Resource Economics, University of Hawaii, 1959 to date (Chairman of Department, 1960, 1964, 1971-1980)
(Chairman of Graduate Field in Agricultural Economics, 1959-60, 1962-67, 1970 to date).

Associate Professor, Department of Agricultural and Resource Economics, University of Hawaii, 1954-59.

Assistant Professor, Department of Agricultural Economics, University of Nevada, Reno, 1951-54.

Employment, University (continued)

Research Assistant, Department of Agricultural Economics, University of Illinois, 1950-51.

Assistant Professor of Agricultural Economics, Stephen F. Austin State University, 1948-50.

Foreign Assignments

Economist, Taleghani-Doftary Engineering Company, Tehran, Iran (Economic Feasibility, Mond-Shespir Reclamation Project), February-March, 1978.

Economist, FAO, Turrialba, Costa Rica (Economic Feasibility of a Macadamia Nut Industry in Costa Rica), June-August, 1975.

Research Economist, Hawaiian Agronomics, Moghan Regional Economic Development Project, Iran, February-May, 1971.

Marketing Advisor to Argentina, Texas A & M University-AID, Buenos Aires (Advisor to Instituto Nacional Technologica Agropecuaria in Buenos Aires and at provincial institutes, taught graduate courses in marketing and chaired M.S. committees as a member of the graduate faculty of Texas A & M University), September, 1967 - December, 1969.

Research Economist, Hawaiian Agronomics-AID (Mechanization and Modernization of the Sugar Industry in N.E. Brazil, Acting Chief of Party and co-author of report with Ernest Smith), November, 1965 - May, 1966.

Marketing Advisor to Argentina, FAO (taught graduate courses in marketing, advised researchers and established research and extension plans in marketing for 10 regional stations of Instituto Nacional Technologica Agropecuaria), December 1960-January, 1962.

Consulting Assignments

Agricultural Economic Feasibility for Kaluanui Ventures, Oahu, Hawaii, report submitted November, 1980.

Crop Feasibility - Mokuleia Homesteads, reports submitted in March and April, 1980.

Agricultural Feasibility and Environmental Impact - Waiahole Valley Agricultural Park, MSE Pacific, Honolulu, report submitted May, 1980.

Agricultural Feasibility and Environmental Impact, Keahole Agricultural Park, MSE Pacific, Honolulu, report submitted July, 1977.

Agricultural Feasibility, Waiahole Valley, Architects Hawaii, Honolulu, report submitted October, 1977.

FRANK S. SCOTT, JR.

Publications:

- "Hedging Cattle Feeding Operations" (with T.A. Hieronymus and W.J. Wills). Illinois Farm Economics 200:1272-1276. January, 1952.
- "Criteria for Multiple-Purpose Development of Small River Basins with Particular Reference to Irrigation." Proceedings of the Committee on the Economics of Water Resource Development of the Western Agricultural Economics Research Council, December, 1952.
- Ph.D. Dissertation (University of Illinois): An Economic Analysis of Irrigation Development of the Truckee-Carson River System (in Western Nevada), August 1953, 323 pp.
- "Institutional Arrangements in Water Resource Development." Proceedings of the Committee on the Economics of Water Resource Development of the Western Agricultural Economics Research Council. pp. 39-42, June, 1954.
- "Some Weaknesses in the Use of Imputed Values for Unpaid Family Labor and Family Living Allowances in Determining Payment Capacity." Journal of Farm Economics 36 (3): 526-529. August, 1954.
- "Estimating Cattle on Feed." Journal of Farm Economics 37 (1): 127-129. February, 1955.
- "Cattle Finishing, A Fast Growing Industry in the Western States" (with Harold Abel). The Agricultural Situation 39 (6):5, 6. June, 1955.
- "The Mainland Market for Frozen Passion Fruit Juice." Hawaii Farm Science 4 (1). July, 1955.
- "Sugar Ratios and Dilution Preferences for Frozen Passion Fruit Juice." Department of Agricultural Economics, Hawaii Agricultural Experiment Station. December, 1955. 2 pp. (mimeo.)
- "Marketing Aspects of Western Cattle Finishing Operations." Bulletin 190, a Western Regional Research Publication, Nevada Agricultural Experiment Station in cooperation with Agricultural Experiment Stations of the Western States and U.S. Department of Agriculture. December, 1955. 68 pp.
- "Frozen Passion Fruit Juice--An Appraisal of the Mainland Market Potential." HAES, Agricultural Economics Report 25, December, 1955. 21 pp.
- "Western Cattle Finishing, An Expanding Outlet for Mixed Feeds." Feed Age 6 (1):49. January, 1956.
- "The Test City Approach as a Means of Measuring Market Potentials for New Hawaiian Products." Paper presented at the meeting of the Hawaii Chapter of the American Statistical Association, Honolulu, Hawaii, October, 1956.

- "The Mainland Passion Fruit Market." Hawaii Farmer 9(56):12, 13. October, 1956.
- "Passion Fruit Marketing." Hawaii Farmer 9(56):18-20. November, 1956.
- "Consumer Preferences for Frozen Passion Fruit Juice." HAES, Agricultural Economics Report 29, December, 1956. 14 pp.
- "Cattle Finishing in Nevada." Bulletin 193, Nevada Agricultural Experiment Station. 1957. 24 pp.
- "Methods and Costs of Developing the Mainland Market for Frozen Passion Fruit Juice." Department of Agricultural Economics, Hawaii Agricultural Experiment Station, May, 1957. 5 pp. (mimeo.)
- "Consumer Uses of Passion Fruit Juice--A Guide to Market Development." HAES, Agricultural Economics Report 31, July, 1957.
- "Criteria for Estimating Market Potentials of New Hawaiian Horticultural Products." Paper presented at the meeting of the Hawaiian Academy of Science, Honolulu, Hawaii, November 7-8, 1957.
- "Manipulation of Market Demand in Market Development Research." Proceedings of the Marketing Research Committee of the Western Agricultural Economics Research Council, Reno, Nevada, December 2-6, 1957.
- "A Review of Passion Fruit Marketing." Hawaii Farm Science 6(3):2, 3. January, 1958.
- "An Analysis of Market Development for Frozen Passion Fruit Juice." HAES, Agricultural Economics Bulletin 11, June, 1958. 39 pp.
- "Commercial Uses and Consumer Preferences for Hawaiian Guava Products--A Guide to Market Development." HAES, Agricultural Economics Bulletin 13, August, 1958. 15 pp.
- "An Economic Analysis of the Market for Frozen Guava Nectar Base--Buying Patterns and Potential Sales." HAES, Agricultural Economics Bulletin 14, September, 1958. 21 pp.
- "Characteristics of Consumer Demand for Macadamia Nuts." HAES, Agricultural Economics Bulletin 16, October, 1958. 39 pp.
- "Observations on the Market for Macadamia Nuts." Hawaii Farm Science 7(2):5, 6. October, 1958.
- "Developing the Market Potential--How New Fruit Products Can Be Introduced and Consumer Demand Created and Measured." Hawaii Agriculture 13(6):35-37.
- "Developing the Market Potential--Island Fruit and Nut Products Need Well Planned Promotion." Hawaii Agriculture 14(1):23-25. January, 1959.

- "Seasonality of Purchases of Frozen Orange Juice Concentrate, Frozen Lemonade Base, and Frozen Passion Fruit Juice." Hawaii Farm Science 7(3):4, 5. January, 1959.
- "Some Indications of Consumer Preferences for Bananas," (with Henry T.S. Lau) Hawaii Farm Science 7(4):4-6. Apr-1, 1959.
- "An Economic Analysis of Passion Fruit Juice Processing--Models of Costs and Returns." HAES, Agricultural Economics Bulletin 18, April, 1959. 51 pp.
- "Observations on the Market for Macadamia Nuts." California Macadamia Nut Society Yearbook, 1959. Volume V, pp. 79-83.
- "Consumer Demand for Milk in Honolulu and Kailua." HAES, Agricultural Economics Report No. 41, April, 1960. 38 pp.
- "Some Uses and Limitations of Controlled Experiments in Marketing Research." Proceedings of the Marketing Research Committee of the Western Agricultural Economics Research Council, November 14-16, 1960. pp. 53-63.
- "El Mercado Brasileo Para Las Manzanas Argentinas (with Mario P.F. Rossini). Instituto Nacional de Tecnologia Agropecuaria--Centro Regional Rionegrense Boletin de divulgacion tecnica No. 2, December, 1961. 11 pp.
- Investigacion Y Capacitacion en mercadeo Agricolo-Informe 21, Gobierno de la Republica Argentina, FAO, Naciones Unidas, Roma, 1962, 31 pp.
- "Progress in Marketing Research on Macadamia Nuts." Proceedings of the Hawaii Macadamia Producers Association, Second Annual Conference, May 12, 1962.
- "Sales Potentials and Methods and Costs of Market Development for Macadamia Nuts," presented at the January 31, 1963, conference on macadamia nuts sponsored by the trade committee, Honolulu Chamber of Commerce, and the Hawaii Macadamia Producers Association.
- "The Implication of Market Development and Promotion Schemes on Producer Returns and Consumer Welfare." Proceedings of the Workshop-Seminar on Market Development and Promotion for Agricultural Products, Economic Research Service, USDA Report 274; 21-26, May, 1966..
- "Diversification and Modernization of Agriculture in the Sugar Cane Zone of Northeast Brazil." (Joint editor with Ernest A. Smith.) November, 1966, 315 pp. Also author of Chapter 10, "Diversified Crops" (with Frank S. Twitty), 74 pp. in same publication.
- Transition in Consumer Demand for Milk in Honolulu and Kailua, Agricultural Economics Bulletin No. 25, University of Hawaii Agricultural Experiment Station, January, 1967.
- Characteristics of Consumer Demand for Shell Eggs in Metropolitan Honolulu, (with P. K. Lim) Agricultural Economics Bulletin No. 26, University of Hawaii Agricultural Experiment Station, January, 1968.

The Market for Macadamia Nuts--An Economic Analysis, Agricultural Economics Report No. 82, University of Hawaii Agricultural Experiment Station, January, 1969.

A Re-Evaluation of the Market for Macadamia Nuts, (with Muhammad Chaudhary), paper presented at the 10th Annual Meeting of the Hawaii Macadamia Producers Association, May 2, 1970.

Reconsideracion de Las Necesidades de Investigacion Y de Los Requerimientos de Personal en el Servicio de Economia de Inta (A Re-Examination of Research Needs and Staffing Requirements in the Agricultural Economics Service of the Instituto Nacional de Tecnologia Agropecuaria), published in 1970 by the Instituto Nacional de Tecnologia Agropecuaria, Buenos Aires, Argentina, 61 pp.

Reconnaissance Survey for Developing a Plan of Economic Development for the Moghan Region (author of Chapters on Economic Feasibility), Secretariat of Agriculture, Government of Iran, July, 1971.

A Current Evaluation of the Market for Macadamia Nuts, (with M.A. Chaudhary), Hawaii Farm Science 20(1):10-11, January, 1971.

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APPENDIX E

AIR QUALITY ANALYSIS

TRAFFIC RELATED
AIR QUALITY ANALYSIS
FOR THE PROPOSED
HEEIA KEA SUBDIVISION
KANEHOHE, HAWAII

Prepared By

Barry D. Root
Kaneohe, Hawaii

November 21, 1982

INDIRECT AIR QUALITY IMPACT OF INCREASED TRAFFIC

Once construction is completed the proposed project will not in itself constitute a significant direct source of air pollutants other than minor air conditioner losses and fugitive cooking aromas. By serving as an attraction for increased motor vehicle traffic in the area, however, the project must be considered to be an indirect air pollution source.

Motor vehicles, especially those with gasoline-powered engines, are prodigious emitters of carbon monoxide. They also produce significant quantities of hydrocarbons and nitrogen oxides. Those burning fuel which contains lead as an additive also contribute some lead particles to the atmosphere. The major control measure designed to limit lead emissions is a Federal law requiring the use of unleaded fuel in most new automobiles. As older cars are removed from the vehicle fleet lead emissions should continue to fall. Federal control regulations also call for increased efficiency in removing carbon monoxide, hydrocarbons and nitrogen dioxide from vehicle exhausts. By 1995 carbon monoxide emissions from the vehicle fleet then operating are mandated to be about half the amounts now emitted.

In order to evaluate the air quality impact of increased traffic and decreasing emission levels per vehicle in the project

area a detailed carbon monoxide modeling study has been carried out. This study was designed to yield carbon monoxide concentration values which could be directly compared to State and Federal Air Quality Standards.

CARBON MONOXIDE DIFFUSION MODELING

Three critical receptor sites were selected for analysis: site 1 on the makai side of Kamehameha Highway across from proposed intersection A at a picnic table area within the Heeia Kea small boat harbor; and sites 2 and 3 on the mauka side of Kamehameha Highway near proposed intersections A and B respectively. The locations of these three sites are indicated on Figure 1. Expected worst case concentrations of carbon monoxide at these receptor points was computed as described below for the present case and for future years with and without the proposed project.

At present highest daily peak hour traffic volumes occur on Kamehameha Highway between 0615 and 0715 HST. A peak hour traffic count conducted by the consultant on Thursday, October 7, 1982, during the morning rush hour yielded 601 vehicles in the Kaneohe bound lane and 86 vehicles in the Kahuku bound lane of Kamehameha Highway at the entrance to the Heeia Kea small boat harbor across from proposed intersection A. Of these vehicles a total of 27 turned into the small boat harbor; only 3 came out.

When completed, the proposed project is expected to add 310 vehicles to the peak hour volume on Kamehameha Highway. Of these 188 vehicles are expected to utilize intersection A, 108 to use intersection B, and only 14 to use intersection C. Projected

turning movements are described in the traffic study for the project.

By the year 2002 (20 years after project commencement) existing peak hour traffic volumes on Kamehameha highway at a location just south of the Heeia Kea small boat harbor are expected to grow from the present level of 687 to about 790. Traffic from the proposed project would increase this projection to 975 in 1992 and 1015 in 2002.

Based on the October 7 peak hour vehicle count and standard assumptions regarding fuel usage the existing vehicle mix on Kamehameha Highway adjacent to the project site is as follows: 75% gasoline-powered automobiles, 20% light duty gasoline-powered trucks and vans, 0.8% heavy duty gasoline powered vehicles, 0.4% diesel-powered automobiles, 0.2% diesel-powered light duty trucks, 3% diesel-powered heavy duty trucks and buses, and 0.6% motorcycles. This mix is not expected to change significantly over the years studied. Project related traffic is expected to be 90% gasoline-powered automobiles, 1.3% diesel-powered automobiles, 8.5% gasoline-powered light duty trucks and vans, and 0.2% diesel-powered light duty trucks.

It is assumed that no traffic controls other than stop signs will be employed at any of the proposed project intersections. Special turn and storage lanes will be constructed on Kamehameha

Highway at intersections A and B to help prevent traffic congestion at these locations as described in the traffic study for the project.

Average vehicle speeds on project access roads upstream from stop signs is assumed to be 5 mph, while right turn traffic in and out of the project is assumed to travel at 15 mph. Vehicles in the left turn storage lanes on Kamehameha Highway are assumed to move at an average rate of 5 mph, while traffic in unimpeded flow moves along at 35 mph. All vehicles leaving the project and 20% of the vehicles on Kamehameha Highway are assumed to be operating in the cold start mode.

Vehicular carbon monoxide emission rates for the years studied were determined using the latest version of EPA's computerized Mobile Source Emissions Model (MOBILE 2). Morning rush hour temperature was assumed to be 68°F.

The EPA computer model HIWAY-2 was used to calculate carbon monoxide concentrations at selected receptor sites with and without project-related traffic. Stability category E (5) was used for determining diffusion coefficients. This stability category represents the most stable (least favorable) atmospheric condition that is likely to exist in a rural area such as this.

To simulate worst case wind conditions a uniform wind speed of one meter per second was assumed with the worst case wind for

site 1 being a rather rare north northwest wind, while that at sites 2 and 3 a much more frequent northeast tradewind.

At each receptor site concentrations were computed at a height of 1.5 meters to simulate levels that would exist at within the normal human breathing zone.

Background contributions of carbon monoxide from sources or distant roadways not directly considered in the analysis were assumed to be about 0.5 milligrams per cubic meter (mg/m^3) in 1982, and 0.4 mg/m^3 in 1992 and 2002. The decrease in background level for future years reflects the expected increase in emission control effectiveness for the vehicle fleet that is operating in those years.

Results of the peak hour carbon monoxide analysis are presented in Table 2. Concentrations of carbon monoxide are predicted to be within State and Federal AQS with or without the proposed project at all three selected critical receptor sites even under the worst case traffic and meteorological conditions considered in the diffusion modeling analysis.

Predicted worst case eight hour carbon monoxide concentrations at these same receptor sites are presented in Table 3. These values are based on the results for the peak hour analysis as modified by the application of a 'meteorological

persistence factor' of 0.6 as recommended in EPA guidelines to account for the fact that meteorological dispersion conditions are likely to be more variable (and hence more favorable) over an eight hour period than they are for a one hour period. Once again the projected concentrations are well within Federal and State AQS.

TABLE 2

RESULTS OF PEAK HOUR CARBON MONOXIDE ANALYSIS
(milligrams per cubic meter)

SITE	CONFIGURATION	1982	1992	2002	STATE OF HAWAII AQS	FEDERAL AQS
1	WITHOUT PROJECT	1.5	1.0	1.0	10	40
	WITH PROJECT		2.2	2.0		
2	WITHOUT PROJECT	1.0	0.7	0.7	10	40
	WITH PROJECT		1.4	1.3		
3	WITHOUT PROJECT	1.0	0.7	0.7	10	40
	WITH PROJECT		0.8	0.8		

TABLE 3

RESULTS OF EIGHT HOUR CARBON MONOXIDE ANALYSIS
(milligrams per cubic meter)

SITE	CONFIGURATION	1982	1992	2002	STATE OF HAWAII AQS	FEDERAL AQS
1	WITHOUT PROJECT	0.9	0.6	0.6	5	10
	WITH PROJECT		1.3	1.2		
2	WITHOUT PROJECT	0.6	0.4	0.4	5	10
	WITH PROJECT		0.8	0.8		
3	WITHOUT PROJECT	0.6	0.4	0.4	5	10
	WITH PROJECT		0.5	0.5		

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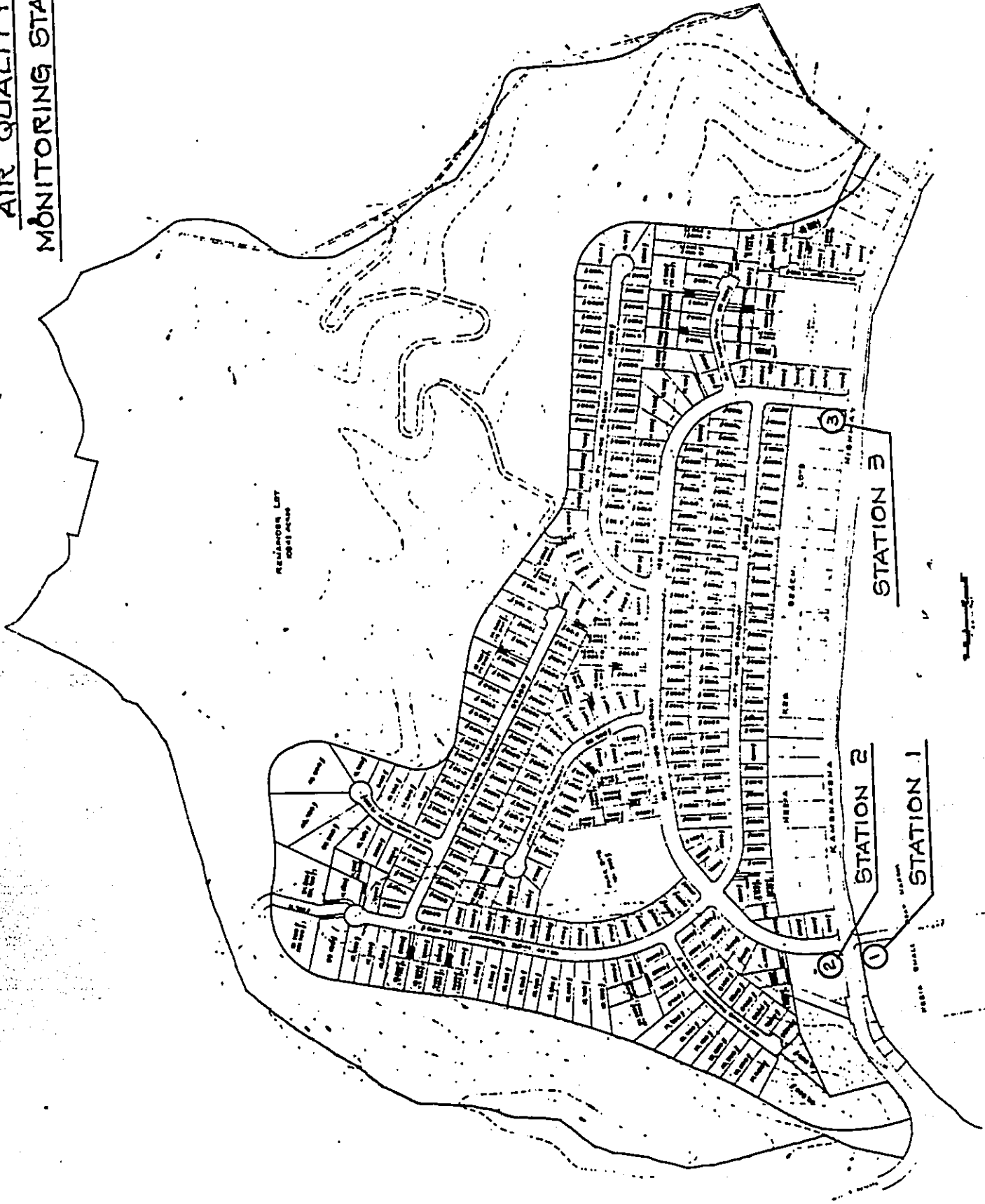
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TABLE 1
SUMMARY OF
STATE OF HAWAII AND FEDERAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	SAMPLING PERIOD	FEDERAL STANDARDS		STATE STANDARDS
		PRIMARY	SECONDARY	
1. Suspended particulate matter (micrograms per cubic meter)	Annual Geometric Mean	75	60	-
	Annual Arithmetic Mean	-	-	55
	Maximum Average in any 24 hours	260	150	100
2. Sulfur Dioxide (micrograms per cubic meter)	Annual Arithmetic Mean	80	-	20
	Maximum Average in any 24 hours	365	-	80
	Maximum Average in any 3 hours		1300	400
3. Carbon Monoxide (milligrams per cubic meter)	Maximum Average in any 8 hours		10	5
	Maximum Average in any 1 hour		40	10
4. Hydrocarbons Non-methane (micrograms per cubic meter)	Maximum Average in any 3 hours		160	100
5. Ozone (micrograms per cubic meter)	Maximum Average in any 1 hour		240	100
6. Nitrogen Dioxide (micrograms per cubic meter)	Annual Arithmetic Mean		100	70
	Maximum Average in any 24 hours		-	150
7. Airborne Lead (micrograms per cubic meter)	Average Over 3 Months		1.5	1.5

Source: 40 Code of Federal Regulations, Part 50 and State of Hawaii Public Health Rule and Regulations, Chapter 42.

FIGURE 1
AIR QUALITY
MONITORING STATIONS



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APPENDIX F

FLORA REPORT

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REPORT ON THE VEGETATION AND FLORA OF THE PROPOSED HEEIA KEA
SUBDIVISION, TMK:4-6-16:32, HEEIA, KOOLAUPOKO, OAHU

This report is based on four visits to the site. An initial reconnaissance was made from Kamehameha Highway, the HECO Baseyard, and the Heeia Small Boat Harbor on February 6, 1982. This was followed up with walk-through surveys of the site made on Sept. 11, Nov. 13, and Nov. 27, 1982. During the walk-through surveys I attempted to make a complete list of the plants growing wild in the area. While I also recorded some of the more common and conspicuous plants cultivated around the houses, it was not possible to conduct a detailed survey in the vicinity of most of the houses. However, since the plants around the houses are either those intentionally cultivated or weedy species associated with them, they have little or nothing to do with the potential effects of the proposed project on the natural environment, and they are thus of little significance to the substance of this report. The report includes both a description of the vegetation types encountered, and a flora, or list of the plants found (Table 1).

The vegetation around the houses along the mauka side of Kamehameha Highway consists mostly of cultivated species such as mango, banana, banyan, false kamani, Norfolk pine, African tuliptree, monkeypod, kukui, papaya, ginger, and heliconia, plus a number of other cultivated shrubs and herbs and several weeds. Just mauka of the highway, in low places with standing water, are patches of American mangrove. It was in the area around the houses that the only two species of native Hawaiian plants

encountered during the survey were found in greatest number. These were the hala and the hau.

The relatively flat area behind the houses, and the lower slopes up to 100 to 150 feet elevation, are dominated by koa haole, growing in dense thickets from 10 to 30 feet high. Scattered trees such as monkeypod, coconut, Java plum, and kukui grow here and overtop the koa haole layer. The shade is fairly deep here and only a few herbs and small shrubs are found, but palmgrass and basketgrass are quite common. Throughout this area are signs of former houses and occasional remnants of cultivation such as ti and croton plants.

Above the koa haole zone, and extending to the mauka property line, the vegetation in many places, especially on ridges and slopes, is an open grassland dominated by such grasses as broomsedge, Californiagrass, molassesgrass, guineagrass, and dallisgrass, with lantana, Jamaica vervain, partridge pea, and Spanish clover. There are scattered shrubs or small trees of guava and Christmasberry, and trees of Java plum and ironwood. In some of the gulches the guava, Christmasberry, Java plum, and ironwood form small patches of closed forest.

Analysis of Table 1 shows that of the 68 species of higher plants recorded at this site, only two are native Hawaiian species and 66 are species introduced to Hawaii by man. The two native species, the hala and the hau, are thought to be indigenous, native across wide areas of the Pacific. No Hawaiian endemic plants, those native only to Hawaii, were encountered during this survey. Essentially all Hawaiian plants which are candidates for listing as endangered species are Hawaiian endemics.

None of the plant species found at Heeia Kea is either listed or currently a candidate for listing as an endangered species.

The lack of native species in the flora suggests that the area has been highly disturbed in the past by man and his activities. One local resident told us that the area had been used for pineapple cultivation until 1915, and the remnants of roads and houses mauka of the present-day houses suggests that the area was occupied even later than that.

The vegetation and flora are consistent with what one would expect to find in an area long ago cleared of native plants, which has since been abandoned or at least not actively cultivated for a few decades.

Based on my survey, and my experience in conducting botanical fieldwork in Hawaii since 1953, I think that it would be highly improbable that any rare or endangered species of native plant is now growing in the area. Consequently, my opinion is that the proposed subdivision development would be unlikely to have any significant adverse environmental effects on native plants or on ecosystems that are predominantly native in nature. The major adverse botanical effect of the proposed project could be the soil erosion that might occur following removal of the vegetation. If appropriate mitigating measures to control such possible soil erosion are employed, the project should have no significant adverse environmental effects on any Hawaiian plants.

CH. Lamm

TABLE 1. List of plants from Heeia Kea, Oahu.

BOTANICAL NAME	COMMON NAME	STATUS
FERNS		
HEMIONITIDACEAE Pityrogramma calomelanos (L.) Link	gold fern, silver fern	X
NEPHROLEPIDACEAE Nephrolepis multiflora (Roxb.) Jarrett ex Morton	hairy swordfern	X
POLYPODIACEAE Phymatosorus scolopendria (Burm.) Pic.-Ser.	laua'e	X
THELYPTERIDACEAE Christella dentata (Forsk.) Br. & Jer. Christella parasitica (L.) Lévl.	oak fern oak fern	X X
CONIFERS		
ARAUCARIACEAE Araucaria sp.	Norfolk pine	X-C
MONOCOTYLEDONS		
ARACEAE Colocasia esculenta (L.) Schott Scindapsus aureus (Lind. ex André) Engl.	taro, kalo taro vine	X-C X-C
COMMELINACEAE Commelina diffusa Burm. f.	honohono	X
CYPERACEAE Cyperus rotundus L.	nutgrass	X
GRAMINEAE Andropogon virginicus L. Brachiaria mutica (Forsk.) Stapf. Cynodon dactylon (L.) Pers. Digitaria pruriens (Fisch. ex Trin.) Buse Elusine indica (L.) Gaertn. Melinis minutiflora Beauv. Oplismenus hirtellus (L.) Beauv. Panicum maximum Jacq.	broomsedge California grass Bermudagrass kūkaepua'a goosegrass molassesgrass basketgrass guineagrass	X X X X X X X X X

Table 1, p. 2

GRAMINEAE (cont'd)		
Paspalum dilatatum Poir.	dallisgrass	X
Pennisetum purpureum Schumacher.	napierrgrass	X
Setaria geniculata (Poir.) Beauv.	perennial foxtail	X
Setaria palmifolia (Koen.) Stapf	palmgrass	X
LILIACEAE		
Cordyline terminalis (L.) Kunth	ti	X
MUSACEAE		
Heliconia sp.	heliconia	X-C
Musa sp.	banana	X-C
ORCHIDACEAE		
Spathoglottis plicata Bl.	Philippine ground orchid	X
PALMAE		
Cocos nucifera L.	niu, coconut	X-C
PANDANACEAE		
Pandanus odoratissimus L. f.	hala	I
ZINGIBERACEAE		
Hedychium sp.	ginger	X-C
DICOTYLEDONS		
ANACARDIACEAE		
Mangifera indica L.	mango	X-C
Schinus terebinthifolius Raddi	Christmasberry	X
APOCYNACEAE		
Plumeria sp.	plumeria	X-C
BIGNONIACEAE		
Spathodea campanulata Beauv.	African tuliptree	X
CARICACEAE		
Carica papaya L.	papaya	X-C
CASUARINACEAE		
Casuarina equisetifolia Stickm.	ironwood	X
COMBRETACEAE		
Terminalia catappa L.	false kamani	X

Table 1, p. 3

COMPOSITAE			
<i>Ageratum conyzoides</i> L.		ageratum	X
<i>Bidens pilosa</i> L.		Spanish needle	X
<i>Pluchea odorata</i> (L.) Cass.		shrubby fleabane	X
CRASSULACEAE			
<i>Kalanchoe pinnata</i> (Lam.) Pers.		air plant	X
EUPHORBIACEAE			
<i>Aleurites moluccana</i> (L.) Willd.		kukui	X
<i>Codiaeum variegatum</i> (L.) Bl.		croton	X-C
<i>Euphorbia hirta</i> L.		hairy spurge	X
<i>Ricinus communis</i> L.		castorbean	X
GUTTIFERAE			
<i>Calophyllum inophyllum</i> L.		kamani	X
LEGUMINOSAE			
<i>Cassia leschenaultiana</i> DC.		partridge pea	X
<i>Crotalaria incana</i> L.		fuzzy rattlepod	X
<i>Desmodium uncinatum</i> (Jacq.) DC.		Spanish clover	X
<i>Indigofera suffruticosa</i> Mill.		indigo	X
<i>Leucaena leucocephala</i> (Lam.) deWit		koa haole	X
<i>Mimosa pudica</i> L.		sensitive plant	X
<i>Samanea saman</i> (Jacq.) Merr.		monkeypod	X-C
MALVACEAE			
Hibiscus - various hybrids		hibiscus	X-C
<i>Hibiscus tiliaceae</i> L.		hau	I
<i>Thespesia populnea</i> (L.) Soland. ex Correa		milo	X
MORACEAE			
<i>Artocarpus altilis</i> (Parkins. ex Z) Fosb.		breadfruit, 'ulu	X-C
<i>Ficus</i> sp.		banyan	X
MYRSINACEAE			
<i>Ardisia humilis</i> Vahl		shoebutton ardisia	X
MYRTACEAE			
<i>Eugenia cumini</i> (L.) Druce		Java plum	X
<i>Psidium cattleianum</i> Sabine		strawberry guava, waiwi	X
<i>Psidium guajava</i> L.		guava	X

Table 1, p. 4

PASSIFLORACEAE		
Passiflora edulis Sims		X
Passiflora foetida L.		X
RHIZOPHORACEAE		
Rhizophora mangle L.	American mangrove	X
RUBIACEAE		
Paederia foetida L.	maile pilau	X
RUTACEAE		
Citrus sp.	citrus	X-C
VERBENACEAE		
Lantana camara L.	lantana	X
Stachytarpheta jamaicensis (L.) Vahl	Jamaica vervain	X

Names in this list are in accordance with H. St. John's 1973 "List and summary of the flowering plants in the Hawaiian Islands" (for flowering plants only), and with an unpublished checklist of Hawaiian Pteridophytes prepared by C. H. Lamoureux.

The biogeographic status of each species is indicated as follows:

E = endemic = native to the Hawaiian Islands only, not occurring naturally elsewhere.

I = indigenous = native to the Hawaiian Islands and also to one or more other areas.

X = exotic or introduced = not native to the Hawaiian Islands; brought here by man either intentionally or unintentionally.

C = cultivated = plants which grow in Hawaii only in cultivation or which have persisted after cultivation.

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APPENDIX G

FAUNA REPORT

Preliminary Vertebrate Fauna Report for
TMK: 4-6-16: 31 & 32

By Andrew J. Berger

This preliminary report was prepared on instructions received in a letter of February 1, 1982, from Brian L. Gray of Gray, Hong & Associates, Inc. My on-site examination was made on February 2, 1982; the on-site examination was made from the highway, as instructed in Mr. Gray's letter. I assume that an Historical Overview of this area is unnecessary at this time. Mr. Gray's letter asks that I "provide a statement regarding the significance of the existing site with respect to all fauna, and in particular birdlife."

The Existing Site

The site consists of a low lying area near the highway rising to a ridge away from the highway. I doubt very much that there are any endemic plants in this area: it has been disturbed by man for too long a period. All of the plants that I saw were introduced species: grasses, shrubs, and trees. These include pandanus, Norfolk Island pine, banana, coconut, mango, monkeypod, hau, haole koa, African tulip tree, and false kamani. It is, in one sense, a "wasteland." There are no endemic Hawaiian animals on this site; there is no suitable habitat for them.

Fauna

There is no suitable habitat on the proposed construction site for native snails or fishes. The intermittent stream that passes through the area is not suitable for fishes.

A. Amphibians, Reptiles, and Mammals.

There are no endemic amphibians or land reptiles in Hawaii. All in the region, therefore, have been introduced by man.

Amphibians

The giant neotropical toad (Bufo marinus) undoubtedly occurs on the site. It is doubtful that two other amphibians on Oahu are found on this particular site: the gold and black poison frog (Dendrobates adustus) and the American bullfrog (Rana catesbeiana). In any event, their presence would be immaterial to the proposed project.

Reptiles

The presence of the following introduced reptiles, even if present on the site, would be irrelevant to the proposed project: blind snake (Typhlops braminus), mourning gecko (Lepidodactylus lugubris), and fox gecko (Hemidactylus garnoti).

Mammals

The only native land mammal is the Hawaiian bat (Lasiurus cinereus semotus). Kramer (1971) wrote that "to date, it appears that the Hawaiian Bat occurs primarily on the island of Hawaii, and appears only irregularly on the islands of Maui, Oahu, and Kauai." For these islands, "the bats seem to appear only during the months from August to December." It is, therefore, highly unlikely that this bat would be a permanent resident on the site, and, consequently, that the proposed project would have any adverse affect on this mammal.

All of the remaining mammals that probably occur on or near the proposed construction site are serious pests to man and his products: Norway rat (Rattus norvegicus), black rat (Rattus rattus), Polynesian rat (Rattus exulans), house mouse (Mus musculus), and the small Indian mongoose (Herpestes auropunctatus).

B. Birds.

There is no suitable habitat for any endemic bird on the proposed construction site, and this includes the waterbirds (Berger, 1981). I saw only the following introduced species during my field examination of the site: barred dove (Geopelia striata), red-vented bulbul (Pycnonotus cafer), Japanese white-eye (Zosterops japonicus), common Indian myna (Acridotheres tristis), house sparrow (Passer domesticus), ricebird (Lonchura punctulata), cardinal (Cardinalis cardinalis), house finch (Carpodacus mexicanus). Other introduced birds may occur on the slopes of the ridges or may be birds of passage, but the presence of any of these introduced birds should be irrelevant to the proposed construction.

Summary Statement

The existing site is a waste area, choked with introduced plants, many of which are true weed species, and with rubbish of various kinds scattered in the thickets. In my opinion, any change in the site would be an improvement over its present condition. There has not been any native or endemic ecosystem in this area for undoubtedly far more than 200 years. All of the amphibians, reptiles, birds, and mammals on the site have been introduced by man, and many of these introduced animals have proven destructive to man, his products or crops as well as to the endemic flora and fauna. There can be no sound biological reason for opposing construction on the proposed site.

Literature Cited

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Hawaiian Electric Company Land at Heeia Kea
Supplementary Report
September 1982

By Andrew J. Berger

I visited the Heeia Kea project site again on September 11, 1982, in company with David Bills, Charles Lamoureux, Joe Kennedy, and Bill Dornbush. We hiked into the woods at several entrance points, reaching a more or less treeless ridge at one point, at which time we had a rain shower. During this on-site inspection, we deemed it wise to change our course after hearing four shotgun blasts rather near at hand. I visited the area again on September 25, and felt confident that any further trips would not add any important information for the vertebrate fauna report.

Fauna

A. Native Snails and Fishes.

As stated in my February 4, 1982, report, there is no suitable habitat on the proposed construction site for either native snails or fishes.

B. Amphibians, Reptiles, and Mammals.

There is no change from my February 4, 1982 report.

C. Birds.

My additional field work revealed the presence of two additional introduced bird species: Spotted Dove (Streptopelia chinensis) and Melodious Laughing-thrush (Garrulax canorus). Both are common to abundant species on Oahu, as are the other eight species noted in my February report.

The presence of these introduced birds on the project site should be considered irrelevant to the proposed construction for at least two reasons:

1. All of these introduced birds (with the exception of the Laughing-thrush) are now common inhabitants of residential areas on Oahu, and undoubtedly

would continue to inhabit the region after construction was completed.

2. Several of the introduced species already have been shown to be detrimental to man and his crops in Hawaii. For example, the Red-vented Bulbul includes fruits and flower buds in its diet, and the Department of Land and Natural Resources often issues permits to farmers to eliminate the birds that are affecting their crops. Moreover, during March 1977 the U.S. Fish and Wildlife Service proposed that all species of bulbuls be added to the list of "injurious species" that cannot be imported into North America. Other prohibited species already found on Oahu include the Japanese White-eye, the Common Indian Myna, and the Java Sparrow.

The Ricebird and the House Finch have caused major damage to experimental crops in the attempt to increase the diversification of agriculture in Hawaii. The Chairman of the Board of Agriculture reported to the state senate in 1972 that a study of "the bird problem in sorghum fields at Kilauea reveals that Metcalf Farms, Inc., is experiencing 30% to 50% losses due to feeding by large flocks of ricebirds and linnets [i.e., House Finches]. Kohala Corporation similarly reports that, because of bird predation, they were able to harvest only 10 tons of sorghum from a 30-acre planting, which was supposed to produce at least 60 tons of grains."

Summary

After getting into the Heeia Kea forest on September 11, 1982, I see no reason to change any statement made in my February 4, 1982, report. The entire site is, indeed, a "waste area," choked with introduced plants, many of which are weed species, and with all kinds of rubbish (especially old automobile bodies), not only along the highway but also along the dirt trails in the forest. I still feel that any change in the site would be an improvement over its present condition. There is no running water in the forest. [I cannot help but wonder what kind of "agriculture" is being referred to in signs along the highway.]

All of the amphibians, reptiles, birds, and mammals on the proposed site have been introduced by man, and many of these animals are known to be highly destructive to man's products and his crops.

There can be no sound biological reason for opposing construction on the proposed site.