DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
715 SOUTH KING STREET, SUITE 311 ● HONOLULU, HAWAII 96813 ● AREA CODE 808 ● PHONE: 527-5311 ● FAX: 527-5498

JEREMY HARRIS
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DIRECTOR

MANUEL T. VALBUENA
DEPUTY DIRECTOR

July 19, 1999

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 703
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

SUBJECT: Request for Publication
Kahumana Phase II

Transmitted herein please find four copies of the final environmental assessment, an Environmental Notice publication form, and a WordPerfect diskette containing a project summary for the Kahumana Phase II project. We request your assistance in publishing a Finding Of No Significant Impact for the Kahumana Phase II project in the August 8, 1999 issue of the Environmental Notice.

Your attention to our request is greatly appreciated. Please call Keith Ishida at 527-5092 should you have any questions.

Sincerely,

ABELINA MADRID SHAW
Director

AMS:df

Enclosures

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Final Environmental Assessment/Negative Declaration

1999-08-08-OA-FEA-

Kahumana Phase II

Lualualei Valley, Waianae, Hawaii

Prepared By:

Department of Community Services
Community-Based Development Division
City and County of Honolulu
715 South King Street, Suite 311
Honolulu, Hawaii 96813

In Cooperation With:

Alternative Structures International, d.b.a. Kahumana
86-660 Lualualei Homestead Road
Waianae, Hawaii 96792

June 1999

ENVIRONMENTAL ASSESSMENT

Administrative Information

A. Project: Kahumana Phase II

B. Type of Action: ___ Applicant
X Agency

Department of Community Services
City and County of Honolulu
715 South King Street, Room 311
Honolulu, Hawaii 96813
Abelina Madrid Shaw, Director

C. Approving Agencies:

Department of Community Services
City and County of Honolulu
715 South King Street, Room 311
Honolulu, Hawaii 96813

State of Hawaii
Office of Environmental Quality Control (OEQC)
735 South Beretania Street, Room 702
Honolulu, Hawaii 96813

D. Environmental Assessment Prepared by:

Department of Community Services
January 1999

Description of Proposed Actions

A. Proposed Activity

X Single activity;
___ Aggregation of activities;
___ Multi-year activity.

Environmental Assessment Prepared for Compliance with HUD Requirements and Environmental Review Requirements of Other Levels of Government as follows:

A. _X_ State of Hawaii, Supplemental Form EA-S-SOH
B. ___ Guam, Supplemental Form EA-S-GUAM
C. ___ Northern Mariana Islands, Supplemental Form EA-S-NMI
D. ___ Trust Territories of the Pacific Islands, Form EA-S-TTPI
E. ___ American Samoa, Supplemental Form EA-S-ASG

Findings and Conclusions from the Environmental Review

A. Environmental Findings

_X_ Finding of No Significant Impact on the Environment (FONSI)
___ An Environmental Impact Statement is required.

B. Agencies/Interested Parties Consulted

(See Appendix A)

C. Public Notification

1. Finding of No Significant Impact on the Environment and Request for Release of Funds (Combined Notice)

a. Date FONSI/RROF published in local newspaper: _____

b. Last day for recipient to receive comments: _____

c. Last day for HUD to receive comments: _____
d. Date FONSI transmitted to Federal, State or local governmental agencies or interested groups or individuals: _____

e. Date HUD released grant conditions: _____

2. Negative Declaration (Hawaii Only)

a. Date of Draft Environmental Assessment to be published in OEQC Bulletin: April 23, 1996
b. Date on which 30-day comment period expires: May 23, 1996
c. Documentation attached: _X_ Yes ___ No

d. Date of Negative Declaration published in Environmental Notice: _____.

e. Date on which 30-day waiting period expires: _____.

Proposed Project

Alternative Structures International (ASI), a nonprofit corporation, proposes to develop 34 transitional housing units for homeless families on City owned land in Lualualei Valley, Waianae (see Exhibit 1). ASI will be requesting of the City Council various exemptions from land use plans and development requirements pursuant to Chapter 201G, Hawaii Revised Statutes (HRS), to permit multifamily housing development on the project site.

The project is intended to build upon the transitional housing program at Ohana Ola O' Kahumana (Kahumana Phase I) which is located on the eastern edge of the parcel (see Exhibit 2). The Phase II project will be clustered along the western edge of the project site. Kahumana Phase II includes 28 two-bedroom units, 6 three-bedroom units, a multipurpose community center with approximately 4,000 square feet of interior space, approximately 2,000 square feet of storage space, approximately 39 parking stalls, laundry facilities, agricultural areas and open space.

Total project costs are estimated to be approximately $6,500,000. ASI will seek funding through various City, State and federal programs, as well as financial institutions, foundations and other private sources. Pending the receipt of funding and necessary approvals, construction of Kahumana Phase II will begin in the summer of 1999, with a construction period of 12 to 14 months. No additional development of the project site will occur after completion of the Kahumana Phase II project.

Need for Project

Kahumana Phase II was initially proposed as a 34-unit rental housing project for low and moderate income families. During the planning of the project, ASI and the City decided to reorient the project to a transitional housing project for homeless families. The reasons for this decision include (1) The loss of transitional housing resources on the Waianae Coast made the provision of new transitional housing units a high priority; (2) Kahumana Phase II could build upon the success of Ohana Ola O' Kahumana and capitalize on Kahumana's experience in assisting the homeless; and (3) A generally soft rental market in leeward Oahu made the provision of permanent housing at Kahumana Phase II a lower priority.

According to the 1992 study Homelessness and Hunger in Hawaii prepared by SMS Research and Marketing Services. there are an estimated 3.240 homeless persons on Oahu at any one time. Homelessness is dynamic. with families and individuals continuously moving into and out of homelessness. In 1996 a total of 10.845 unduplicated homeless persons received shelter or services within the City and County of Honolulu through contracted service providers of the State Homeless Programs Branch.

On the Waianae Coast. the 14-unit Ohana Ola O' Kahumana and the 45-unit Maililand transitional shelters are the two principal facilities providing shelter and services to homeless families. At present both of these facilities are operating at capacity. The 50-unit Weinberg - Waianae Transitional Housing project was closed in 1997. eliminating a valuable resource for the homeless and reducing the inventory of transitional housing on the Waianae Coast.

Kahumana Phase II will build upon the success of the Ohana Ola O' Kahumana project and permanently add 34 units to the inventory of transitional housing on the Waianae Coast.

Basic Data

Location:	86-433 Kuwale Road. Waianae
Tax Map Key:	8-6-6: 01
Land Area:	12.38 acres
Land Owner/Lessor:	City and County of Honolulu
Lessee:	Alternative Structures International
Description:	Rectangular lot with a dry gulch bisecting the property
State Land Use:	Agriculture District
Development Plan:	Agriculture
Zoning:	AG-1 Restricted Agricultural District
Flood Plain:	Zone D. Area of Unknown Flood Hazard
SMA:	Not in SMA
Existing Land Use:	Transitional housing/open space

Background

The 12.38 acre property was leased to ASI on September 15. 1989 by the City. The project site is presently improved with the 14-unit Kahumana Phase I. a transitional housing project for homeless families which occupies approximately 1.5 acres on the eastern edge of the property. The remainder of the site is vacant. Construction of Kahumana Phase I was completed in August of 1991 and was developed after exemptions from planning. zoning and land development standards were granted by the City Council

pursuant to Chapter 201E. HRS. Prior to the development of Kahumana Phase I. the project site was used for the cultivation of various truck crops.

Alternatives Considered

A. Alternative Sites

The need for transitional housing for homeless families which provides shelter as well as supportive social services remains high and other suitable ASI or City owned parcels to build such a facility are non-existent. By developing on the Lualualei parcel. funds that would have been used to lease or purchase property may be used to increase the number of units and services provided by ASI.

ASI also operates the Kahumana Community Center which is adjacent to the project site and which provides housing and supportive services to the chronically mentally ill. Many of the ASI staff reside on this parcel and the programs used by the residents of Kahumana Phase I are provided there. The programs will also be made available to the residents of Kahumana Phase II and are located within walking distance to the project site.

B. No Project

By not implementing the project. none of the adverse environmental impacts would occur. however; none of the positive social benefits would be realized. The anticipated social benefits of this project far outweigh the potential environmental impacts which can easily be mitigated.

IMPACT CATEGORIES

* Note: Rating of environmental factors are as follows:
1. Potentially beneficial impact.
2. No impact anticipated.
3. Minor adverse impacts anticipated.
4. Adverse impact requires mitigation.
5. Adverse impact requires modification to project/activity.

I. Land Development

A. Conformance with Comprehensive Plans and Zoning

Rating: 3 - Minor Adverse Impacts Anticipated

Sources: Planning Department letter dated January 16, 1996
State Land Use Commission Letter dated December 29, 1995
Department of Land Utilization did not have any comments

The parcel is within the State Agriculture District, is designated for Agricultural use on the City's Waianae Development Plan Land Use Map, and is zoned AG-1 Restricted Agriculture. The City Council by adoption of Resolution 89-351 provided exemptions from planning, zoning and land development for Kahumana Phase I pursuant to Section 201E-210, HRS. The proposed project is not a permitted use under these land use designations. Additional exemptions from the City's Waianae Development Plan and Land Use Ordinance (LUO) and the State Land Use District will be requested pursuant to Chapter 201G, Hawaii Revised Statutes. Other exemptions from LUO development standards will be requested as necessary. Potential exemptions include, but are not limited to, the following:

1. Exemption from the State Land Use Agricultural District Boundary to allow multifamily residential development in the agricultural district. The project site is less than 15 acres and pursuant to Section 205-3.1, HRS, falls under the jurisdiction of the Planning Department.

2. Exemption from the Planning Department's "Procedures for the Amendment of State Land Use District Boundaries for Parcels of Fifteen Acres or Less" (in agricultural districts).

3. Exemption from Ordinance 83-11, as amended, the Waianae Development Plan Land Use Map to permit low density apartment use on a parcel designated for agricultural use.

4. Exemption from the LUO to permit A-1 low density apartment development on a parcel zoned AG-1, Restricted Agriculture.

5. Exemption from 3.70-1(Table 3.1) of the LUO to provide a total of 39 parking stalls versus the 73 parking stalls required.

6. Exemption from Ordinance 2412 relating to the construction of required street improvements (curbs, gutters, etc.) as this is a rural district which lacks such improvements on Lualualei Homestead Road and Kuwale Road.

7. Exemption from Chapter 7, Article 7, Revised Ordinances of Honolulu (ROH), relating to park dedication requirements.

8. Exemption from Chapter 22, Article 5, ROH, to permit the use of overhead utility lines.

The final list of exemptions will be determined when preliminary plans and specifications are completed. The Planning Department has no objections to the project and proposed exemptions provided that facilities and utilities are adequate for the project.

B. Compatibility and Urban Impact

Rating: 3 - Minor Adverse Impacts Anticipated

Sources: Existing Land Use Map
Kahumana Phase II Site Plan (Exhibit 2)
Department of Agriculture letter dated February 2, 1996

The proposed project is located in a predominately agricultural district. The majority of dwellings and structures in the area are either directly or indirectly related to agricultural production. The Kahumana proposed project will extend the existing "spot" of non-agricultural use by the Kahumana Community Center and Ohana Ola O' Kahumana.

The Department of Agriculture requested that the project be located in or adjacent to an Urban District/residential area but would be more receptive to a project with a substantial agricultural component as an integral part of its program.

Although the predominant use of the parcel will be to provide transitional housing, the parcel will also incorporate open space and agricultural use. Project plans include a Hawaiian garden and community gardens. The Hawaiian garden will be used to teach farming skills and used also as an education/resource center to residents, clients and the community.

The design is sensitive to the surrounding neighborhood. The proposed single-story wood structures (17 duplexes) will have a residential appearance with architectural characteristics that are vernacular to

the area. The parking area will be landscaped to minimize the visual impact of the project on the surrounding community.

C. Slope, Erosion and Soil Suitability

Rating: 2 - No impact anticipated

Source: United States Soil Conservation Service, "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii." (August 1972)

Department of Agriculture letter dated November 25, 1995

Dames and Moore's Report, "Geotechnical Investigation, Kahumana Rental Housing Project, TMK: 8-6-6:01 (Lot 146-A), Lualualei Homestead Road, Waianae, Oahu, Hawaii"

The United States Soil Conservation Service classifies the soil at the project site as Lualualei clay (LuA), 0 to 2 percent slopes; Lualualei clay (LuB), 2 to 6 percent slopes; and Lualualei stony clay (LvA), 0 to 2 percent slopes.

This soil is used for sugarcane, truck crops, pasture, wildlife habitat, urban development and military installations. The very sticky and very plastic nature of the clay makes cultivation difficult and practical only within a narrow range of moisture content. Because of the high shrink-swell potential, considerable care is necessary when using this soil as a site for buildings or highways.

A geotechnical investigation (Appendix B) was completed by Dames and Moore on October 23, 1995, which found that the project is feasible from a geotechnical standpoint. A large portion of the onsite soils appear dense and stiff from a depth of one foot below the existing ground surface and the proposed buildings may be supported on shallow footings. There are certain areas of the site with highly expansive clays which are not suitable to support building footings or construction of absorption fields. Dames and Moore's recommendation is the removal of these clays and replacement with non-expansive, granular soils that are necessary for the building footing or absorption field areas. Proper excavation and fill techniques will be employed to prevent settlement and shifting of building foundations as described by the Dames and Moore geotechnical investigation report.

D. Hazards, Nuisance and Site Safety

Rating: 2 - No impact anticipated

Source: Department of Agriculture letter dated February 2, 1996
Dames and Moore letter dated October 25, 1995
Kahumana Phase II Site plan (Exhibit 2)
Site inspection by Lorna Uesato, April 3, 1996

There is no evidence of existing mills, or industrial plants, electric and gas manufacturing plants and oil storage areas in the vicinity of the project area. The site inspection also revealed no indication of natural hazards such as geologic faults, flooding, volcanic activity or landslide. There is no evidence of hazards imposed by inadequate traffic control, visual obstructions to traffic, or inadequate separation of traffic. There is no evidence of thermal-explosive or radioactive hazards near the project site.

There is evidence of a number of other potentially hazardous materials observed on the site during a field exploration by Dames and Moore. Materials found include possible asbestos roofing materials, abandoned car batteries, a number of drums containing unknown materials and other unidentified materials. A hazardous waste investigation will be conducted and a mitigation plan prepared prior to any grubbing or grading of the site.

Though the presence of agricultural uses in the area suggest that hazards and nuisances associated with agricultural production such as noise, odors and pesticide over-spray may be present, none were detected during a site visit and no complaints from the residents/clients of the two existing ASI projects at the site have been brought to the City's attention. As an extra precaution, landscaping such as a berm and trees will be placed along the southern edge of the property to help minimize any over-spray or fugitive dust from the adjoining property along the southern border. Landscaping will also act as a buffer to separate the property from surrounding uses.

DHCD will notify ASI of the Hawaii Right to Farm Act and require them to inform residents of the project of the existing agricultural use in the surrounding areas, related nuisances and the Hawaii Right to Farm Act.

E. Energy Consumption

Rating: 2 - No impact anticipated

The project will receive electric, gas and telephone service from the respective utility companies.

II. Noise

Ratings: 3 - Minor adverse impact anticipated (Short Term)
2 - No Impact Anticipated (Long Term)

Source: Site Inspection by Lorna Uesato, April 3, 1996
Department of Health letter dated February 7, 1996

Short term increases in ambient noise levels resulting from construction related activities are anticipated. The building contractor will be required to comply with Title 11, Department of Health Administrative Rules, Chapter 43, "Community Noise Controls for Oahu."

The proposed project does not include activities or uses which will significantly affect noise levels in the project area. There are no high speed or highly utilized roadways near the project site which would indicate the presence of high levels of vehicular noise. A site inspection revealed no evidence of stationary noise sources such as air conditioning units, compressors, industrial machinery or power generating stations.

Due to the agricultural nature of the adjoining property south of the project site, occasional tractor noises shall occur. Landscaping such as trees and berms along the property should help to absorb and minimize noise disturbances.

III. Air Quality

Rating: 3 - Minor adverse impacts anticipated (Short Term)
2 - No Impact Anticipated (Long Term)

Source: Site Inspection by Lorna Uesato, April 3, 1996

Temporary adverse conditions may occur during construction activities due to dust and heavy equipment. Frequent watering of the site during any grading or excavation work in accordance with Title 11, Department of Health

Administrative Rules. Chapter 60. "Air Pollution Controls." Section 5. "Fugitive Dust." will minimize the release of fugitive dust into the immediate environment.

The proposed project does not include activities or uses which will significantly degrade ambient air quality in the project area. There are no heavily utilized roadways in the vicinity of the project site which would indicate the presence of high levels of vehicle-generated airborne pollutants. A site visit revealed no evidence of stationary sources of air pollutants such as power plants. sugar mills and industrial manufacturing.

IV. Environmental Design and Historic Values

A. Visual Quality - Coherence. Diversity. Compatible Use and Scale

Rating: 3 - Minor Adverse Impacts Anticipated

Source: Site Inspection by Lorna Uesato. April 3. 1996

The proposed project will be a departure from the existing rural development pattern of the surrounding area. Attention will be given to site planning. landscaping and architecture that is vernacular to region to reduce the visual impact of the project on the surrounding area.

See Section I.B Compatibility and Urban Impact

B. Historic. Cultural and Archeological Resource

Rating: 2 - No impact anticipated

Sources: Department of Land and Natural Resources letter dated January 12. 1996

Site Inspection by Lorna Uesato. April 3. 1996

The Department of Land and Natural Resources states that there are no known site or sites listed on or eligible for the Hawaii or National Registers of Historic Places at the project site. DLNR further states that it is unlikely that ground surface archaeological sites will be present at the project site because the parcel has been in agricultural use for an extended period of time. Should subsurface artifacts be

uncovered during excavation or trenching, all work will be immediately stopped and the State Historic Preservation Office will be notified.

V. Socio-Economic

A. Demographic/Community Character Changes

Rating: 3 - Minor Adverse Impact Anticipated

The proposed 34 unit project is not expected to significantly change the demographic characteristics of the Waianae Coast. The proposed project will not require or result in the displacement of any community facilities or services. The total population to be generated by the project is estimated to be 110 persons.

B. Displacement

Rating: 2 - No Impact Anticipated

The proposed project will not require or result in the displacement of any residences or businesses. The proposed site is currently vacant.

C. Employment and Income Patterns

Ratings: 1 - Potential Beneficial Impact

The project will result in the creation of temporary employment in construction related trades during the construction of the project. In addition, long term employment will be generated through the operation and maintenance of the project. The proposed project will not significantly alter the community's employment and income patterns. The residents of the project are expected to be of low income.

VI. Community Facilities and Services

A. Educational Facilities

Rating: 3 - Minor Adverse Impact Anticipated

Source: Department of Education letter dated January 10, 1996

The Department of Education (DOE) states that the proposed project will have an impact on the schools in the Waianae Complex. They have determined that the residential units will generate 9 students in grades kindergarten to 6, 2 students in grades 7 to 8, and 3 students in grades 9 to 12.

The three schools in the area, Leihoku Elementary, Waianae Intermediate and Waianae High are currently operating at capacity. DOE cannot guarantee availability of classrooms to accommodate students from this development. The schools have been absorbing the additional students into their program and are using portable classrooms. Due to severe budget cuts, construction of additional classrooms is not being planned. The Department of Education is looking at the possibility of changing to a multi-track system once enrollment is increased significantly making it financially feasible to operate.

B. Commercial Facilities

Rating: 2 - No impact anticipated

Source: Site inspection by Lorna Uesato, April 3, 1996

The Waianae Mall and Waianae Commercial Center are located approximately three miles from the project site and provide a wide range of shopping opportunities for residents of the Waianae Coast. There are also many small shops and convenience stores along Farrington Highway. The project does not involve the displacement of any commercial establishments.

C. Health Care

Rating: 2 - No Impact Anticipated

Source: Existing Land Use Map.

Emergency medical services are available at the Waianae Coast Comprehensive Health Center within 3 miles from the project site. Critical emergencies are air lifted to one of the major hospitals in urban Honolulu. Patients requiring routine care may be treated at the Waianae Coast Comprehensive Health Center or at Kaiser's Maili clinic on Saint John's Road. Specialized medical care is provided at Saint Francis-West Hospital, Pali Momi Hospital at Pearlridge, Kaiser

Moanalua Hospital or one of the many hospitals in Honolulu. The City provides 24-hour emergency ambulance and first aid coverage island wide.

D. Social Services

Rating: 2 - No impact anticipated

The project will have the beneficial impact of available supportive services from the adjoining Kahumana Community Center and Kahumana Phase I. A community center for the residents of the proposed Kahumana Phase II has been incorporated into the project design. A Post Office, Library and Satellite City Hall are located along Farrington Highway and are approximately 3 miles from the project site. By providing permanent affordable rental housing, the project will enable 34 households to escape homelessness and reduce their reliance on public assistance.

E. Solid Waste

Rating: 2 - No impact anticipated

The project qualifies for City front-end loader rubbish collection service provided that City requirements regarding the size of the trash bins and access to the trash bins by City trucks are fulfilled.

F. Wastewater

Rating: 2 - No impact anticipated

Source: Department of Public Works letter dated December 29, 1995
Department of Health letter dated February 7, 1996

There are no City sewers servicing the project area. A private system utilizing septic tanks and absorption fields will be used to satisfy the project's wastewater disposal requirements in accordance with Title 11, Department of Health Administrative Rules, Chapter 62, "Wastewater Systems," Subchapter 2. The civil engineer, Sam O. Hirota, Inc. has been in contact with the Department of Health to discuss safety and health concerns and was instructed to set back the absorption fields a minimum of 4 feet from the dry gulch. A wastewater plan will be

submitted to the Department of Health and the Department of Environmental Services for review and approval prior to implementation.

G. Storm Water

Rating: 2 - No impact anticipated

Source: The Department of Public Works letter dated January 8, 1996
Planning Department letter dated January 16, 1996

The Waianae Development Plan Public Facilities map shows a symbol for publicly funded drainage improvements (Mailiili Drainage Canal) in the general vicinity of the subject area.

There are no curbs or catch basins along Kuwale Road or Lualualei Homestead Road to direct and capture storm water runoff. Storm water is collected by swales along Lualualei Homestead Road and Kuwale Road and directed toward Mailiili Stream. Onsite drainage consists of an earthen ditch (dry gulch) which approximately bisects the parcel in a mauka to makai direction. The dry gulch is owned by the City and leased along with the entire property to ASI. The existing grade of the parcel directs storm water runoff into the drainage ditch which eventually discharges into the Mailiili Stream.

The project has been designed to work with the existing contours and existing dry gulch alignment. The proposed project will marginally reduce the available percolation area of the parcel. Landscaping and grassing will be installed to prevent the erosion of topsoil by storm water runoff. A drainage plan will be prepared and submitted to the Department of Planning and Permitting for review and approval to ensure proper site drainage.

H. Water Supply

Rating: 2 - No impact anticipated

Source: Board of Water Supply (BWS) letter dated January 16, 1996

The BWS states that the existing 1-1/2 inch water meter serving the parcel is adequate to accommodate the proposed development. Availability of water will be confirmed when the building permit is submitted for review and approval. When additional water is made

available, the applicant will be required to pay BWS's Water System Facilities Charges. If a three-inch or larger meter is required, construction drawings showing the installation of the meter will be submitted to BWS for review and approval. Prior to the issuance of the building permit application, the proposed project will be subject to BWS cross connectional control requirements.

I. Public Safety

1. Police

Rating: 3 - Minor adverse impacts anticipated (long term)

Source: Police Department letter dated January 3, 1996

The Honolulu Police Department States that the proposed project will not significantly impact any police facilities or services.

2. Fire Protection

Rating: 2 - No impact anticipated

Source: Honolulu Fire Department letter dated January 5, 1996

Primary fire protection for the proposed project will be provided by the engine company located at the Waianae Fire Station located approximately three miles from the project site. Additional fire services are available from engine companies located at the Nanakuli, Makakilo and Kapolei Fire Stations. The Honolulu Fire Department has no objections to the project provided that the project is in compliance with existing codes and standards.

3. Emergency Medical

Rating: 2 - No impact anticipated

See Section VI.C Health Care.

J. Open Space, Recreation and Cultural Facilities

Rating: 1 - Potentially beneficial impact

Source: Department of Parks and Recreation letter dated January 8, 1996

The Department of Parks and Recreation states that the nearest public park, Maili Playground, is over two and one-half miles away from the project site. The 22.920 acre Waianae District and the 19.5 acre Waianae Regional Park are located along Farrington Highway approximately 4 miles from the project site. Onsite recreation space, community gardens and a multipurpose community center with approximately 4.00 square feet of interior space.

Same comment Incomplete sentence Available at Kalaeloa or Ewa Plc

K. Transportation

Rating: 3 - *Minor adverse impacts anticipated (short term and long term)*

Sources: Department of Transportation letter dated January 4, 1996
Institute of Transportation Engineers, 5th edition

The Department of Transportation states that the proposed project will have no impact on the State highway system. Any temporary road closures or work within the City's right-of-way necessary to undertake construction of the project will be coordinated with the Department of Transportation Services.

The proposed project will marginally increase vehicular traffic on Lualualei Homestead Road, which at present is subject to very low levels of vehicular traffic. All roadways serving the project will allow two way traffic with adequate sight distance at the entrance of the site from Lualualei Homestead Road. Adequate off-street parking for residents and guests will be provided. A City shuttle bus stop is located on Lualualei Homestead Road approximately 1/3 mile from the project site. The shuttle bus transports passengers from Lualualei Valley to the main Honolulu-Makaha bus route on Farrington Highway with service every 50 minutes.

The proposed plan will provide 39 parking stalls on-site at one stall per unit with the remaining 5 stalls for staff and guests. As originally planned with 32 permanent rental units, the project was projected to generate an estimated 22 vehicle trips for the morning peak hours (18-out & 4-in), 26 vehicle trips (9-out & 17-in) in afternoon peak hours and 328 vehicle trips (164-in & 164-out) over a

24-hour period. The revised plan with 34 transitional units is not anticipated to significantly change vehicular trips. Typically a change in a project's units mix from studios, one bedroom and two bedroom units to only two- and three-bedroom units, and the addition of two additional residential units would suggest that vehicular trips would increase. However, the project as presently proposed will serving homeless families who typically have a lower rate of automobile ownership than sheltered families. This factor should offset the potential increase in peak hour vehicular due to the changes in the project's unit mix.

VII. Natural Features

A. Water Resources

Rating: 2 - No anticipated impact

Source: Board of Water Supply. "Oahu Water Plan. 1982"
Board of Water Supply letter dated January 16. 1996

The project site is located in the Board of Water Supply's Honolulu water use district. The project site is not located near any intermittent or perennial stream, lake, or reservoir. The project will not affect water quality or yields.

B. Floodplain Management

Rating: 2 - No impact anticipated

Sources: Department of the Army letter dated January 10. 1996

Federal Emergency Management Agency. "Flood Insurance Rate Map. City and County of Honolulu." Panel No. 150001-0100C and Panel No. 150001-0070A

The parcel is located in Flood Zone D. which are areas of undetermined flood hazard.

C. Wetlands Protection

Rating: 2 - No impact anticipated

Source: Department of the Army letter dated January 10, 1996

Department of Land and Natural Resources letter dated March 28, 1995.

The project is not located in an area which is in or near a wetland area. In a letter dated March 28, 1995 to the project architect, Urban Works, Inc., the Department of Land and Natural Resources' Commission on Water Resource Management (CWRM) has verified that the dry gulch running through the property is not a "stream" as defined in Section 13-169-2, Hawaii Administrative Rules (HAR), and is not subject to any stream channel alteration permit pursuant to Section 13-169-50, HAR. The proposed plan will not disturb the existing alignment of the dry gulch and therefore, a Department of the Army permit is not required. The CWRM's letter is attached as Appendix C.

D. Coastal Zones

Rating: 2 - No impact anticipated

Source: Coastal Zone Management (CZM) Program Assessment Form
Office of State Planning letter dated March 7, 1996
Site Inspection by Lorna Uesato, April 3, 1996

The Department of Housing and Community Development has completed the Hawaii CZM Program Assessment Form and has determined that the proposed project is consistent with the Hawaii CZM program. The Office of State Planning has concurred with this determination.

E. Vegetation and Animal Life

Rating: 2 - No anticipated impact

Source: United States Department of Interior letter dated February 1, 1996

Site Inspection by Lorna Uesato, April 3, 1996

The project is located in an area that has been in agricultural use for an extended period of time. Sensitive species do occur in certain

areas of Lualualei Valley but the project site is devoid of any rare or endangered species and wetlands.

F. Agricultural Lands

Rating: 3 - Minor Adverse Impacts Anticipated

Sources: Existing Land Use Map
Department of Agriculture letter dated February 2, 1996
Site Inspection by Lorna Uesato, April 3, 1996

The project site is located in the State Agriculture District. The Department of Agriculture states that it is the County's most restrictive agriculture zone (AG-1) and that the project should be located in an Urban District or residential area.

The proposed project will emplace 34 transitional housing units on what is currently vacant land. The preliminary plan provides areas to be used as open space or for agricultural cultivation by the residents of Phase II as well as those of ASI's other programs and the community. The project is not expected to impact existing agricultural activities in the area.

A Farmland Conversion Impact Rating form was submitted during Kahumana Phase I to the Soil Conservation Service field office, for the conversion of 6.191 acres of the 12.38 acre parcel. Of that 6.191 acres, approximately 1.5 acres was actually developed for Kahumana Phase I, with the remaining acres left as open space with future plans for community gardens. Another Farmland Conversion Impact Rating form (Appendix D) has been submitted for the Kahumana Phase II development requesting conversion of an additional 4.1 acres, which includes the existing entrance driveway to the site. Approximately 50 percent of the converted 4.1 acres will be used for community gardens and landscape/open space. The remaining 2.089 acres north of the dry gulch will remain in agricultural use (see Exhibit 2).

See Section I.B Compatibility and Urban Impact

Determination

It is determined that the proposed action will have no significant impact on the quality of the human environment and an Environmental Impact Statement is not required. The bases for this determination are as follows:

A. The number of units emplaced by the project is far below the threshold (2,500 units) which would require the preparation and dissemination of an Environmental Impact Statement under the provisions of Section 58.37 Federal Register, Volume 47, No. 70 dated April 12, 1982.

B. The potential environmental impacts of this project are easily mitigated or are evaluated as not significantly affecting the quality of the human environment:

1. Short term increases in noise levels attributable to construction related activities will be mitigated through compliance with Title 11, Administrative Rules, Department of Health, Chapter 43, "Community Noise Controls for Oahu."

2. Escape of fugitive dust into the environment will be minimized by frequent watering of the project site during clearance and excavation.

3. The impacts of the project on public services and facilities, and the visual impacts of the project on the neighborhood are evaluated as minimal and not significantly affecting the quality of the human environment.

4. The removal of hazardous substances and materials found on the site will be done in accordance with all federal and state statutes and will benefit the environment of the area.

C. The impact of converting agricultural land (currently vacant) to be used for multifamily housing will be minimized by keeping approximately 50% of the undeveloped land for agricultural use, community gardens and open space. ASI integrates agricultural farming skills as part of its vocational training for its clients, residents and the community. An example is ASI's Kahumana Community Center project which incorporates 5 acres of citrus orchards, 2 acres of vegetable produce and 2 acres of pasture land which is used for commercial use as well as to provide meals to ASI staff, clients and homeless persons. The land is farmed by ASI members and clients as part of ASI's program.

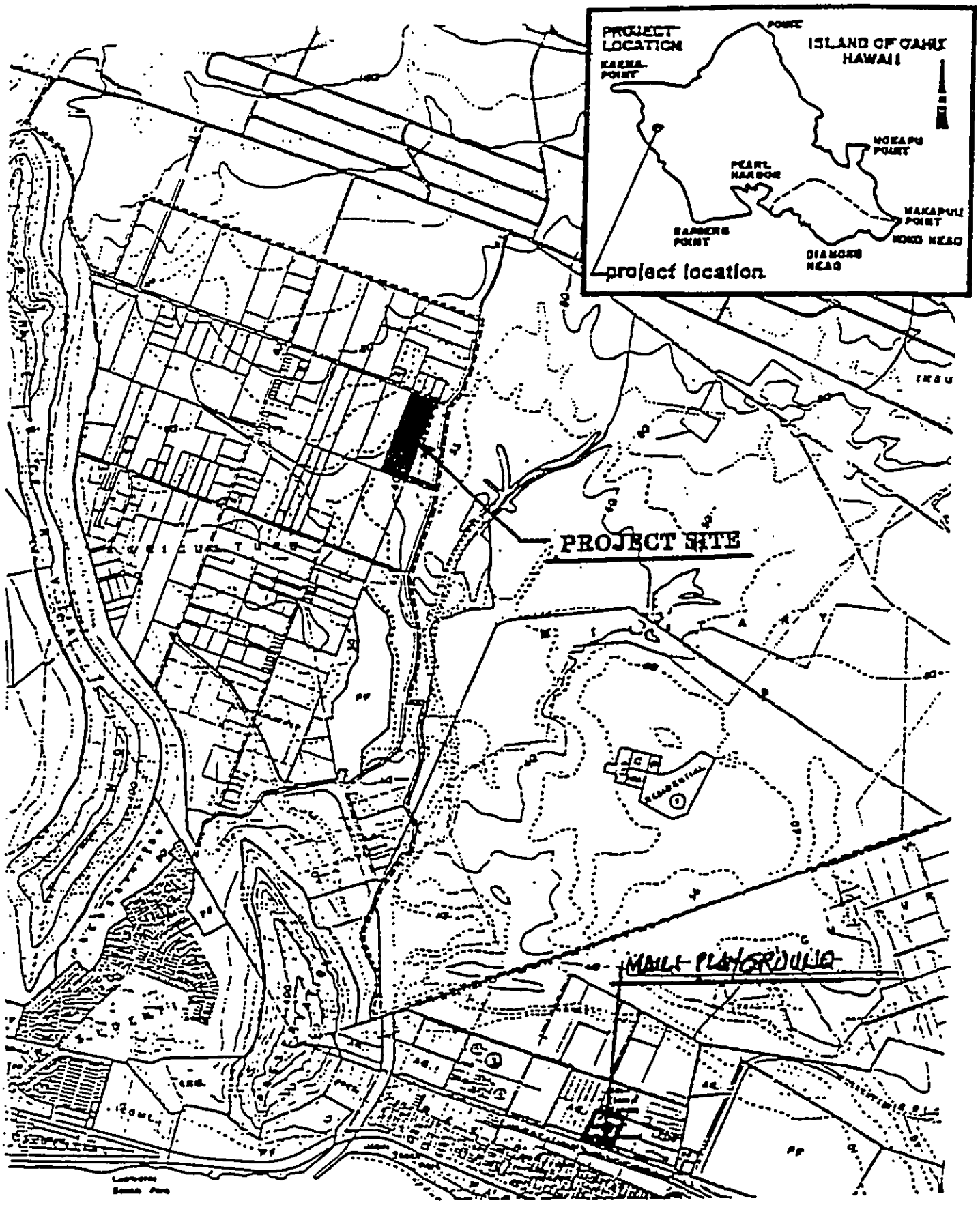
ASI's Kahumana Community Center has been serving the Waianae community since 1974 and Kahumana Phase I has been serving the community since 1991. The two projects have been able to coexist with its integral agricultural program and with the agricultural uses in the surrounding area. Since its opening, there have been no complaints to the Department of Housing and Community Development by residents of Kahumana Phase I due to the adjacent agricultural activities. Information on the existing agricultural use in the surrounding area will be disclosed to future residents of Kahumana Phase II.

D. The project will have the positive social benefit of providing transitional housing and supportive services to homeless families.

A Final Environmental Assessment will be filed with the State Office of Environmental Quality Control and a negative declaration is anticipated. A Finding of No Significant Impact on the Environment will also be published in a newspaper of general circulation.

Location Map

Exhibit 1

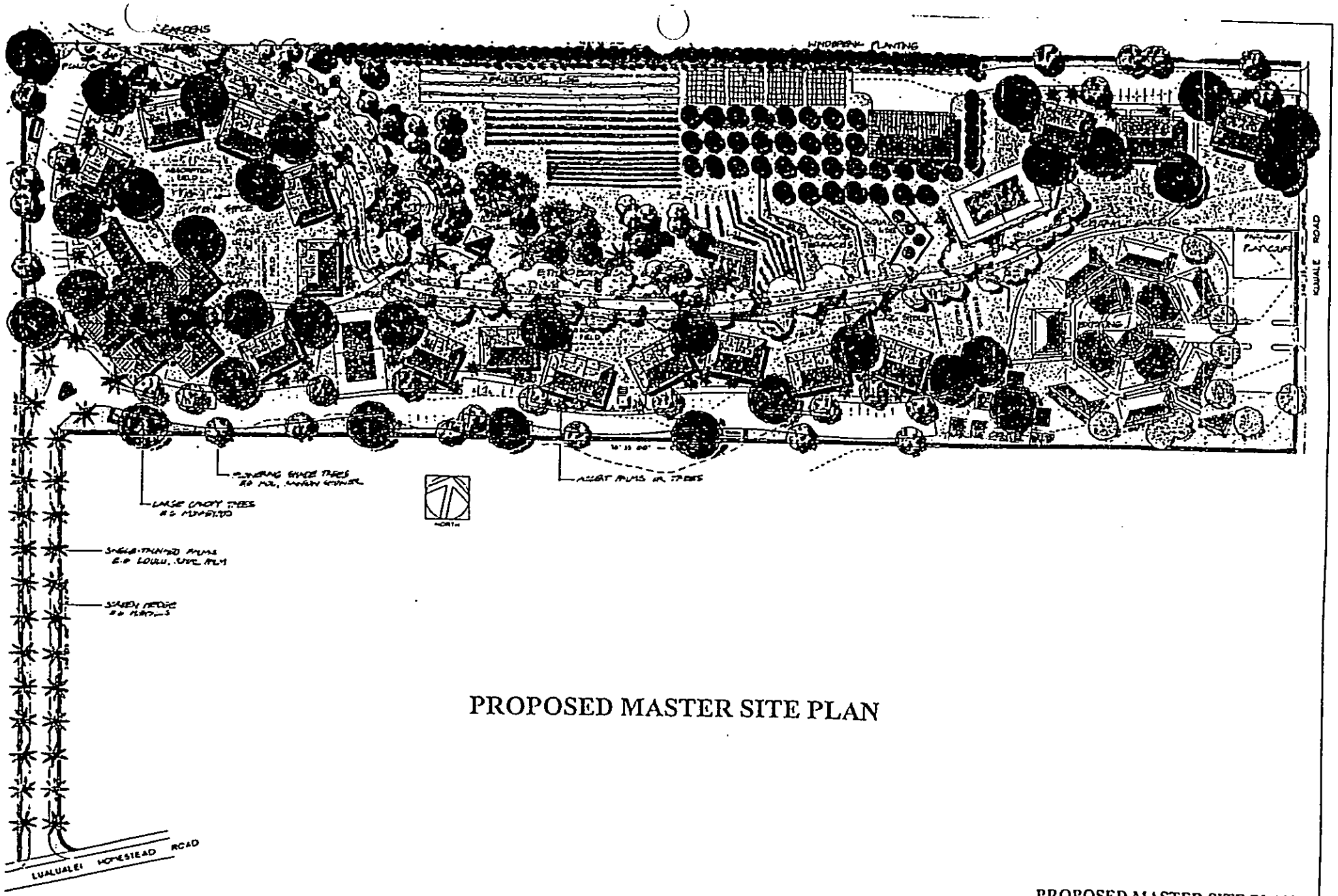


KAHUMANA HOUSING PROJECT PHASE II
TMK: 8-6-6:1

Department of Housing and Community Development
650 South King Street, Hon. HI 96813

Site Plan

Exhibit 2

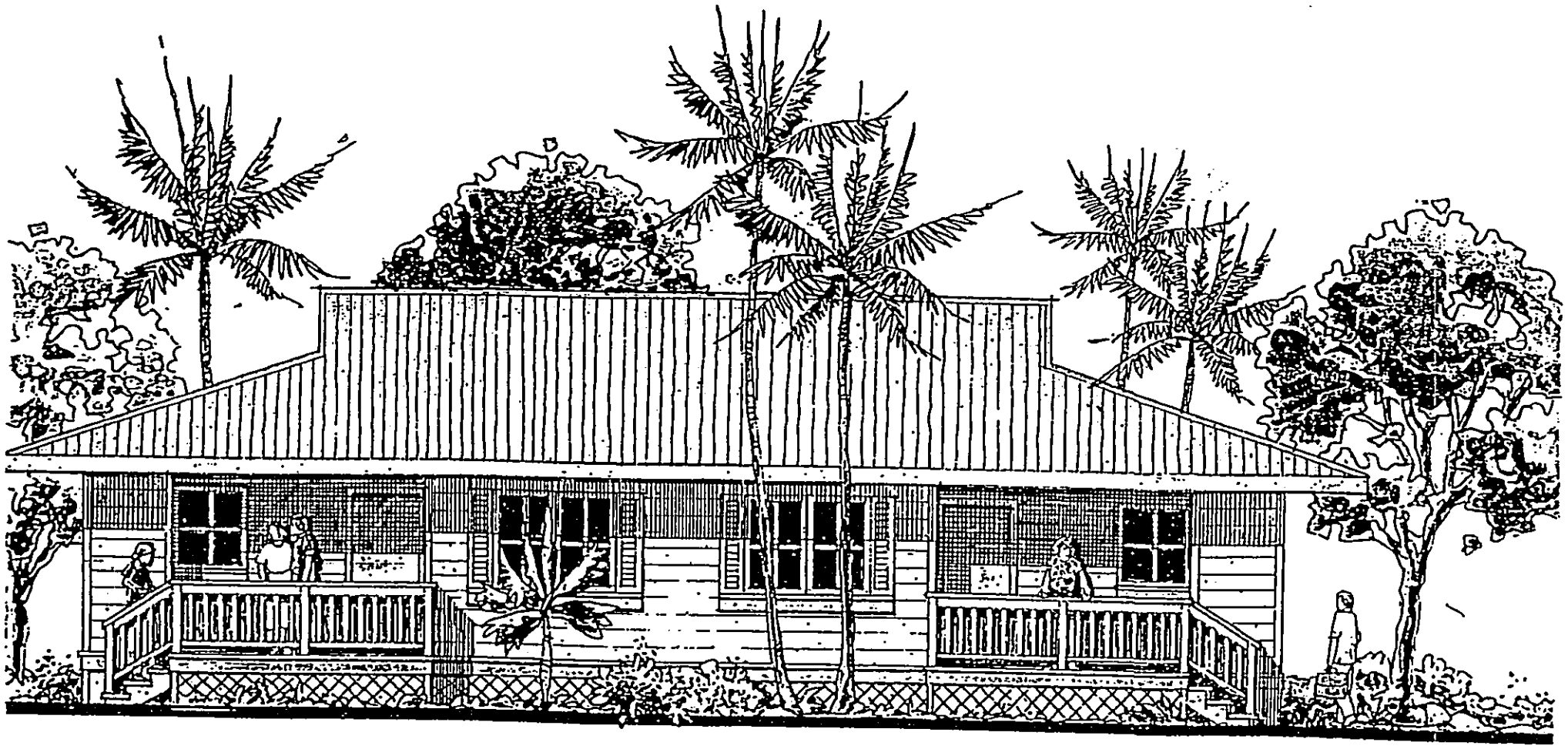


PROPOSED MASTER SITE PLAN

PROPOSED MASTER SITE PLAN

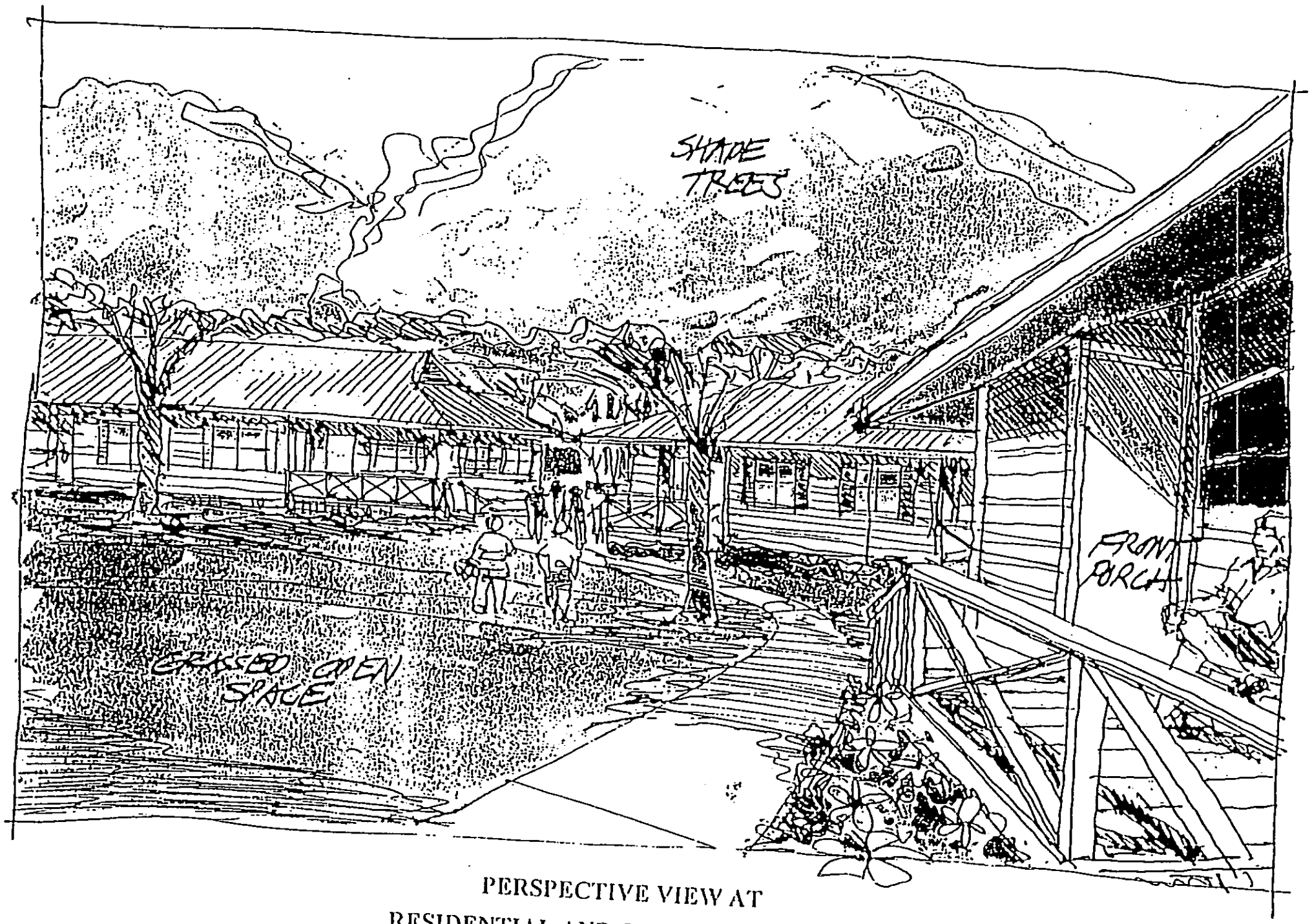
EXTERIOR ELEVATION "C" (LANAI-SIDE)

EXTERIOR ELEVATION "C"
(LANAI SIDE)

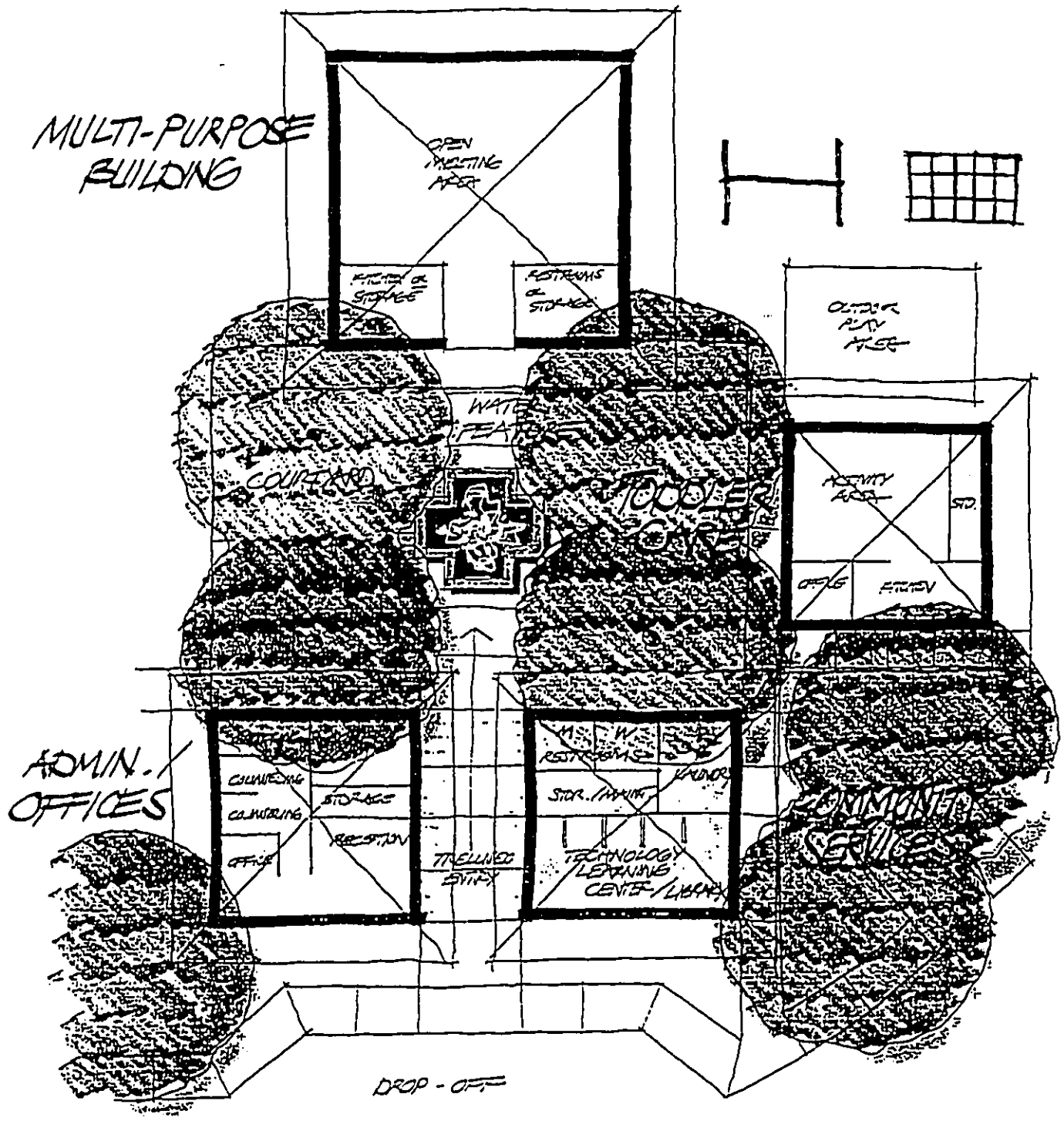


EXTERIOR ELEVATION "A" (PORCH-SIDE)

EXTERIOR ELEVATION "A"
(PORCH SIDE)



PERSPECTIVE VIEW AT
RESIDENTIAL AND COMMUNITY AREA



COMMUNITY CENTER

OHANA OLA - INCREMENT 2

MARCH 15, 1993

1/8" = 1'-0"

MIYAMOTO ASSOCIATES

Agency Responses

Appendix A

DISTRIBUTION LIST

	Comment Received
Federal	
U.S. Department of Housing and Urban Development	*
U.S. Army Corps of Engineers	1/10/96
U.S. Department of the Interior, Fish and Wildlife Service	2/ 1/96
State	
Department of Education	1/10/96
Department of Business, Economic Development and Tourism	---
Office of State Planning, Governor's Office	*
Department of Health	2/ 7/96
Department of Land and Natural Resources	---
Department of Land and Natural Resources, Historic Preservation Division	1/12/96
Department of Transportation	1/ 4/96
Department of Agriculture	2/ 2/96
Housing Finance and Development Corporation	1/16/96
Hawaii Housing Authority	---
University of Hawaii Environmental Center	---
Office of Environmental Quality Control	---
Land Use Commission	12/29/95
City	
Planning Department	1/16/96
Department of Land Utilization	*
Department of Transportation Services (Letter misdated as 1/19/95)	1/19/96
Building Department	1/17/96
Department of Public Works	1/ 3/96
Department of Parks and Recreation	1/ 8/96
Board of Water Supply	1/16/96
Honolulu Fire Department	1/ 5/96
Honolulu Police Department	1/ 3/96
Department of Human Resources	1/ 9/96
Department of Wastewater Management	12/29/95
Others	
Honorable John DeSoto	---
Mr. Samuel Kahele, Jr., Chair Waianae Coast Neighborhood Board No. 24 c/o Neighborhood Commission City Hall, Room 400 Honolulu, Hawaii 96813	---

* Will not respond -- no comment.

DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

January 10, 1996

Planning and Operations Division

'96 JAN 11 A9:33

Mr. Roland D. Libby, Director
City and County of Honolulu
Department of Housing and Community Development
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

DEPT. OF ... & COMM. DEVELOPMENT

Dear Mr. Libby:

Thank you for the opportunity to review and comment on the Environmental Assessment for the Kahumana Phase II Project, Waianae, Oahu. The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. Based on the information provided, a DA permit will not be required for the project. However, a DA permit may be required if any activities are conducted in the gulch adjacent to the proposed development. Please contact our Regulatory Section at 438-9258 for further information and refer to file number 960000028.

b. The flood hazard information provided on page 1 of the environmental assessment is correct.

Sincerely,

Paul Mizue, P.E.
Acting Chief, Planning
and Operations Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOREGION
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

In Reply Refer To: AAP

FEB 01 1996

96 FEB -6 P2:30

Mr. Roland D. Libby, Jr.
Department of Housing and Community Development
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

DEPT. OF HOUSING & COMM DEVELOPMENT

Re: Notice of Intent (NOI) to Prepare an Environmental Assessment (EA) for the Kahumana Phase II Development in Lualualei Valley, Waianae, Hawaii.

Dear Mr. Libby:

The U.S. Fish and Wildlife Service (Service) has reviewed the Notice of Intent (NOI) to prepare an Environmental Assessment (EA) for the Kahumana Phase II development in Lualualei Valley, Waianae, Hawaii. The project sponsors are the Department of Housing and Community Development and Alternative Structures International. Federal HOME funds will pay for project planning and design. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended, and other authorities mandating Service concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

Based on the NOI, the purpose of the proposed development is to provide permanent rental housing for lower income families and the elderly upon a 5-hectare (ha) [12- acre (ac)] parcel of land. Project features include 34 residential units, a multi-purpose community center, parking space, laundry facilities, and open space. Fourteen transitional housing units for homeless families currently exist along the eastern edge of the property and occupy 0.6 ha (1.5 ac) of the affected site. Otherwise, limited information on the affected site was provided.

The Service does not anticipate significant adverse impacts to fish and wildlife resources to result from implementation of the proposed development. Although sensitive species do occur in certain areas of the Lualualei Valley, the affected parcel is devoid of rare, threatened, or endangered species and wetlands. Therefore, the Service will not object to the proposed development.

NOI
Kahumana Phase II
Lualualei Valley, Waianae, Hawaii

We appreciate the opportunity to comment on the NOI and would appreciate a copy of the draft and final EAs for our files. Provided that there are no changes in the project scope or location, no further review or comment by the Service will be required. If you have questions regarding these comments, please contact Fish and Wildlife biologist Arlene Pangelinan at 808/541-3441.

Sincerely,

Brooks Harper
Field Supervisor
Ecological Services

cc: NMFS - PAO, Honolulu
EPA - Region IX, San Francisco
DOFAW, Hawaii
DAR, Hawaii
CWB, Hawaii
CZMP, Hawaii

Benjamin J. Cayetano
GOVERNOR

HERMAN M. AIZAWA, PH.D.
SUPERINTENDENT
[redacted]

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

OFFICE OF THE SUPERINTENDENT

January 10, 1996

'96 JAN 18 A7:50

Mr. Roland D. Libby, Jr., Director
Department of Housing & COMM. DEVELOPMENT
and Community Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Libby:

SUBJECT: Environmental Assessment
Kahumana Phase II

We have reviewed the subject assessment and have determined that the proposed 34-unit rental development for lower income families and the elderly will have an impact on the schools in the Waianae Complex. The proposed rental units will generate the following students:

School	Grades	Projected Students
Leihoku Elementary	K-6	9
Waianae Intermediate	7-8	2
Waianae High	9-12	3

Waianae Intermediate and Waianae High Schools are operating beyond their capacities and report a shortage of classrooms. Leihoku Elementary School is operating at capacity. The Department of Education cannot guarantee the availability of classrooms to accommodate the students from this development.

Should there be any questions, please call the Facilities Branch at 733-4862.

Sincerely,

Herman M. Aizawa, Ph.D.
Superintendent

HMA:hy

cc: A. Suga, OBS
A. Maeda, LDO

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

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

In reply, please refer to

February 7, 1996 95-253/epo

'96 FEB 15 A10:23

DEPT. OF HOUSING & COMM DEVELOPMENT

Mr. Roland D. Libby, Jr., Director
Department of Housing and
Community Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Libby:

Subject: Environmental Assessment
Kahumana Phase II
86-445 Kuwale Road
Lualualei Valley, Waianae, Hawaii
TMK: 8-6-6: 1

Thank you for allowing us to comment on the subject project. The Department of Health would like to see the following areas addressed in the Environmental Assessment:

1. Wastewater disposal

2. Drinking water supply

3. Rainwater runoff during grading and construction, and

4. Noise during construction and between this project and neighboring areas.

Sincerely,

LAWRENCE MIIKE
Director of Health

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

DEPUTY
GILBERT COLOMA-AGARAN

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

'96 JAN 29 P1:40

DEPT OF HOUSING & COMM DEVELOPMENT

January 12, 1996

Roland D. Libby Jr.
Department of Housing and Community Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

LOG NO: 16213
DOC NO: 9601EJ04

Dear Mr. Libby:

SUBJECT: Environmental Assessment Kahumana Phase II
Lualualei, Wai'anae, O'ahu
TMK: 8-6-06:001

Thank you for the opportunity to comment of the proposed Environmental Assessment for the Kahumana Phase II development project. A review of our records shows that there are no known historic sites at the project location. A site visit confirms that portions of the area have been developed with housing and a review of aerial photographs from the late 1970s indicates that this parcel was commercially cultivated. Because it is unlikely that any historic sites would be found in the parcel, we believe that this project will have "no effect" on historic sites.

Aloha

DON HIBBARD, Administrator
State Historic Preservation Division

EJ:jen

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
JERRY M. MATSUDA
GLENN M. OKIMOTO

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

IN REPLY REFER TO:
STP 8.7157

January 4, 1996

'96 JAN -8 A8:16

DEPT. OF HOUSING
& COMM DEVELOPMENT

Mr. Roland D. Libby, Jr.
Director
Department of Housing and Community Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Libby:

Subject: Kahumana Phase II
Environmental Assessment
TMK: 8-6-6:1

Thank you for your transmittal of December 19, 1995.

The proposed 34-unit rental project is not anticipated to have an adverse impact on our State highway transportation facilities.

We appreciate the opportunity to provide comments.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

BENJAMIN J. CAYETANO
Governor

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814-2512

JAMES J. NAKATANI
Chairperson, Board of Agriculture

LETITIA N. UYEHARA
Deputy to the Chairperson

Mailing Address:
P. O. Box 22159
Honolulu, Hawaii 96823-2159

FAX: (808) 973-9613

February 2, 1996

'96 FEB -8 A9:36

DEPT OF HOUSING & COMM. DEVEL. HONOLULU

Mr. Roland D. Libby, Jr., Director
Department of Housing and Community Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Libby:

Subject: Environmental Assessment
Kahumana Phase II
34-unit rental project
TMK: 8-6-06: 1 Waianae, Oahu
Area: 12.38 acres

SUMMARY

This project increases the magnitude of residential use within the intensive agricultural area of Lualualei Homesteads. The project site is in the State Agricultural District and in the County's most restrictive agricultural zone, AG-1 Restricted Agricultural District. The 34 rental units should be located within or immediately adjacent to an existing Urban District/residential area rather than in the middle of a productive agricultural community.

SPECIFIC CONCERNS

The first phase of this development resulted in the construction of 14 "transitional" units for homeless families on 1.5 acres of the property. This construction was made possible by use of Section 201E-210, Hawaii Revised Statutes, which exempts qualified housing programs from all statutes, ordinances, charter provisions, and rules of any governmental agency relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units. The Department of Agriculture suggested

that this first phase be located within the Urban District (see attached letter to the City Department of Housing and Community Development, dated November 25, 1988). Phase II will have approximately the same building density as Phase I, will use the same exemption provisions, and is to be permanent housing targeted for lower-income elderly and families.

There are numerous vegetable farms, a large poultry operation and a large dairy to the north and east of the property. The poultry farm houses 100,000 birds on an eleven-acre site. It is the only pullet (young hen) farm in the State and annually sells about 300,000 birds to Maui and Hawaii poultry farms. The current owner purchased the farm in 1989 from its mainland owners in an over-one million dollar transaction. Manure from this farm is used by area truck crop farmers as a soil supplement. The locally-owned, twelve-acre dairy operation has 400 head and produces about 4.5% of all milk produced and marketed on Oahu.

While the proposed project may "solve" one problem (the housing needs of the low-income elderly and families), it creates another by destabilizing the agricultural community that it is placed in. Firstly, there is the near certainty of nuisance complaints by the project's residents. Noise, dust, insects, and odors resulting from the normal activities of surrounding agricultural businesses may be found to be a nuisance by residents of the proposed rental units. This could lead to economic hardship for the affected agricultural businesses as they attempt to mitigate these nuisances. While the Hawaii Right-to-Farm law (Chapter 165, HRS) protects farmers to some extent from nuisance complaints, we would prefer that conflicts between agriculture and urban/residential uses be avoided. In cases where conflicts do occur, the encroaching use and not the existing farming activities should bear the full cost of implementing mitigating actions.

Secondly, the approval of the project will reinforce the precedent set by the approval and development of the initial project. There will always be the likelihood that other programs like that of Kahumana will be proposed in the Lualualei Homesteads or other agricultural areas. We would be more receptive to projects like Kahumana if they had a substantial agricultural component as an integral part of their programs rather than just being a residential development.

Sites within urban or urban-like areas should be given priority for social welfare projects like Kahumana. If no feasible alternatives exist, then marginally productive agriculturally-zoned properties immediately adjacent to residential-zoned communities should be investigated. Properties in the midst of productive agricultural communities should never be considered for intensive residential development. This is especially true for leeward Oahu with its many livestock

operations, some of which are the result of dislocations from other urbanizing areas around Oahu. Protection of these uses from urban or urban-like encroachment requires a comprehensive approach and avoidance of ad-hoc land use decision-making.

Should you wish to discuss this matter further, please call me at 973-9551, or Earl Yamamoto of the Planning and Development Office, at 973-9466.

Sincerely,

JAMES J. NAKATANI
Chairperson, Board of Agriculture

attachment

kahuphii.e51

November 25, 1988

Mr. Mike Moon, Director
Department of Housing and Community Development
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Moon:

Subject: Environmental Assessment
Kahumana Transitional Housing Project
TMK: 8-6-6: 1
Waianae, Oahu
Area: 12.83 acres

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

According to the preliminary information, the Department of Housing and Community Development (DHCD) proposes to develop a transitional housing project consisting of a multi-purpose activity center, about 18 three- and four-bedroom units, including the placement of seven one- and two-bedroom duplex units onto the parcel.

According to the Land Study Bureau Detailed Land Classification for Oahu, the subject parcel has Overall Productivity Ratings of B62i and E63. By this method of classification, this parcel has good to poor productivity potential for most agricultural uses.

The Soil Conservation Service Soil Survey identifies the predominant soils of the project area as follows:

1. Lualualei clay (LuA), 0 to 2 percent slopes, used for sugarcane, truck crops, pasture, and military installations. The soil capability classification is IIIs, if irrigated (soil having severe limitations because of extreme stoniness or unfavorable texture).

2. Lualualei clay (LuB), 2 to 6 percent slopes, used for sugarcane, truckcrops, pasture and military installations. The soil capability classification is IIIe, if irrigated (soils having severe limitations because of erosion).

3. Lualualei stony clay (LvA), 0 to 2 percent slopes, used for sugarcane, truck crops, pasture and military installations. The soil capability classification is IIIs, if irrigated (soil having severe limitations because of stoniness or unfavorable texture).

The subject parcel is classified as "Prime" according to the Agricultural Lands of Importance to the State of Hawaii (ALISH) system.

The project is situated in an area suited for a wide variety of agricultural uses. This is evidenced by the existence of vegetable farms, dairy and poultry operations and the fact that the parcel itself is the site of a vegetable farm.

These farming activities are frequently the source of fugitive dust, noise, odors and other externalities associated with normal farm operations. The Hawaii Right-to-Farm Act (Chapter 165, Hawaii Revised Statutes) limits the circumstances under which farming activities are deemed nuisances.

We suggest that an alternative site within the Urban District would be a more appropriate place to situate the proposed housing project.

Thank you for the opportunity to comment.

Sincerely,

Yukio Kitagawa

YUKIO KITAGAWA
Chairperson, Board of Agriculture

cc: OEQC

BENJAMIN J. CAYETANO
GOVERNOR

ROY S. OSHIRO
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO

96:PPE/171

January 16, 1996

'96 JAN 18 P3:15

DEPT. OF BUDGET & FIN.
& COMM DEVELOPMENT

The Honorable Roland D. Libby, Jr.
Director
Department of Housing and
Community Development
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Libby:

Re: Environmental Assessment, Kahumana Phase II

Thank you for the opportunity to provide input on the preparation of the environmental assessment for the subject project.

We are generally supportive of your efforts to increase affordable rental housing opportunities for low income families and the elderly. Please keep us apprised of your efforts.

Sincerely,

ROY S. OSHIRO
Executive Director

HFDC

BENJAMIN J. CAYETANO
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822

December 29, 1995

'96 JAN -3 P2:48

DEPT. OF HOUSING
& COMM DEVELOPMENT

Mr. Roland D. Libby, Jr., Director
Department of Housing and Community
Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Libby:

Subject: Environmental Assessment (EA) for Kahumana Phase II, Lualualei Valley, Waianae, Oahu, TMK 8-6-06: 1

We have reviewed the EA for the subject project transmitted with your letter dated December 19, 1995, and have the following comments:

1) We confirm that the 12.38-acre project site, as represented on the vicinity map, is located within the State Land Use Agricultural District. We note that said district is incorrectly identified as "Agriculture" on page 1 of the EA.

2) We note that on page 2 of the EA, the City and Alternative Structures International (ASI) will request exemptions from rules, statutes, and ordinances relating to planning, zoning, and land development for the subject project pursuant to Chapter 201E, HRS, including an exemption from the "State Land Use District Boundary to permit multifamily housing development within the State Urban Boundary."

   It appears that this statement should reflect that the City and ASI will be seeking an exemption from the City Council to permit multifamily housing development on the 12.38-acre project site within the Agricultural District, not the Urban District.

We have no further comments to offer at this time. Thank you for the opportunity to comment on this matter.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

for ESTHER UEDA
Executive Officer

EU:bks

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

JEREMY HARRIS
MAYOR

CHERYL D. SOON
CHIEF PLANNING OFFICER

CAROLL TAKAHASHI
DEPUTY CHIEF PLANNING OFFICER

MH 12/95-2620

January 16, 1996

MEMORANDUM

TO: ROLAND D. LIBBY, JR., DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: CHERYL D. SOON, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR KAHUMANA PHASE II

In response to your department's request of December 19, 1995, we have reviewed the subject project and have the following comments to offer:

1. We confirm that the subject site is designated for Agriculture use on the Waianae Development Plan Land Use Map.

2. The Waianae Development Plan Public Facilities Map shows a symbol for publicly funded drainage improvements (Mailiilii Drainage Canal), beyond six years, in the general vicinity of the subject site.

3. We have no objections to the proposed rental housing project for lower-income senior citizens and families, provided that facilities and utilities are adequate.

Should you have any questions, please contact Matthew Higashida of our staff at 527-6056.

Cheryl D. Soon

CHERYL D. SOON
Chief Planning Officer

CDS:js

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

CHARLES O. SWANSON
DIRECTOR

12/95-05935R

January 19, 1995

96 JAN 22 P2:29

DEPT. OF HOUSING & COMM DEVELOPMENT

MEMORANDUM

TO: ROLAND D. LIBBY, JR., DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: CHARLES O. SWANSON, DIRECTOR

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR KAHUMANA PHASE II

In response to your memorandum dated December 19, 1995, we reviewed the information provided and have the following comments regarding the proposed project:

1. All roadways serving this project should be wide enough to allow for two-way traffic.

2. Adequate sight distance should be provided at the access for the project at Lualualei Homestead Road.

3. Construction plans for work within the City's right-of-way should be provided to this department for review and approval.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Systems Planning Division at Local 6976.

F. Tamayasu
for CHARLES O. SWANSON

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

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI
DIRECTOR AND BUILDING SUPERINTENDENT

ISIDRO M. BAQUILAR
DEPUTY DIRECTOR AND BUILDING SUPERINTENDENT

PB 96-28

January 17, 1996

'96 JAN 17 P1:25

DEPT. OF HOUSING
& COMM DEVELOPMENT

MEMO TO: ROLAND D. LIBBY, JR., DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: RANDALL K. FUJIKI
DIRECTOR AND BUILDING SUPERINTENDENT

SUBJECT: ENVIRONMENTAL ASSESSMENT
KAHUMANA PHASE II

This is in response to your memo dated December 19, 1995 relative to the subject matter.

We have reviewed the preliminary information and have no comments to offer.

for RANDALL K. FUJIKI
Director and Building Superintendent

cc: G. Tamashiro

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

JEREMY HARRIS
MAYOR

KENNETH E SPRAGUE
DIRECTOR AND CHIEF ENGINEER

DARWIN J HAMAMOTO
DEPUTY DIRECTOR

ENV 96-003

January 3, 1996

'96 JAN -3 P3:00

DEPT OF HOUSING
& COMM DEVELOPMENT

MEMORANDUM:

TO: ROLAND D. LIBBY, DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: for KENNETH E. SPRAGUE
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL ASSESSMENT (EA)
KAHUMANA PHASE II
TMK: 8-6-6: 1

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

1. The EA should address existing and proposed street and access improvements.

2. The EA should indicate the ownership of the gulch.

3. The EA should discuss mitigation measures to minimize soil sediment and discharge of other pollutants during construction.

4. Provide adequate setbacks for septic tank which is located adjacent to drainageway.

5. A drainage report should be submitted to the Drainage Section, Division of Engineering, for review and approval.

If you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at Local 4150.

90151-17c

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

DONA L. HANAIKE
DIRECTOR

ALVIN K.C AU
DEPUTY DIRECTOR

January 8, 1996

'96 JAN -9 A7:59

DEPT. OF HOUSING
& COMM. DEVELOPMENT

TO: ROLAND D. LIBBY, DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: DONA L. HANAIKE, DIRECTOR

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR KAHUMANA PHASE II
LOW INCOME AND SENIOR HOUSING
86-445 KUWALE ROAD, LUALUALEI VALLEY
WAIANAE, OAHU, HAWAII
TAX MAP KEY 8-6-006:001

This is in response to your December 19, 1995 memorandum requesting our review and comments for the above-described project.

Since the closest park is over two and one-half miles away from the project site, we would suggest some amount of on-site recreation space be provided for residents of the development project.

Thank you for the opportunity to review this project.

If you have any questions, please contact Lester Lai of the Advance Planning Branch at extension 4696.

For DONA L. HANAIKE
Director

DLH:ei

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

PHONE (808) 527-6180

FAX (808) 533-2714

January 16, 1996

'96 JAN 16 P2:42

DEPT. OF HOUSING & COMM. DEVELOPMENT

TO: ROLAND D. LIBBY, JR., DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR LETTER OF DECEMBER 19, 1995 ON THE ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED KAHUMANA PHASE II PROJECT, LUALUALEI VALLEY, WAIANAE, OAHU, HAWAII, TMK: 8-6-6: 1

Thank you for the opportunity to review and comment on the EA for the Kahumana Phase II project. We have the following comments to offer:

1. There is an existing 1½-inch water meter serving the subject parcel.

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

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

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

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

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

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

96/01-175

FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR

ANTHONY J. LOPEZ, JR.
FIRE CHIEF

ATTILIO K. LEONARDI
FIRE DEPUTY CHIEF

January 5, 1996

'96 JAN -9 A7:59

DEPT. OF HOUSING
& COMM. DEVELOPMENT

TO: ROLAND D. LIBBY, DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: ANTHONY J. LOPEZ, JR., FIRE CHIEF

SUBJECT: ENVIRONMENTAL ASSESSMENT
KAHUMANA PHASE II

We have reviewed the subject material provided and foresee no adverse impact in Fire Department facilities or services.

Access for fire apparatus, water supply and building construction shall be in conformance to existing codes and standards.

Should you have any questions, please call Assistant Chief Arthur Ugalde of our Administrative Services Bureau at 831-7774.

ANTHONY J. LOPEZ, JR.
Fire Chief

AJL/TKP:ny

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

JEREMY HARRIS
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
LEE DONOHUE
DEPUTY CHIEFS

OUR REFERENCE BS-DL

January 3, 1996

'96 JAN -4 P2:48

DEPT. OF [illegible]
& COMM DEVELOPMENT

TO: ROLAND D. LIBBY, JR., DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: MICHAEL S. NAKAMURA, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: ENVIRONMENTAL ASSESSMENT
KAHUMANA PHASE II

This is in response to your memorandum of December 19, 1995, requesting comments relative to the preparation of an environmental assessment for the subject project.

This project should have no significant impact on the operations of the Honolulu Police Department.

Thank you for the opportunity to comment.

MICHAEL S. NAKAMURA
Chief of Police

By Eugene Uemura
EUGENE UEMURA, Assistant Chief
Administrative Bureau

DEPARTMENT OF HUMAN RESOURCES
CITY AND COUNTY OF HONOLULU
STANDARD FINANCE PLAZA
715 SOUTH KING STREET
HONOLULU HAWAII 96813

JEREMY HARRIS
MAYOR

SALVATORE S LANZILOTTI, ED.D.
DIRECTOR

Michael Amii
DEPUTY DIRECTOR

ADMINISTRATION
2ND FLOOR (808) 527-5311
FAX (808) 523-4074

ELDERLY AFFAIRS DIVISION
HONOLULU COMMITTEE ON AGING
5TH FLOOR (808) 523-4781

WORKHAWAII DIVISION
5TH FLOOR (808) 523-4102

SPECIAL PROJECTS SECTION
HONOLULU COUNTY COMMITTEE ON THE STATUS OF WOMEN
MAYOR'S COMMITTEE FOR PERSONS WITH DISABILITIES
MAYOR'S CHILD CARE ADVISORY BOARD
5TH FLOOR (808) 527-6264

January 9, 1996

'96 JAN 22 A10:19

DEPT. OF HOUSING
& COMM DEVELOPMENT

MEMORANDUM

TO: ROLAND D. LIBBY, DIRECTOR
DEPARTMENT OF HOUSING & COMMUNITY DEVELOPMENT

FROM: SALVATORE S. LANZILOTTI, Ed.D., DIRECTOR
DEPARTMENT OF HUMAN RESOURCES

SUBJECT: ENVIRONMENTAL ASSESSMENT - KAHUMANA PHASE II

The Department of Human Resources has reviewed the subject matter cited above and has no objections to the proposed 34-unit rental project for lower income families and senior citizens on 12.38 acres at 86-445 Kuwale Road, Waianae, Oahu (TMK: 8-6-6: 1).

As our department is particularly concerned with the displacement of families that are part of the transitional housing program at Ohana Ola O' Kahumana that currently occupies a portion of the subject parcel, we are pleased that these families will be provided with the opportunity to graduate to a more stable and permanent housing environment through the Kahumana Phase II project.

Thank you for the opportunity to comment on this matter.

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

FELIX B. LIMTIACO
DIRECTOR

CHERYL K. OKUMA-SEPE
DEPUTY DIRECTOR

In reply refer to:
WCC 95-60

December 29, 1995

MEMORANDUM

TO: MR. ROLAND D. LIBBY, JR., DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: FELIX B. LIMTIACO, DIRECTOR
DEPARTMENT OF WASTEWATER MANAGEMENT

SUBJECT: **ENVIRONMENTAL ASSESSMENT FOR KAHUMANA PHASE II**
LUALUALEI VALLEY, WAIANAE, OAHU, HAWAII
TAX MAP KEY: 8-6-006: 001

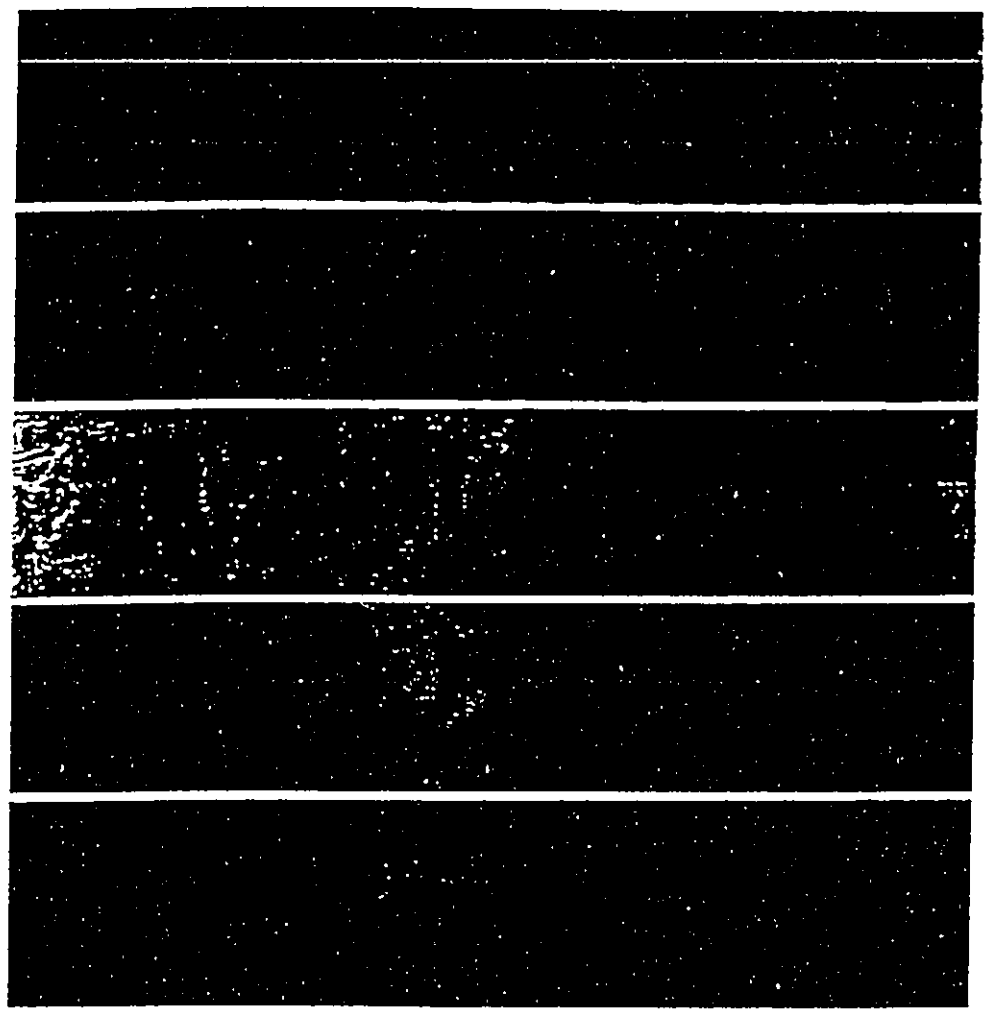
We have no objections to the development of a 34-unit rental project for lower-income senior citizens and families on a 12.38-acre site located at 86-445 Kuwale Road. There are no City sewers in the subject area. The proposal calls for a private system of septic tanks, siphon dosing chambers, and absorption fields under the jurisdiction of the State Department of Health.

If you have any questions, please contact Ms. Tessa Yuen of the Service Control Branch at 523-4957.

Cheryl K. Okuma-Sepe
FELIX B. LIMTIACO
Director

Geotechnical Report

Appendix B



GEOTECHNICAL INVESTIGATION
KAHUMANA RENTAL HOUSING PROJECT
TMK: 8-6-06:01 (LOT 146-A)
LUALUALEI HOMESTEAD ROAD
WAIANAE, OAHU, HAWAII

Job Number 04402-139-011
October 23, 1995

DAMES & MOORE

GEOTECHNICAL INVESTIGATION
KAHUMANA RENTAL HOUSING PROJECT
TMK: 8-6-06:01 (LOT 146-A)
LUALUALEI HOMESTEAD ROAD
WAIANAE, OAHU, HAWAII

Job Number 04402-139-011
October 23, 1995

DAMES & MOORE

DAMES & MOORE
1050 QUEEN STREET, SUITE 204, HONOLULU, HAWAII 96814
(808) 593-1116 FAX: (808) 593-1198

October 23, 1995

Mr. Rodney O. Hirata, AIA
Project Manager
Urban Works
831 Pohukaina Street, Suite E1
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Six copies of our report, "Geotechnical Investigation, Kahumana Rental Housing Project, TMK: 8-6-06:01 (Lot 146-A), Lualualei Homestead Road, Waianae, Oahu, Hawaii," are submitted herewith.

The scope of our work was defined in our proposal dated July 13, 1994, and this Geotechnical Investigation has generally conformed to the scope described in the proposal.

The proposed project is feasible from a geotechnical standpoint. The onsite soils appear dense and stiff from a depth of one foot below the existing ground surface and the proposed buildings may be supported on shallow footings. There are areas of highly expansive clays onsite that are not suitable to support building footings nor for the construction of absorption fields that are being planned for onsite wastewater disposal. Removal of these clays and replaced with non-expansive, granular soils is necessary within the building or absorption field areas. Our findings and recommendations are presented in the body of the report.

Selected soil samples were used in laboratory testing, and the remaining ones will be kept for a period of time for possible inspection and examination. Unless requested otherwise, they will be discarded three months from this date.

It has been a pleasure performing this assignment for you. If you have any questions regarding this report, please feel free to contact us at (808) 593-1116 for clarification.

Very truly yours,

DAMES & MOORE

C. Garry Lay, P.E.
Manager of Honolulu Office

CGL/ln (6 copies submitted)

(HON-1013:04402-139-0106-011)

TABLE OF CONTENTS

1.0 INTRODUCTION

This report presents the results of the geotechnical investigation, the foundation design recommendations, and the percolation test results for the proposed Kahumana Rental Housing Project. The City and County of Honolulu, Department of Housing and Community Development plans to assist the Waianae-based group, Alterative Structures International, to construct one and two-story residential structures with one, two, and three bedroom units, and other associated site improvements. The site is located in Lualualei, Waianae, Oahu, Hawaii. The general location of the site is shown on the Site Location Map, Figure 1.

2.0 PROJECT DESCRIPTION

The project site is located on the Lualualei Homestead, Waianae, Oahu, Tax Map Key: 8-6-06:1. The site is located on a portion of Lot 146-A. The lot is a 1,300-foot by 400-foot rectangle located north of Lualualei Homestead Road and west of Kuwale Road. The agricultural zoned (AG-1) site consists of 12,382 acres with a frontage on Kuwale Road of 400 feet, and a 44-foot wide by 440-foot long access strip from the southwest corner of the site to Lualualei Homestead Road, creating a flag shaped lot.

Based on preliminary information provided, the proposed project will consist of fourteen, one and two-story, wood-framed residential structures with a total of 34, one, two, and three bedroom units. Depending on funding, the project may include a one-story, wood-framed community center consisting of a meeting room, an administration office, and a day care center. The residential units will have raised floor construction while the community center will have slab-on-grade floor construction. In addition, absorption fields will be utilized for onsite wastewater disposal. Other site improvements will likely include paved access roads and parking lots, utilities, landscaping, walkways, and perimeter fencing. The project layout is shown on the Plot Plan, Figure 2.

3.0 PURPOSE AND SCOPE OF WORK

The purpose of this geotechnical investigation is to explore the subsurface conditions, evaluate the engineering as well as percolation characteristics of the materials encountered, and develop appropriate geotechnical recommendations for the design and construction of the proposed Kahumana Rental Housing Project. The scope of our services presented herein was limited to conventional geotechnical investigation and did not include any environmental/hazardous waste assessment or evaluation.

The following scope of services were provided in general accordance to our proposal dated July 13, 1994.

1. Reviewed available published and unpublished reports and geologic maps of the area.
2. Conducted stereoscopic examination of available aerial photographs of the site.
3. Drilled, logged, and sampled twelve (12) exploratory borings.
4. Conducted percolation testing in two (2) selected borings.
5. Performed soil mechanics laboratory testing on selected soil samples for identification and engineering properties.
6. Performed engineering analyses based on data from field exploration, percolation testing, and laboratory testing to derive recommendations for grading plans, design of foundation, pavement, and an onsite wastewater disposal system.
7. Prepared this report to summarize our findings, conclusions, and recommendations.

4.0 FIELD EXPLORATION AND LABORATORY TESTING

4.1 FIELD EXPLORATION AND PERCOLATION TESTING

A total of twelve (12) exploratory borings were drilled, ten (10) in the building areas (B-1 through B-10), and two (2) for percolation testing (P-1A and P-2). The percolation tests were conducted to determine typical percolation rates of the onsite soils for the purpose of siting as well as designing the absorption fields for onsite wastewater disposal. The boring locations are shown on the Plot Plan, Figure 2. A more detailed description of the field exploration program, percolation testing and the Log of Borings are presented in Appendix A.

The soil samples obtained from the borings were transported back to the Dames & Moore soil mechanics laboratory in Honolulu for further examination and testing.

4.2 LABORATORY TESTING

A laboratory testing program was performed to verify visual field classifications and to determine pertinent geotechnical engineering properties of the subsurface materials encountered in our borings. A description of the laboratory test procedures and the results of the laboratory testing are presented in Appendix A. The tests performed included in-situ moisture content and dry density determination, sieve analysis, direct shear test, compaction test, California Bearing Ratio (CBR), consolidation test, and expansion index.

5.0 SITE CONDITIONS

5.1 GENERAL GEOLOGY

The island of Oahu was formed by the volcanic activity of two large shield volcanoes, the Koolau and the Waianae Volcanoes. The Koolau and Waianae Volcanic Shields were built during the late Pliocene and early Pleistocene by thin-bedded, basaltic lava flows from rift zones that roughly parallel the existing mountain ranges. The Waianae Volcano became extinct when the Koolau Volcano was still active. The site is located on the alluvial plain below the flank of the Waianae volcanic range in Lualualei Valley. The soil in this area mainly consists of older alluvium comprised of basaltic gravels with silt and clay layers.

5.2 SURFACE CONDITIONS

The project site is located on 12,382 acres of agricultural zoned land. An existing transitional housing project sits on the eastern portion of the site with access from Kuwale Road. It consists of fifteen units in eight wooden-framed buildings, arranged in a circular formation. The center of the circle is occupied by a day care building. The project is serviced by a septic tank/soil absorption system and occupies approximately 1½ acres, exclusive of the sewage treatment facilities.

An existing dry gulch transverses the property from east to west. Several large stockpiles of soils, boulders, debris, organic mulching materials, and other possible hazardous debris were observed throughout the southern portion of the site. The site is also covered with grasses, Kiawe trees, and Haole Koa trees.

The site slopes gently towards the dry gulch on both sides. Within the area of the proposed housing, the site slopes gently from the southeast to the northwest with surface elevations ranging from approximately 50.0 feet Mean Sea Level (MSL) to 35.0 feet MSL. For the access road, the surface elevations gently slopes from approximately 53.5 feet MSL at the intersection with Lualualei Homestead Road to 50.0 feet MSL at the beginning of the proposed housing area. The ground surface features of the project site are shown on the Plot Plan, Figure 2.

5.3 SUBSURFACE CONDITIONS

Based on our borings, the subject site is underlain by recent alluvium over older alluvium. The recent alluvium consists of silty to clayey sand and silty to sandy clay. The recent alluvium is about 3 to 5 feet thick with the upper 12 inches typically dry and loose, and becomes denser or

stiffer with depth. The surficial silty clay layer of the recent alluvium encountered in Borings B-1, B-3, B-9, and P-2 is highly expansive and also relatively impermeable. The older alluvium consists of alternating layers of silty to clayey gravels, silty to clayey sand, sandy to clayey silt, and silty clay. The older alluvium is generally dense or stiff with slightly higher moisture content than the upper recent alluvium. Groundwater was not encountered in any of the borings drilled during this investigation. A more detailed discussion of our field exploration and the log of borings are presented in Appendix A.

6.0 DISCUSSION AND RECOMMENDATIONS

6.1 GENERAL

Based on our investigation, we concluded from a geotechnical standpoint that it is feasible to construct the Kahumana Rental Housing Project at the subject site, provided the recommendations presented in this report are fully incorporated into the design and implemented during the grading and construction. The primary geotechnical constraints that will need to be considered at the site are:

- Loose or soft soils are present in the upper one foot across the site. Removal and recompaction of this material within the structural zone will be required to provide a uniform bearing condition. The deeper soil are considered competent and suitable to support building foundations.

- In the vicinity of Borings B-1, B-3, B-9, and P-2, highly expansive clays are present at the surface. Volumetric strains of these clay soils as a result of either swelling (upon wetting) or shrinking (drying) could have an adverse impact on the building foundations. In addition, these clay soils are relatively impermeable and are not considered suitable for the construction of any absorption fields intended for onsite wastewater disposal.

6.2 EARTHWORK

The earthwork anticipated at the site will consist of clearing and grubbing, removal of compressible and expansive soils in the structural areas, subgrade preparation, and placement and compaction of fills.

6.2.1 Clearing and Grubbing

Existing vegetation, trash, debris, stockpiles of soils that contain possible hazardous materials, and other rubbish should be removed, piled, or otherwise disposed of so as to leave the areas that have been cleared with a neat and finished appearance free from debris. No burning shall be permitted on the site unless proper permits are obtained from governing agency.

All significant vegetation and deleterious material such as rubbish, possible hazardous materials, and debris shall be properly disposed of. This removal must be concluded prior to placing fill.

6.2.2 Removal of Compressible Soils and Expansive Soils

In the structural areas for the future residential buildings and the community center, the top 12 inches of soils should be removed to expose the underlying dense or stiff soils. In the areas of Borings B-1, B-3, B-9, and P-2, the upper highly expansive clay soils up to about 4 feet deep should be removed from the building foundation zone. The structural area is hereby defined as the footprint of the structure plus a lateral zone of a minimum of 5 feet.

6.2.3 Scarification and Proofrolling

Following removal of compressible and expansive soils, the exposed ground surface should be ripped or scarified to a depth of about 6 to 12 inches until the surface is free from ruts, hummocks, or other uneven features that would tend to prevent uniform compaction by the equipment to be used.

The scarified ground surface should then be dried or watered as necessary to bring the material to near-optimum moisture content, mixed as required, and compacted by proofrolling with heavy compaction equipment to relative compaction of at least 90 percent.

After proofrolling and prior to receiving fill, the subgrade should be observed and tested by representatives of Dames & Moore.

6.2.4 Fill Materials

Native Soils

Native non-expansive soils free from trash, debris, organic matter, or other deleterious materials may be used as structural fill for the project. The highly expansive clays removed from the

building areas should not be used as structural fill but may be used in the designated non-structural landscape areas.

Oversized Materials

Oversized material defined as rock, or other irreducible material with a maximum dimension greater than 6 inches, should not be buried or placed in fills unless the location, materials, and disposed methods are specifically approved by the geotechnical engineer.

Import

Imported materials for use as fill in the structural areas should conform with the Select Borrow gradation requirements of the City and County of Honolulu. Gradation reports from the commercial quarry should be submitted to the geotechnical consultant for acceptance prior to being brought to the site.

6.2.5 Fill Placement and Compaction

Fill Lifts

Approved fill material should be placed in areas prepared to receive fill in near-horizontal layers not exceeding 6 inches in compacted thickness. The geotechnical consultant may approve thicker lifts if testing indicates the grading procedures are such that adequate compaction is being achieved with lifts of greater thickness. Each layer should be spread evenly and should be thoroughly mixed during spreading to attain uniformity of material and moisture in each layer.

Fill Moisture

Fill layers at a moisture content less than optimum should be watered and mixed, and wet fill layers should be aerated by scarification or should be blended with drier material. Moisture-conditioning and mixing of fill layers should continue until the fill material is at a uniform moisture content at or near optimum.

Compaction of Fill

After each layer has been evenly spread, moisture-conditioned, and mixed, it should be uniformly compacted to a relative compaction of not less than 90 percent for structural areas. The upper 12 inches of subgrade to support pavements should be compacted to at least 95 percent relative

compaction. Compaction equipment should be adequately sized and should be either specifically designed for soil compaction or of proven reliability, to efficiently achieve the specified degree of compaction.

Compaction Testing

Field density and moisture content tests should be performed by Dames & Moore during grading operations. At least one (1) test should be made for each one thousand (1,000) cubic yards or fraction thereof placed, with a minimum of one (1) test per every two (2) feet in fill elevation. The field density and moisture content should be determined using a nuclear density gauge in accordance with ASTM D2922-91 and D3017-88 procedures or by the sand cone method in accordance with ASTM D1556-90 procedure.

6.2.6 Dust and Drainage Control

Dust control and temporary drainage and erosion control measures should be specified by the Civil Engineer and implemented by the grading contractor. All work areas should be maintained free from dust which may cause a nuisance or hazard to others. Air and noise pollution standards and regulation of Department of Health, State of Hawaii should be strictly followed. Finished surface drainage should be directed away from structures and should drain toward approved drainage collection devices.

6.3 FOUNDATION DESIGN

Either shallow continuous or isolated spread footings founded on non-expansive, competent native soils or compacted materials may be used to support the loads of the structure. Expansive clay soils in the vicinity of Borings B-1, B-3, B-9, and P-2 should be removed below the foundation and replaced with compacted, non-expansive imported soils. The following design parameters are recommended for the building foundations.

- Minimum Footing Depth: 12 inches below lowest adjacent grade
- Minimum Footing Width: 12 inches
- Allowable Bearing Capacity: 2,000 pounds per square foot (psf)
- Friction Coefficient: 0.35
- Allowable Passive Resistance: 300 psf/per foot of depth

The allowable bearing pressures recommended above are for the combined total of dead load and live load. These values may be increased by ⅓ for loadings of short duration, such as wind or seismic forces.

Total and differential settlement with the above requirements are anticipated to be about ¾ inch and ½ inch, respectively. The anticipated total and differential settlements are within generally accepted tolerances.

6.4 SLABS-ON-GRADE

Where slab-on-grade floors are used, they should be designed for any special loads to be determined by the structural engineer. Where conventional light floor loading conditions exist, the following minimum recommendations should be used:

- Expansive clay soils beneath the slab-on-grade areas should be removed and replaced with compacted non-expansive imported soils.
- Minimum slab thickness should be four inches.
- The top 6 inches of the slab-on-grade subgrade should be compacted to a minimum of 95 percent relative compaction at a moisture content of near-optimum moisture content. This moisture content should be maintained until placement of crushed rock.
- Slab-on-grade floors should be supported on a minimum of 4 inches of clean, free-draining crushed rock, such as locally available No. 3-B Fine Rock Aggregate (ASTM #67).
- In areas where moisture susceptible floor coverings are used, a moisture barrier consisting of 6-mil Visqueen, underlain by a one inch sand base and covered with a minimum of one inch of sand, should be placed below slabs.

6.5 ABSORPTION FIELDS

The absorption fields should be constructed in areas exposing granular (sands and gravels) soils such as in the areas of Borings P-1, P-1A, B-2, B-4 through B-8 and B-10. The absorption fields constructed near these areas can be sized using a preliminary percolation rates of 7 minutes per inch. Since there are isolated zones of impermeable clays within the site, the geotechnical engineer should be retained to conduct site-specific percolation testing at the locations of the proposed absorption fields to confirm the preliminary data and if necessary, revise the size of the absorption fields according to the actual field testing data. Alternatively, if the absorption fields are to be constructed over the clay areas, the clays should be completely removed to expose the underlying granular soils and the resulting cavity should be backfield with granular soils such as No. 4 Sand. The absorption fields should be designed in accordance with the

requirements of the State Department of Health, Administrative Rule Chapter 11-62, "Wastewater Systems."

6.6 ASPHALTIC CONCRETE PAVEMENTS

The top 6 inches of the soil subgrade below the pavement should be compacted to at least 95 percent relative compaction. Asphaltic concrete pavements for light automobile traffic and parking should be designed with 2½ inches of asphaltic concrete supported on 6 inches of aggregate base course over compacted subgrade or structural fill. All aggregate base course should be compacted to at least 95 percent relative compaction at near-optimum moisture content based on *ASTM D1557-78* method.

6.7 UTILITY TRENCH BACKFILL

Trench excavations for utility pipes should be backfield filled with compacted onsite soils or Select Borrow materials. After the utility pipe has been laid, the space under and around the pipe should be backfield with clean, granular soils, having a sand equivalent of 30 or greater, to at least one foot over the top of the pipe and before the compacted trench backfill is placed on top. All trench backfill should be mechanically compacted to at least 90 percent relative compaction.

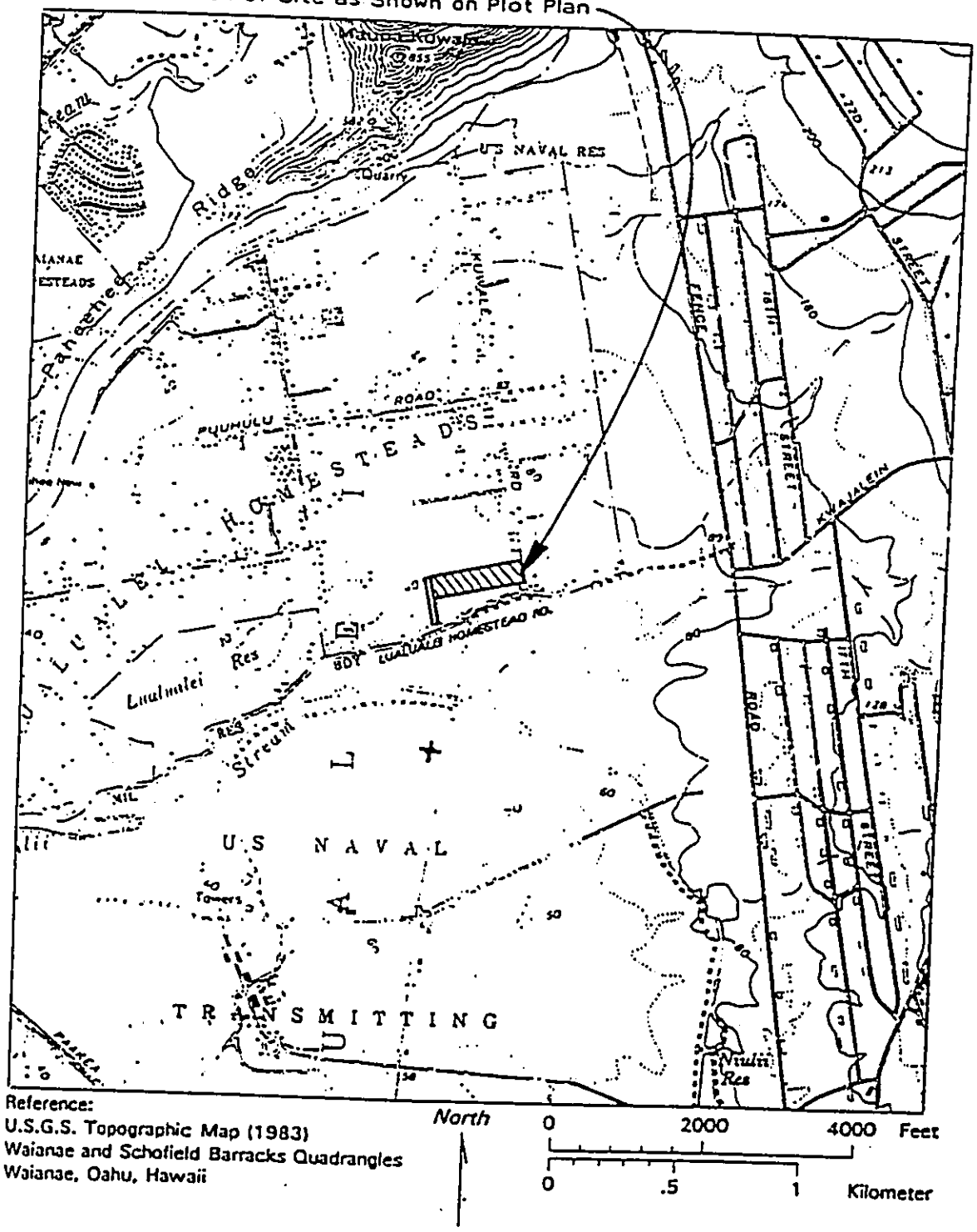
7.0 REVIEW OF PLAN AND SERVICES DURING CONSTRUCTION

The project plans and specifications should be reviewed by Dames & Moore prior to finalization to see that the intent of these recommendations and design considerations are properly reflected in the final design.

During construction, Dames & Moore should be retained to provide geotechnical services during the following:

- After completion of site clearing;
- During removal and recompaction operations;
- During selection of import fill materials;
- During compaction of fill or backfill materials;
- During preparation of structural slab subgrade;
- During construction of the absorption fields;
- During construction of pavements; and
- When any unusual conditions are encountered.

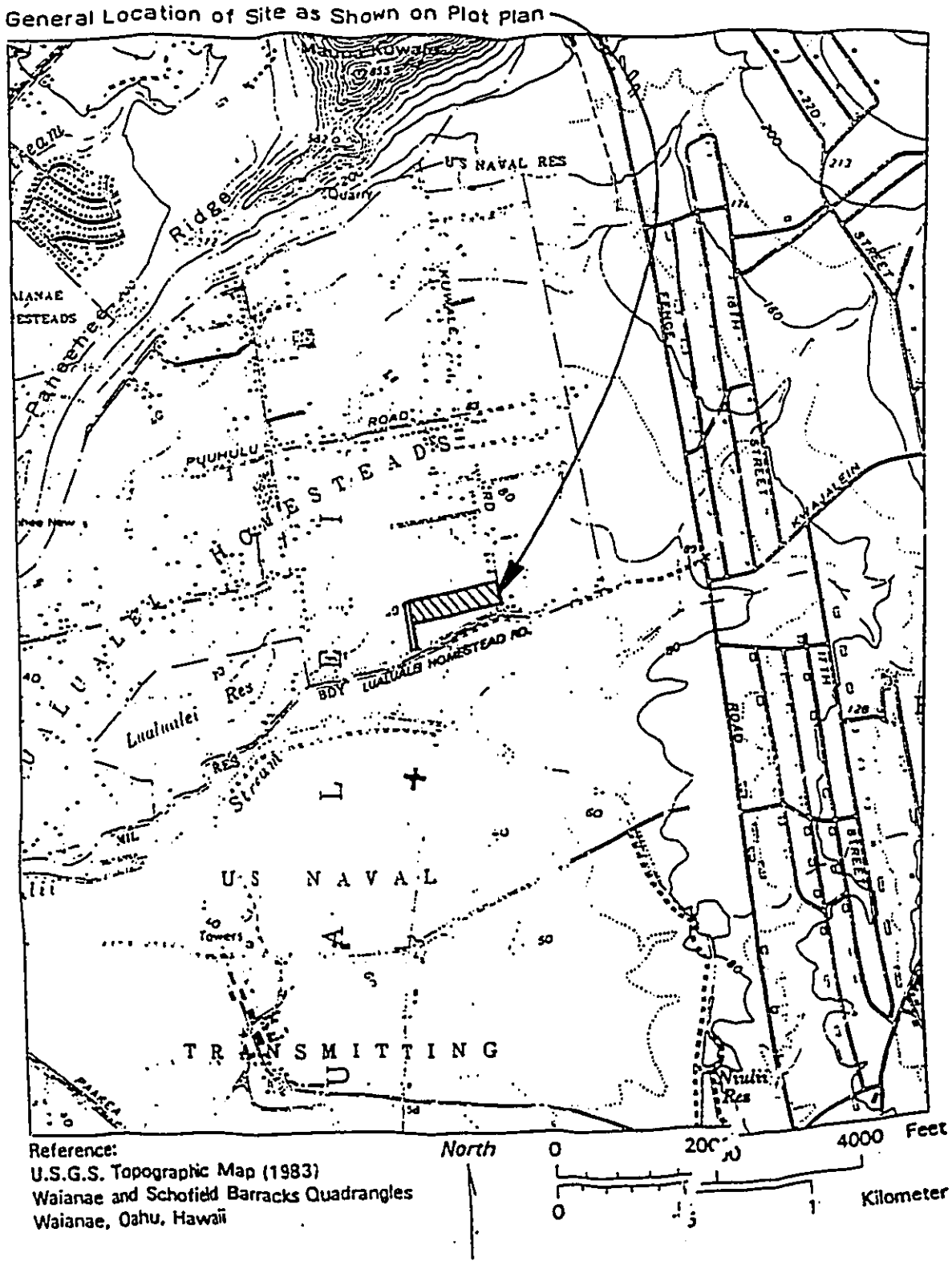
General Location of Site as Shown on Plot Plan



SITE LOCATION MAP

LUALUALEI HOMESTEAD ROAD
WAIANAE, OAHU, HAWAII

DAMES & MOORE
FIGURE 1

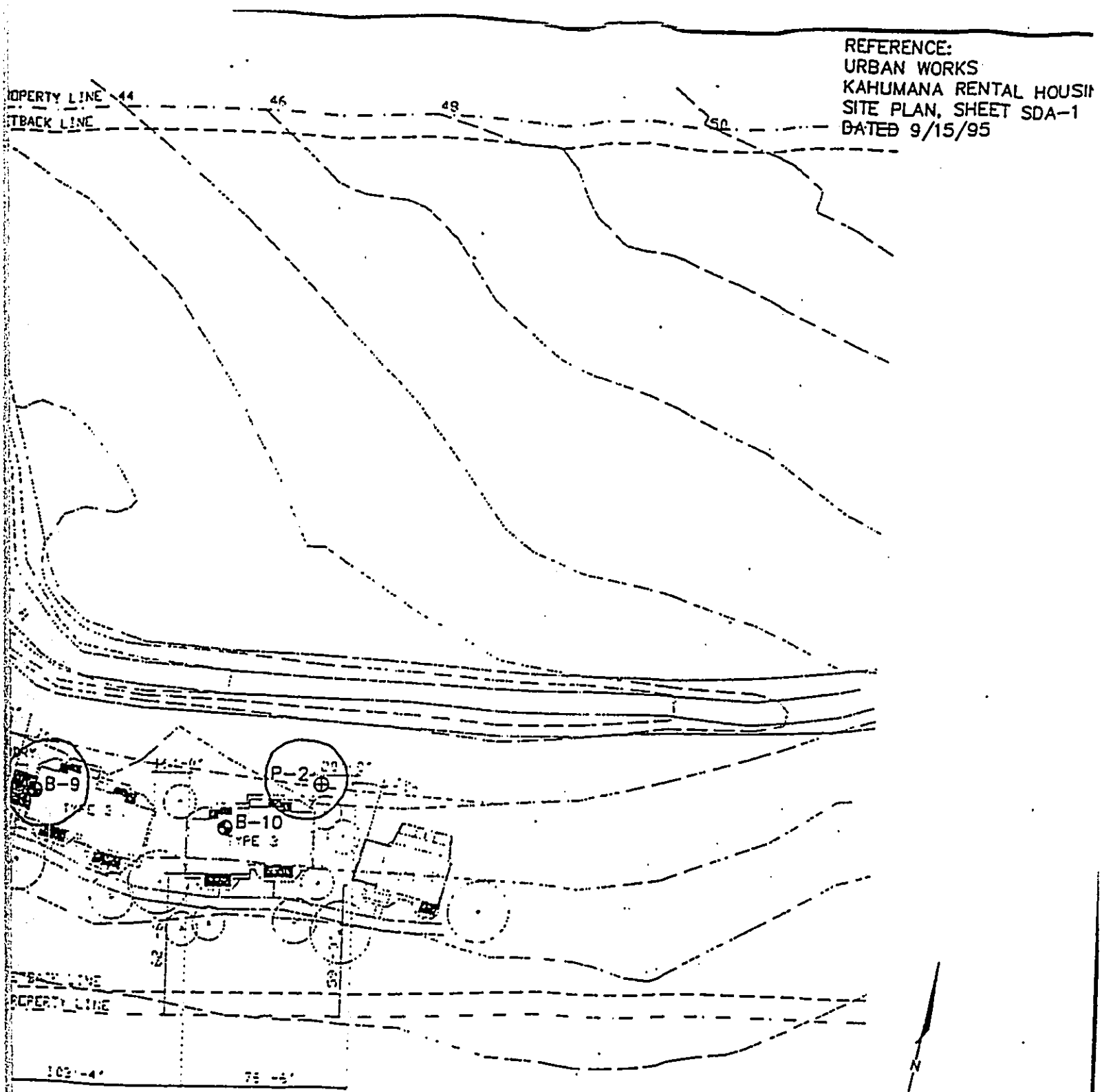


SITE LOCATION MA

LUALUALEI HOMESTEAD RO
WAIANAE, OAHU, HAWAI

DAMES & MOO

FIGURE 1



LEGEND

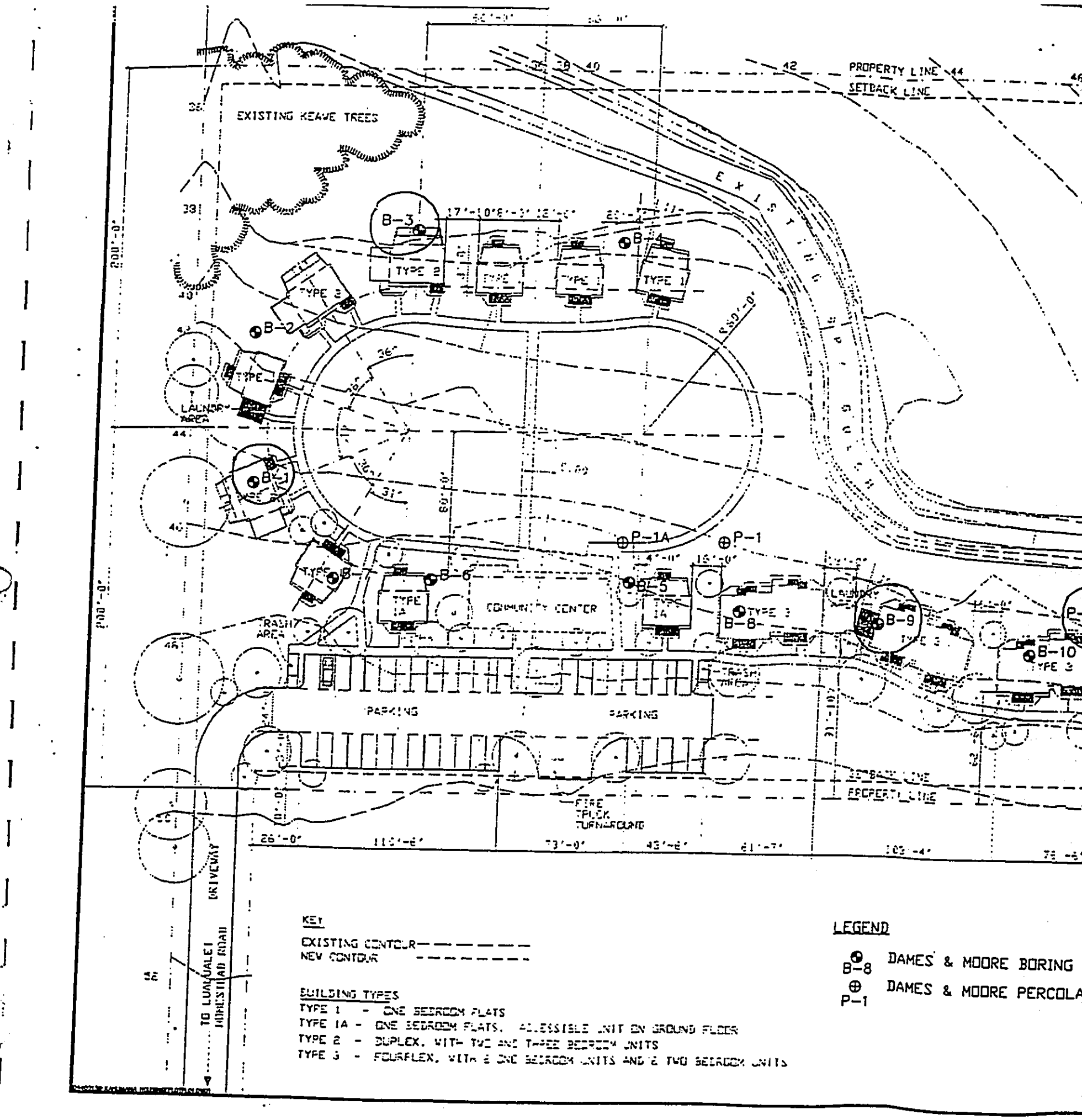
B-8 DAMES & MOORE BORING LOCATIONS

P-1 DAMES & MOORE PERCOLATION TEST LOCATIONS

PLOT PLAN
KAHUMANA HOUSING

DAMES & MOORE

FIGURE 2


EXISTING KEAWE TREES
PROPERTY LINE
SETBACK LINE
EXISTING
B-3
B-4
B-2
B-1
B-6
B-5
B-8
B-9
B-10
P-1A
P-1
TYPE 1
TYPE 1A
TYPE 2
TYPE 3
COMMUNITY CENTER
LAUNDRY
TRASH AREA
PARKING
PARKING
FIRE TRUCK TURNAROUND
SETBACK LINE
PROPERTY LINE
TO LUALUALEI HOMESTEAD ROAD
DRIVEWAY
200'-0"
60'-0"
50'-0"
26'-0"
110'-6"
73'-0"
43'-6"
61'-7"
103'-4"
KEY
EXISTING CONTOUR
NEW CONTOUR
BUILDING TYPES
TYPE 1 - ONE BEDROOM FLATS
TYPE 1A - ONE BEDROOM FLATS, ACCESSIBLE UNIT ON GROUND FLOOR
TYPE 2 - DUPLEX, WITH TWO AND THREE BEDROOM UNITS
TYPE 3 - FOURPLEX, WITH 2 ONE BEDROOM UNITS AND 2 TWO BEDROOM UNITS
LEGEND
B-8 DAMES & MOORE BORING
P-1 DAMES & MOORE PERCOLA

APPENDIX A

Field Investigation

To obtain the subsurface information, ten exploratory and three percolation test borings were drilled from July 27,1995 to August 1, 1995. Exploratory boring depths ranged from 14.3 feet to 20.5 feet, and percolation test boring depths ranged from 3.9 feet to 4.2 feet. Only two of the three percolation test holes were used for testing. The boring locations are shown on the Plot Plan, Figure 2.

With the owner's permission, parts of several large stockpiles containing soils, boulders, and debris; and some tall grasses and small trees were pushed aside using a rented D-977 dozer to other areas within the site. This allowed our truck-mounted Mobile Drill B-53 rig to access the boring locations. Care was taken to minimize the disruption of the existing surface conditions.

Continuous flight augers were used to drill the borings. Soil samples were obtained from the borings using a Dames & Moore "U" type sampler driven by a 140-pound drop hammer falling 30 inches per blow. The Dames & Moore "U" type sampler is shown in Exhibit A-1.

One of our field engineers observed the drilling operation and logged each boring. The retrieved soil samples were packaged and returned to our Honolulu laboratory for testing. The borings were then backfield with in-situ material.

The Log of Borings are presented in the Appendix on Figures A-1.1 through A-1.13. The soils encountered were classified according to the Unified Soil Classification System described on Figure A-2.

Percolation Testing

Two percolation tests were performed at the preliminary locations of the proposed absorption fields in accordance with the Falling Head Test Procedure specified by Hawaii State Department of Health, Wastewater Branch. The test results are presented in Figures A-3 and A-4.

Laboratory Test Results

Selected soil samples were tested to evaluate pertinent classification and engineering properties. The tests included moisture content and dry density determination, mechanical (sieve) analysis,

consolidation test, direct shear test, expansion index, compaction test, and California Bearing Ratio (CBR) test. All testing procedures were performed in accordance to the American Society for Testing Materials (ASTM) standards.. The results of the laboratory tests are presented in the following sections.

Moisture Content and Dry Density

Moisture content and dry density determinations (ASTM D2216-80) were performed on selected soil samples. The results of these tests are presented on the Log of Borings, Figures A-1.1 through A-1.13 in this Appendix.

Mechanical Analysis

Mechanical (sieve) analysis (ASTM D422-84) was performed to aid in the classification of the onsite soils. The results of the two gradation analyses are presented on Figure A-5, Gradation Curve.

Consolidation Test

One consolidation test (ASTM D2435-80) was performed on a selected soil sample. The test results are presented on Figure A-6. The method of performing this test is explained on Exhibit A-2, Method of Performing Consolidation Tests.

Direct Shear Test

One direct shear test (ASTM D3080-72) was performed on selected undisturbed samples which were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transferring of the sample to the shear box, and reloading the sample, pore pressures set up in the sample due to the transfer were allowed to dissipate for a period of approximately one hour prior to application of the shearing force. The samples were tested under various normal loads, a different specimen being used for each normal load. The samples were sheared in a motor-driven, strain-controlled, direct-shearing apparatus at a strain rate of 0.05 inch per minute. The peak and residual shear values (relatively constant strength at large strains) were recorded. The method of performing the test is described on Exhibit A-3, Method of Performing Direct Shear and Friction Tests. The test results were plotted on Figure A-7, Direct Shear Test Report.

Expansion Index Test

The expansion potential of a representative sample was evaluated by the Expansion Index Test, (ASTM D4829-88). The specimen was molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1 inch thick by 4-inch diameter specimen was loaded to an equivalent 144 psf surcharge and was inundated with tap water until volumetric equilibrium is reached. The results of this test are presented below:

Description	Depth (ft.)	Compacted Moisture (%)		Compacted Density (pcf)		Volumetric Swell (%)	Expansion Index	Expansion Classification
		Before	After	Before	After			
Silty Clay	0-2	16.2	47.0	91.5	75.6	21.1	211	Very High

Compaction Test

A compaction test was performed on a bulk sample of the surficial brown silty clay. The results are presented on Figure A-8.

California Bearing Ratio Test

One California Bearing Ratio (CBR) test (ASTM D1883-87) was performed on a surficial bulk sample. The test results are presented below.

Sample Description	Moisture Content at Compaction (%)	Dry Density (pcf)	Percent Compaction (%)	CBR Values at Penetration of	
				0.1 Inch	0.2 Inch
Silty Clay at 0.5 to 1.0 feet	22	102	96	2	2

The following Figures and Exhibits are attached to complete the Appendix:

Figures A-1.1 through A-1.13	-	Log of Borings B-1 through B-10, P-1, P-1A, and P-2
Figure A-2	-	Unified Soil Classification System
Figure A-3 and A-4	-	Percolation Test Results
Figure A-5	-	Gradation Curve
Figure A-6	-	Consolidation Test Data
Figure A-7	-	Direct Shear Test Report
Figure A-8	-	Compaction Test Data
Exhibit A-1	-	Dames & Moore Soil Sampler Type U
Exhibit A-2	-	Method of Performing Consolidation Tests
Exhibit A-3	-	Method of Performing Direct Shear and Friction Tests

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-2 (Page 1 of 1)

SURFACE ELEVATION 41.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	RQD % or (RQI) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
4.0	112.0				108	■			SM	Dark brown silty clayey fine to medium grained basaltic sand with some coarse subangular basaltic gravel, trace rootlets and wood fragments, medium dense to dense, dry (recent alluvium)
9.3	107				158/11"	■	5		GM	Brown and gray silty gravel with fine to coarse grained basaltic sand and coarse subangular basaltic gravel, dense, dry (older alluvium)
7.3					100/5"	⊠	10			grades dark brown, more gravel and cobbles
23.0	103.5				197	■	15		ML	Mottled brown and gray clayey fine to coarse grained basaltic sandy silt, hard, dry to trace moist (older alluvium)
										grades brown to yellowish red, more sandy

Boring completed at 16.5 feet on 07-27-95
Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ◪ - Standard penetration test sample (split-spoon sampler)
- ⊠ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-1.2

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-3 (Page 1 of 1)

SURFACE ELEVATION 38.3 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	ROD % or (RQI) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
17.8	85.1				146/7"	■			CH	Dark brown silty clay with coarse subangular basaltic gravel, trace rootlets, stiff, dry to trace moist (recent alluvium)
										cobble at 3 feet
11.0	114.0				168	■	5		GM	Mottled brown to brownish yellow and gray silty clayey gravel with fine to coarse grained basaltic sand and fine to coarse subangular to subrounded basaltic gravel, very dense, dry to trace moist (older alluvium)
26.5	89.2				199/9"	■	10		ML	Dark brown to brown fine to medium grained basaltic sandy clayey silt, trace rootlets, stiff, dry (older alluvium)
33.1	90.2				69	■	15		CH	Dark brown silty clay, trace rootlets, very stiff, trace moist to dry (older alluvium)
										Boring completed at 16.0 feet on 07-27-95 Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ◪ - Standard penetration test sample (split-spoon sampler)
- ⊠ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-1.3

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-4 (Page 1 of 1)

SURFACE ELEVATION 38.4 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	ROD % or (RQD) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
8.1	117.0				200/9"	■			GM	Brown to gray silty clayey fine to coarse subangular to subrounded basaltic gravel and cobbles, trace rootlets, very dense, dry (older alluvium)
7.0					100/3.5"	⊠	5			boulders and cobbles between 4 to 8 feet
20.3	97.0				138	■	10		GM	Brown silty clayey gravel with fine to coarse grained basaltic sand and fine subrounded to subangular basaltic gravel, trace rootlets, dense to very dense, dry (older alluvium)
									ML	Brown fine grained basaltic sandy clayey silt, stiff, dry to trace moist (older alluvium)
42.0	81.0				56	■	15		CH	Dark brown silty clay, very stiff, trace moist (older alluvium)
37.0	87.0				86	■	20			grades dark brown to yellowish red, very stiff to hard

Boring completed at 20.5 feet on 07-28-95
Groundwater not encountered

NOTES:

- ■ - Relatively undisturbed sample
- ▨ - Disturbed sample
- ▩ - Sample lost during extraction
- ⊠ - Standard penetration test sample (split-spoon sampler)
- ⊠ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-1.4

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-5 (Page 1 of 1)

SURFACE ELEVATION 45.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO							
MOISTURE CONTENT %	DRY DENSITY (pcf)	ROD % or (RQI) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS
					39/3"				SM
19.0	106.0				195/9"				
30.2	91.0				192/7"		5		ML
7.6					100/3"		10		GM
10.0	118.5				179/10"				ML
31.5	88.8						15		CH

DESCRIPTION

Dark brown to brown silty sand with fine subrounded to angular basaltic gravel and cobbles, dense, dry (older alluvium)

Dark brown to brown fine to coarse grained basaltic sandy clayey silt with some fine subrounded basaltic gravel, stiff, dry to trace moist (older alluvium)

Dark brown silty clayey gravel with fine to coarse grained basaltic sand, fine to coarse subrounded to angular basaltic gravel and cobbles, very dense, dry to trace moist (older alluvium)

cobbles/boulder between 10 and 13 feet

Brown fine to medium grained basaltic sandy clayey silt with trace fine subrounded basaltic gravel, stiff, dry to trace moist (older alluvium)

Dark brown to olive gray silty clay, very stiff, dry to trace moist (older alluvium)

Boring completed at 15.3 feet on 07-28-95
Groundwater not encountered

NOTES:
- Relatively undisturbed sample
- Disturbed sample
- Sample lost during extraction
- Standard penetration test sample (split-spoon sampler)
- Standard penetration test sample no recovery
- Core run

DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-L5

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-6 (Page 1 of 1)

SURFACE ELEVATION 47.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	ROD % or (RQD) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
23.1	87.4				97	■			SM	Dark brown to brown silty clayey sand with fine subangular to subrounded basaltic gravel, dense, dry (older alluvium)
20.4	77.7				220	■	5		SM	Dark brown silty clayey fine to coarse grained basaltic sand with fine angular to subangular basaltic gravel, very dense, dry (older alluvium)
14.0	106.1				171/10"	■			ML	Dark brown to brownish yellow sandy silt with fine subrounded basaltic gravel and fine to coarse grained basaltic sand, stiff, dry to trace moist (older alluvium)
							10		GM	Brown to gray silty clayey gravel with fine to coarse grained basaltic sand and fine to coarse subangular to subrounded basaltic gravel, very dense, dry to trace moist (older alluvium)
10.4	101.4				100/4"	—				Boring completed at 14.3 feet on 07-31-95 Groundwater not encountered

NOTES:

■ - Relatively undisturbed sample
⊘ - Disturbed sample
□ - Sample lost during extraction
⊠ - Standard penetration test sample (split-spoon sampler)
⊠ - Standard penetration test sample no recovery
I - Core run
DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-1.6

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-7 (Page 1 of 1)

SURFACE ELEVATION 47.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	ROD % or (RQD) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
6.0	115.3				136/9"	■	5		GM	Dark brown to gray silty clayey gravel with fine to coarse grained basaltic sand and fine subangular to subrounded basaltic gravel and cobbles, dense, dry (older alluvium)
										cobbles at 1.5, 3 and 4 feet
11.5					184/8"	⊠				cobbles at 6 to 9 feet
9.4	113.0				211	■	10		ML	Brown to brownsih yellow sandy silt with fine to coarse grained basaltic sandy clayey fine to coarse subrounded basaltic gravel, very stiff, dry (older alluvium)
										grades more cobbles
3.3					100/1"	—	15			Boring completed at 15.1 feet on 07-31-95 Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ☑ - Standard penetration test sample (split-spoon sampler)
- ☑ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-1.7

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION. Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-8 (Page 1 of 1)

SURFACE ELEVATION 45.0 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	RQD % or (RQI) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
6.6	115.2				182/7"	■			SM	Brown silty clayey sand with fine subangular to subrounded basaltic gravel, dense, dry (older alluvium)
18.6					100/3"	⊠	5			grades more cobbles
4.0					100/1"	—	10			grades more cobbles and boulders
24.2	94.6				130	■	15		ML	Mottled brown to yellowish red and gray fine to coarse grained basaltic sandy clayey silt with trace fine subangular basaltic gravel, very stiff, dry to trace moist (older alluvium)
									CH	Dark brown silty clay, hard, dry to trace moist (older alluvium)

Boring completed at 18.5 feet on 07-31-95
Groundwater not encountered

NOTES:

■ - Relatively undisturbed sample
▨ - Disturbed sample
▩ - Sample lost during extraction
■ - Standard penetration test sample (split-spoon sampler)
⊠ - Standard penetration test sample no recovery
I - Core run
DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-18

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION. Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-9 (Page 1 of 1)

SURFACE ELEVATION 45.5 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	ROD % or (RQD) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
16.3	89.0				52	■			CH	Dark brown silty clay with fine to coarse grained basaltic sand and trace fine subangular basaltic gravel, very stiff, dry to trace moist (recent alluvium)
8.0	101.1				101	■	5		SM	Brown to brownish yellow silty sand with fine subangular to subrounded basaltic gravel, dense, dry (older alluvium)
20.0	83.0				193	■	10		SM	Brown to dark brown clayey fine to coarse grained basaltic silty sand with trace fine subangular to subrounded basaltic gravel, dense, dry (older alluvium)
									CH	Dark brown to olive gray silty clay, very stiff, trace moist to dry (older alluvium)
33.2	87.0				62	■	15			
										Boring completed at 16.5 feet on 07-31-95 Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ☑ - Standard penetration test sample (split-spoon sampler)
- ☑ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-1.9

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING B-10 (Page 1 of 1)

SURFACE ELEVATION 45.5 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	ROD % or (RQD) %	RECOVERY %	CORE TYPE	BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
6.0	112.0				201	■			SM	Brown silty sand with fine to coarse grained basaltic sand, fine to coarse subangular to subrounded basaltic gravel, very dense, dry (older alluvium)
7.5					100/4"	⊠	5		CH	grades more gravels and cobbles Brown to dark brown silty clay with fine to medium grained basaltic sand, trace rootlets, stiff, dry (older alluvium)
27.2	88.4				100	■	10			
									CH	Dark brown silty clay, stiff, trace moist to dry (older alluvium)
46.6	82.3				118	■	15			

Boring completed at 16.5 feet on 08-01-95
Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ◪ - Standard penetration test sample (split-spoon sampler)
- ⊠ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY: 140-lb. weight dropping 30 inches
Soil Classification: Laboratory (L) or Visual (V)

LOG OF BORING

Dames & Moore

FIGURE A-1.10

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING P-1 (Page 1 of 1)

SURFACE ELEVATION 43.0 ± Feet

DATUM Mean Sea Level

BLOWS/FT.	SAMPLE	DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
				GH	Dark brown silty clayey basaltic gravel, dry to trace moist (older alluvium)

Boring completed at 3.8 feet on 07-31-95
Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ☑ - Standard penetration test sample (split-spoon sampler)
- ☑ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY:

LOG OF BORING

Dames & Moore

FIGURE A-1.11

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING P-1A (Page 1 of 1)

SURFACE ELEVATION 44.0 ± Feet

DATUM Mean Sea Level

BLOWS/FT.	SAMPLE DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
			GC	Dark brown to brown silty clayey gravel with fine to coarse basaltic sand and fine subangular to subrounded basaltic gravel, dry to trace moist (older alluvium)

Boring completed at 3.9 feet on 08-01-95
Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ☑ - Standard penetration test sample (split-spoon sampler)
- ⊠ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY:

LOG OF BORING

Dames & Moore

FIGURE A-1.12

PROJECT Kahumana Housing Project JOB No. 04402-139-011

LOCATION Haianae, Oahu, Hawaii DRAWN BY wmk (08-04-95)

BORING P-2 (Page 1 of 1)

SURFACE ELEVATION 44.0 ± Feet

DATUM Mean Sea Level

BLOWS/FT.	SAMPLE DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
			CH	Dark brown silty clay with basaltic gravel, dry to trace moist (recent alluvium)

Boring completed at 4.2 feet on 07-31-95
Groundwater not encountered

NOTES:
- ■ - Relatively undisturbed sample
- ⊠ - Disturbed sample
- □ - Sample lost during extraction
- ☑ - Standard penetration test sample (split-spoon sampler)
- ☑ - Standard penetration test sample no recovery
- I - Core run

DRIVING ENERGY:

LOG OF BORING

Dames & Moore

FIGURE A-1.13

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL SAND SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL SAND CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, MUCK, AND OTHER HIGHLY ORGANIC SOILS

FOR LABORATORY CLASSIFICATION OF FINE-GRAINED SOILS

NOTES:

1. DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE CLASSIFICATIONS.
2. WHEN SHOWN ON THE BORING LOGS, THE FOLLOWING TERMS ARE USED TO DESCRIBE THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE COMPACTNESS OF COHESIONLESS SOILS.

COHESIVE SOILS	(APPROXIMATE UNCONFINED STRENGTH - TSF (kg/cm²))	COHESIONLESS SOILS	
VERY SOFT	LESS THAN .25	VERY LOOSE	THESE ARE USUALLY BASED ON AN EXAMINATION OF SOIL SAMPLES, PENETRATION RESISTANCE, AND SOIL DENSITY DATA.
SOFT	0.25 TO 0.5	LOOSE	
MEDIUM STIFF	0.5 TO 1.0	MEDIUM DENSE	
STIFF	1.0 TO 2.0	DENSE	
VERY STIFF	2.0 TO 4.0	VERY DENSE	
HARD	GREATER THAN 4.0		

GRADATION CHART

MATERIAL SIZE		PARTICLE SIZE			
		LOWER LIMIT		UPPER LIMIT	
		MILLIMETERS	INCH SIZE	MILLIMETERS	INCH SIZE
SAND	FINE	.074	.0029	.42	.0170
	MEDIUM	.42	.0165	2.00	.079
	COARSE	2.00	.0787	4.76	.187
GRAVEL	FINE	4.76	.187	19.1	3/4 "
	COARSE	19.1	3/4 "	76.2	3 "
COBBLES		76.2	3 "	304.8	12 "
BOULDERS		304.8	12 "	914.4	36 "

* U.S. STANDARD * CLEAR SQUARE OPENINGS

PLASTICITY CHART

LIQUID LIMIT

0 10 20 30 40 50 60 70 80 90 100

PLASTICITY INDEX

60 50 40 30 20 10 0

A LINE

B LINE

CH

CL

MH & OH

CL-ML

ML & OL

SAMPLES

- ■ INDICATES UNDISTURBED SAMPLE
- ▣ INDICATES DISTURBED SAMPLE
- ○ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- | INDICATES LENGTH OF DRIVING RUN

NOTE:
DEFINITIONS OF ANY ADDITIONAL DATA REGARDING SAMPLES ARE GIVEN ON THE FIRST LOG ON WHICH THE DATA APPEARS

UNIFIED SOIL CLASSIFICATION SYSTEM

Dames & Moo
FIGURE A-2

SITE EVALUATION/PERCOLATION TEST FOR P-1A

Date/Time: 06/01/95 / 1000 am

Test performed by: WMK

Owner: CA CHON

Tax Map Key: _____

Elevation: 44.0 ft

Depth to Groundwater Table: — ft below grade

Depth to Bedrock (If observed): — ft below grade

Diameter of Hole: 4 in

Depth to Hole Bottom: 3'-11" below grade
ADDED 1½" OF GRAVEL ∴ HOLE BOT. @ -3'-9½"

Depth, below grade	Soil Profile (color, texture, other)
0 - 3'-11"	DK. BRN TO BRN SILTY CLAYEY FINE TO COARSE BASALTIC SANDY FINE SUBANGULAR TO SUBROUNDED BASALTIC GRAVEL, DRY TO TRACE MOIST

PERCOLATION READINGS

Time 12 in of water to seep away: >10 min (first trial reading)

Time 12 in of water to seep away: >10 min (second trial reading)

For percolation tests in sandy soils, record time intervals and water drops at least every 10 minutes for at least 1 hour.

For percolation tests in non-sandy soils, presoak the test hole for at least 4 hours. Record time intervals and water drops at least every 10 minutes for 1 hour; or if the time for the first 6 inches to seep away is greater than 30 minutes, record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops do not vary by more than 1/16 inch.

6/2/95

Time	Interval (MIN)	Drop in Inches
0851	START	—
0901	10	2.76
0911	10	1.44
0921	10	1.80
0922	ADD WATER	—
0942	20	3.60
0952	10	1.32
0957	5	1.08

Time	Interval (MIN)	Drop in Inches
0958	ADD WATER	—
1028	30	4.44
1036	10	1.56
1039	ADD WATER	—
1109	30	4.32
1121	12	1.68
1122	ADD WATER	—
1152	30	4.32

TIME	INTERVAL (MIN)	FELT INCH
1204	12	1.6
1205	ADD WATER	—
1235	30	4.
1247	12	1.
1248	ADD WATER	—
1318	30	4.
1331	13	1.
	STOP	

Percolation Rate (time/final water level drop): 7.7 min/in

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable.

P.E.

Engineer's Signature/Stamp

FIGURE A-3

SITE EVALUATION/PERCOLATION TEST FOR P-2

Date/Time: 08/01/05 / 0720 am

Test performed by: WMK

Owner: CAL HAN

Tax Map Key: _____

Elevation: 44.0 ft
Depth to Groundwater Table: — ft below grade
Depth to Bedrock (If observed): — ft below grade
Diameter of Hole: 4 in
Depth to Hole Bottom: 4'-2" below grade
ADD 1" OF GRAVEL ∴ HOLE BOT @ - 4'-1"

Depth, below grade	Soil Profile (color, texture, other)
0 - 4'-2"	DK BRN SILTY CLAY W/BASALTIC GRAVEL, DRY TO TRACE MOIS

PERCOLATION READINGS

Time 12 In of water to seep away: >10 min (first trial reading)
Time 12 In of water to seep away: >10 min (second trial reading)

For percolation tests in sandy soils, record time intervals and water drops at least every 10 minutes for at least 1 hour.

For percolation tests in non-sandy soils, presoak the test hole for at least 4 hours. Record time intervals and water drops at least every 10 minutes for 1 hour; or if the time for the first 6 inches to seep away is greater than 30 minutes, record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops do not vary by more than 1/16 inch.

2195

Time	Interval (MIN)	Drop in Inches	Time	Interval (MIN)	Drop in Inches
0815	START	—	1115	30	0.24
0825	10	0	1145	30	0.36
0835	10	0	1215	30	0.36
0845	10	0		STOP	
0926	41	0.48			
0945	19	0.24			
1015	30	0.48			
1045	30	0.24			

Percolation Rate (time/final water level drop): 93.3 min/in

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable.

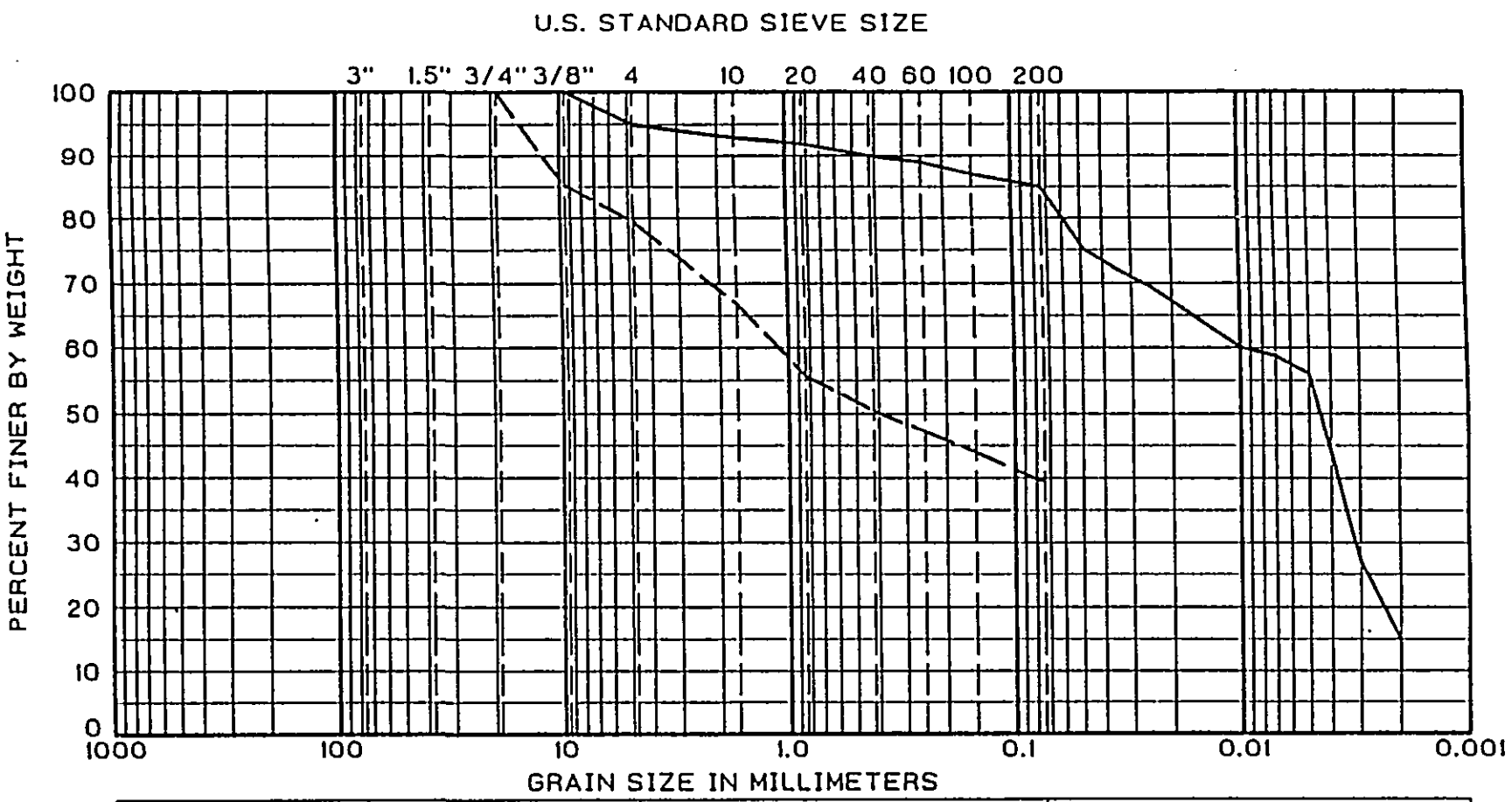
P.E.

Engineer's Signature/Stamp

FIGURE A-4

PROJECT Kahumana Housing Project JOB NUMBER 04402-139-011

LOCATION Waianae, Oahu, Hawaii DRAWN BY JSD DATE DRAWN 09-26-95



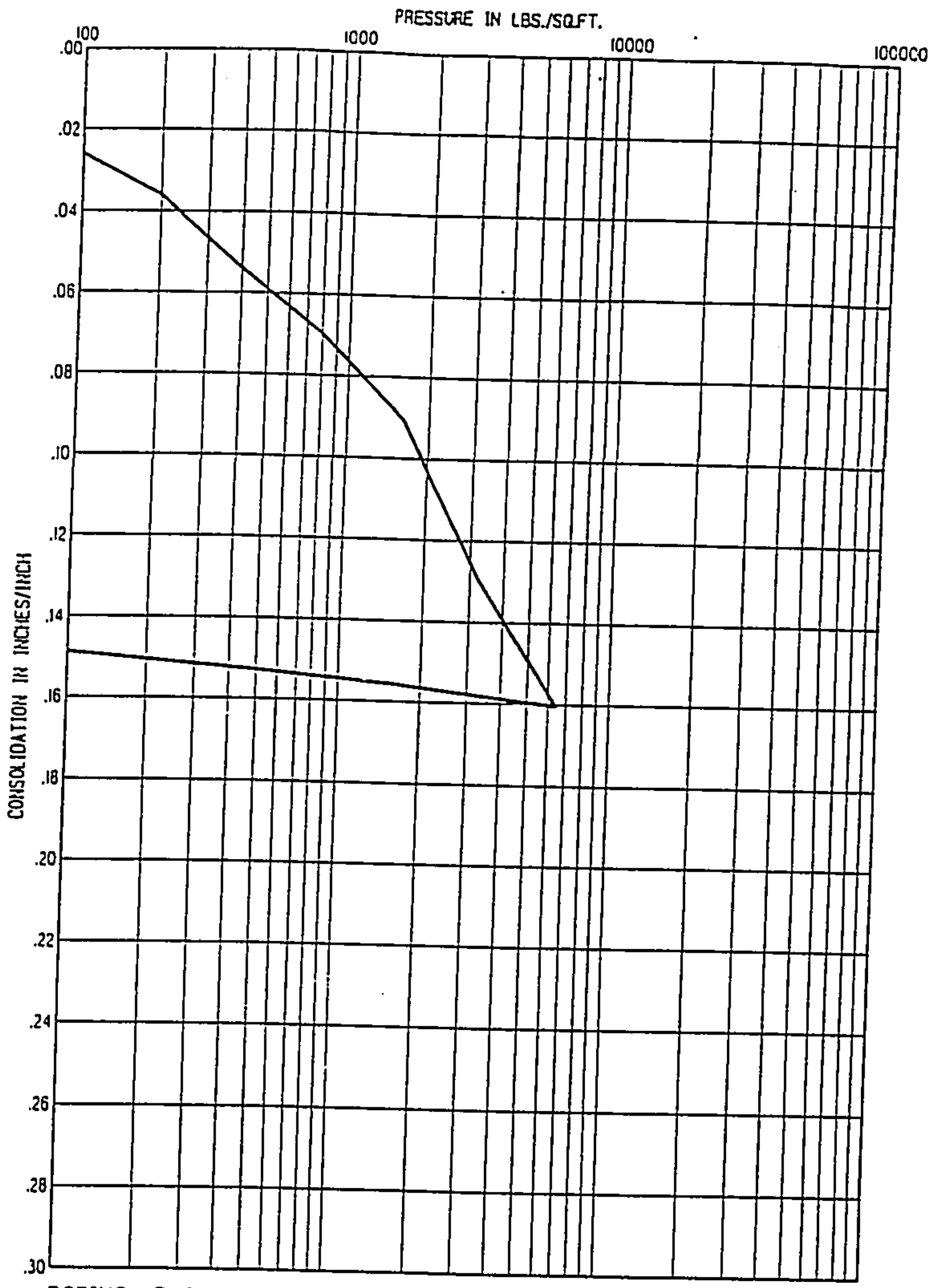
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BORING	DEPTH	CLASSIFICATION		NAT. WC
1	2.5 feet	CL	Dark brown silty clay	25.4
5	2.0 feet	SM	Olive brown silty sand	7.1

Dames & Moore

FIGURE A-5

GRADATION CURVE



BORING *B-6*

SAMPLE DEPTH *5.5 feet*

SOIL DESCRIPTION *Brown silty clayey sand, loose (SM)*

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT (%)	19.8	36.3
DRY DENSITY (pcf)	104.0	84.4

CONSOLIDATION TEST DATA

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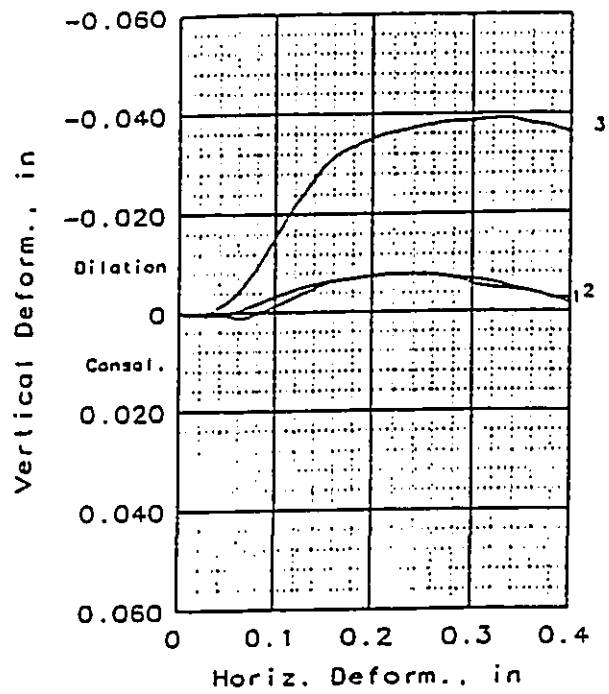
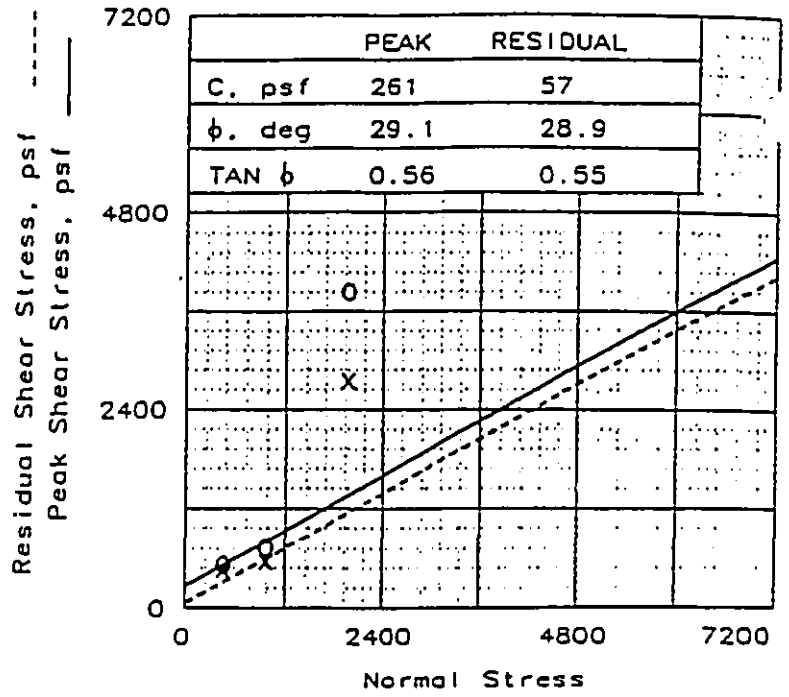
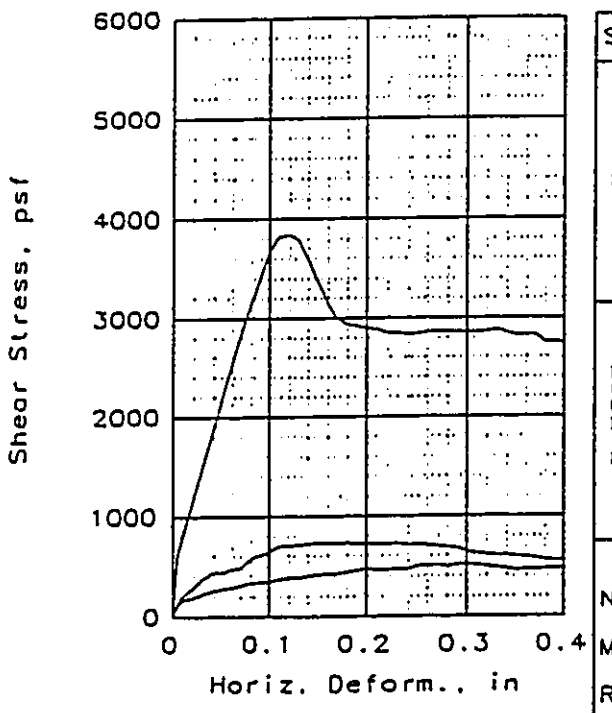
FIGURE A-6

PROJECT [illegible] Housing Project JOB NUMB. 31402-139-011 DATE 03-26-95 DRAWN BY [illegible]





	PEAK	RESIDUAL
C, psf	261	57
ϕ, deg	29.1	28.9
TAN ϕ	0.56	0.55



SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	21.2	21.4	20.6
	DRY DENSITY, pcf	77.6	86.7	91.5
	SATURATION, %	49.5	62.5	67.5
	VOID RATIO	1.133	0.908	0.809
	DIAMETER, in	2.42	2.42	2.42
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	41.5	34.5	34.8
	DRY DENSITY, pcf	79.6	88.5	94.0
	SATURATION, %	101.9	105.2	121.5
	VOID RATIO	1.078	0.869	0.760
	DIAMETER, in	2.42	2.42	2.42
	HEIGHT, in	0.97	0.98	0.97
NORMAL STRESS, psf		500	1000	2000
MAXIMUM SHEAR, psf		521	734	3838
RESIDUAL SHEAR, psf		463	555	2743
Strain rate, in/min		0.002	0.002	0.002

SAMPLE DATA

SAMPLE TYPE: Undisturbed

DESCRIPTION: Drk. brn. silty to clayey sand

LL= PL= PI=

SPECIFIC GRAVITY= 2.65

REMARKS: Sample is very loose and crumbled easily

FIG. NO. 1

CLIENT: City & County of Honolulu

PROJECT: Kahumana Housing Project
Lualualei, Waianae, Oahu, Hawaii

SAMPLE LOCATION: Boring 6 Sample 2 @ 5.5'

PROJ. NO.: 04402-139 DATE: Sept. 14, 1995

DIRECT SHEAR TEST REPORT

DAMES AND MOORE

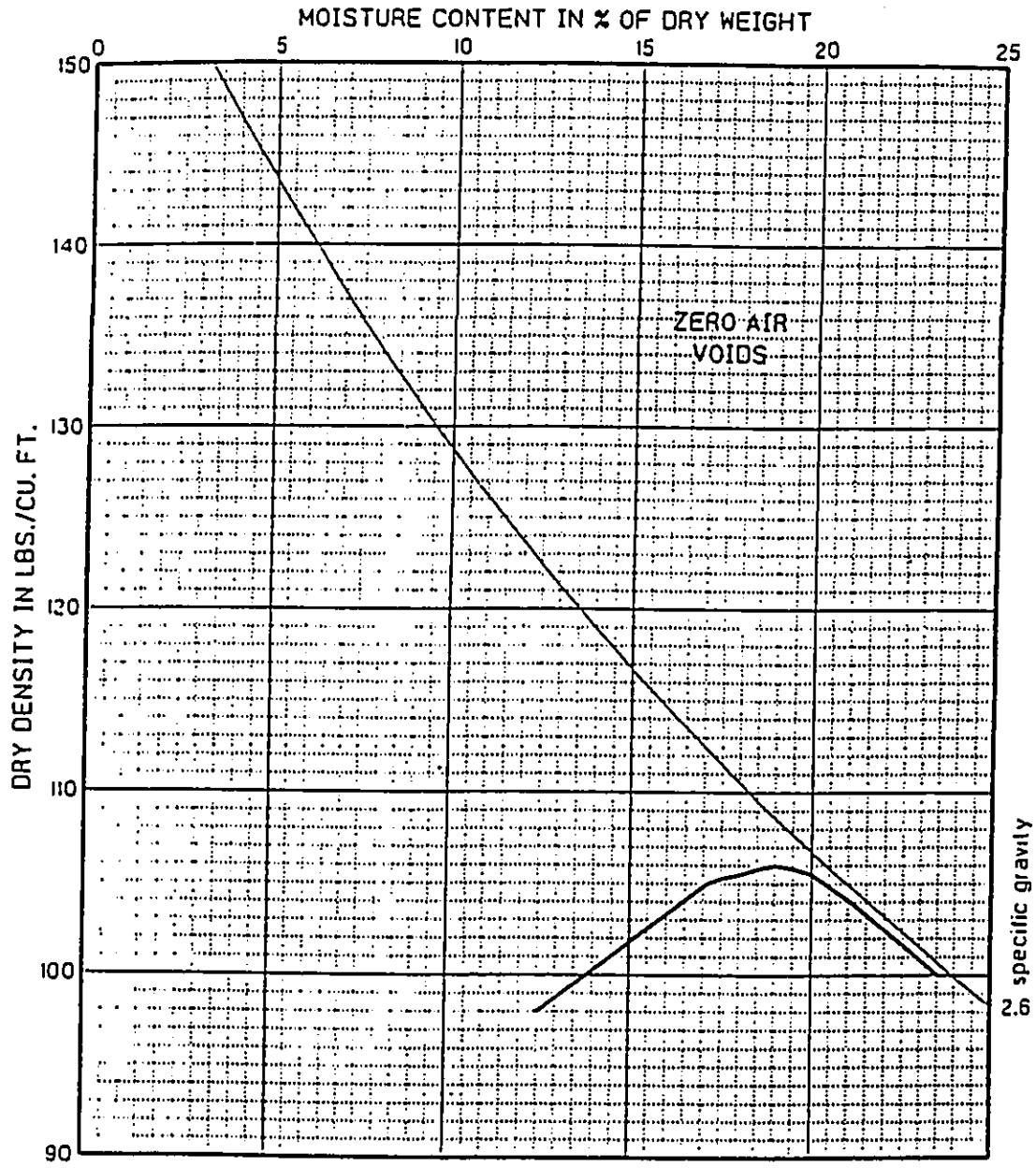
FIGURE A-7

SAMPLE DEPTH .5-1.0 Ft.
ELEVATION Ft. (MSL Datum)
SOIL Dark brown silty clay
COMPACTION METHOD ASTM D-1557-91-A
OPTIMUM MOISTURE CONTENT 19.0 %
MAXIMUM DRY DENSITY 106.0 pcf

JOB NUMBER: 04402-139-011
PROJECT: Kahumana Housing Project
Waianae, Oahu, Hawaii
DRAWN BY: jsb (10-23-95)

BORING B-3

SAMPLE LOCATION: Lualualei



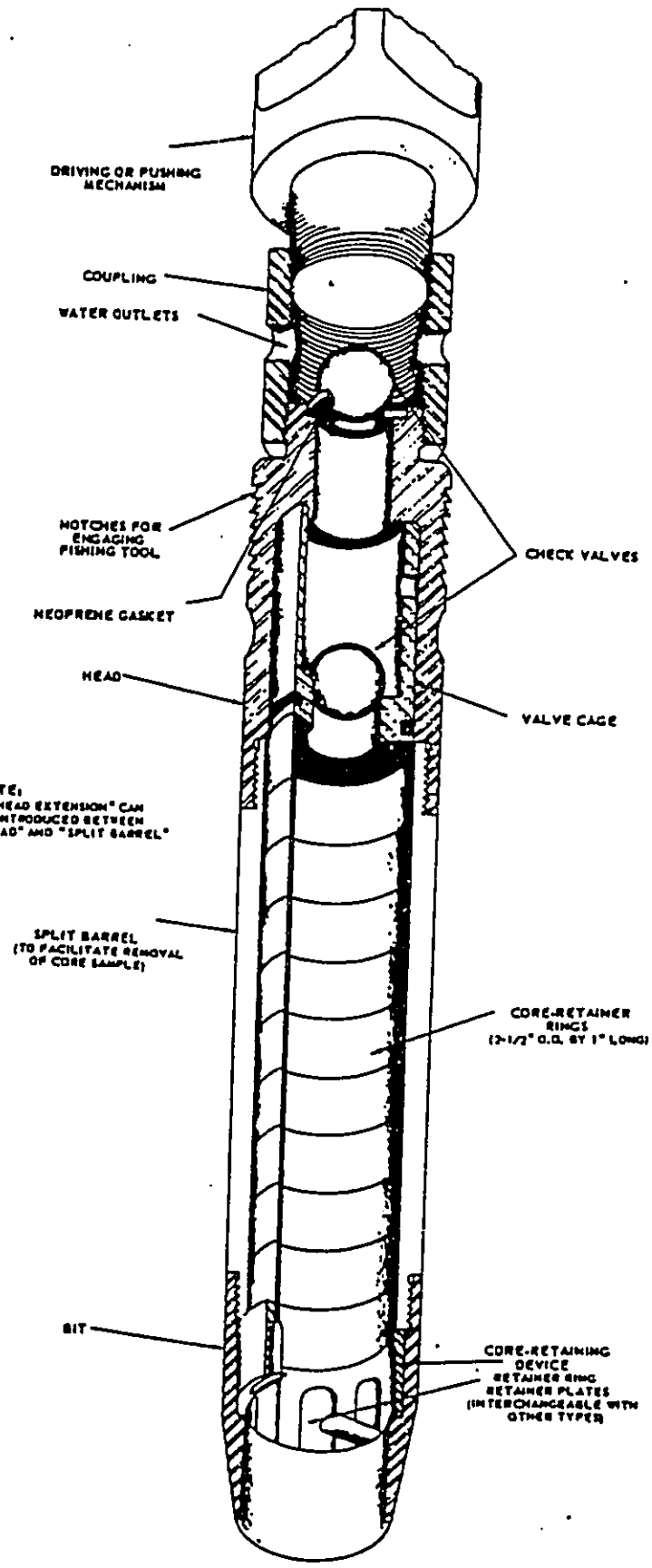
COMPACTION TEST DATA

Dames & Moore

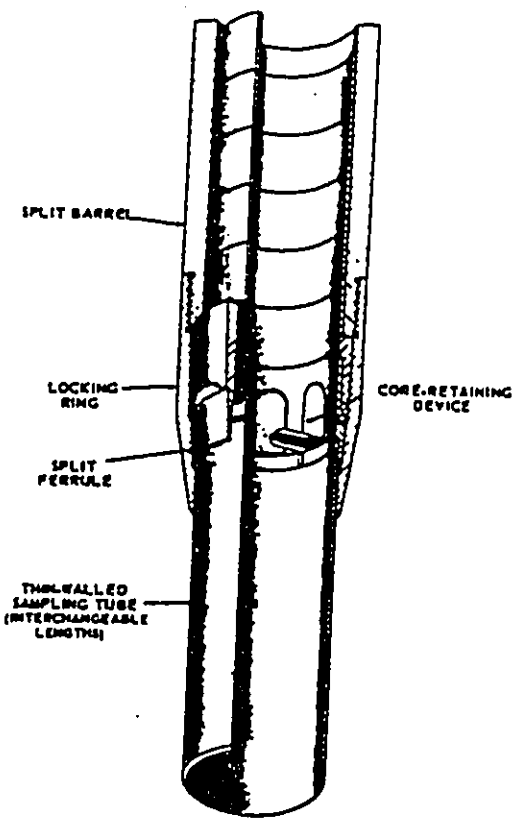
FIGURE A-8

SOIL SAMPLER TYPE U

FOR SOILS DIFFICULT TO RETAIN IN SAMPLER



ALTERNATE ATTACHMENTS



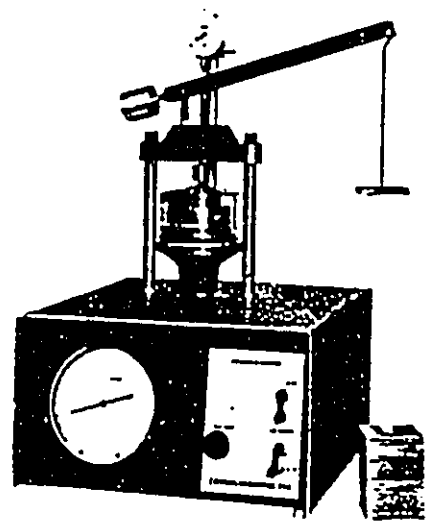
417.9 (5-68)

DAMES & MOORE
EXHIBIT A-1

Method Of Performing Consolidation Tests

Consolidation tests are performed to evaluate the volume changes of soils subjected to increased loads. Time-consolidation and pressure-consolidation curves may be plotted from the data obtained in the tests. Engineering analyses based on these curves permit estimates to be made of the probable magnitude and rate of settlement of the tested soils under applied loads.

Each sample is tested within brass rings two and one-half inches in diameter and one inch in length. Undisturbed samples of in-place soils are tested in rings taken from the sampling device in which the samples were obtained. Loose samples of soils to be used in constructing earth fills are compacted in rings to predetermined conditions and tested.



DEAD LOAD-PNEUMATIC CONSOLIDOMETER

In testing, the sample is rigidly confined laterally by the brass ring. Axial loads are transmitted to the ends of the sample by porous disks. The disks allow drainage of the loaded sample. The axial compression or expansion of the sample is measured by a micrometer dial indicator at appropriate time intervals after each load increment is applied. Each load is ordinarily twice the preceding load. The increments are selected to obtain consolidation data representing the field loading conditions for which the test is being performed. Each load increment is allowed to act over an interval of time dependent on the type and extent of the soil in the field.

Method Of Performing Direct Shear and Friction Tests

Direct shear tests are performed to determine the shearing strengths of soils. Friction tests are performed to determine the frictional resistances between soils and various other materials such as wood, steel, or concrete. The tests are performed in the laboratory to simulate anticipated field conditions.

DIRECT SHEAR APPARATUS WITH ELECTRONIC RECORDER

Each sample is tested in a split sample holder, two and one-half inches in diameter and one inch high. Undisturbed samples of in-place soils are extruded from rings taken from the sampling device in which the samples were obtained. Loose samples of soils to be used in constructing earth fills are compacted in rings to predetermined conditions and tested.

Direct Shear Tests

A one-inch length of the sample is tested in direct single shear. A constant pressure, appropriate to the conditions of the problem for which the test is being performed, is applied normal to the ends of the sample through porous stones. A shearing failure of the sample is caused by moving the upper sample holder in a direction perpendicular to the axis of the sample. Transverse movement of the lower sample holder is prevented.

The shearing failure is accomplished by applying to the upper sample holder a constant rate of deflection. The shearing load and the deflections in both the axial and transverse directions are recorded and plotted. The shearing strength of the soils is determined from the resulting load-deflection curves.

Friction Tests

In order to determine the frictional resistance between soil and the surfaces of various materials, the lower sample holder in the direct shear test is replaced by a disk of the material to be tested. The test is then performed in the same manner as the direct shear test by forcing the soil over the friction material surface.

Dames & Moore
EXHIBIT A-3

Water Course Determination

Appendix C

9413

RECEIVED
'29 [illegible]
Urban Works

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

MAR 28 1995

MICHAEL D. WILSON
CHAIRPERSON

ROBERT S. NAKATA
ROBERT Q. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIKE

RAE M. LOUI, P.E.
DEPUTY

Mr. Lorrin Matsunaga, AIA
Principal
Urban Works, Inc.
831 Pohukaina Street, Suite E1
Honolulu, Hawaii 96813

Dear Mr. Matsunaga:

This is in response to your letter dated February 22, 1995, requesting our opinion as to whether a watercourse running through the property you mention is considered to be a stream as defined in Section 13-169-2, Hawaii Administrative Rules (HAR).

Based on a field visit by our staff on March 17, 1995, we believe that the watercourse does not support any instream uses. Therefore, it is not considered to be a "stream" as defined in Section 13-169-2, HAR, and not subject to a stream channel alteration permit, pursuant to Section 13-169-50, HAR.

We appreciate your inquiry and concern for the Commission's permit requirements. Should you have any questions, please call David Higa at 587-0249.

Sincerely,

RAE M. LOUI
Deputy Director

RJ:ss

Farmland Conversion
Impact Rating Form

Appendix D

* U S GOVERNMENT PRINTING OFFICE: 1984-451-159/1324

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*		
Name Of Project: Kahumana Housing Project Phase II	Date Of Land Evaluation Request: February 8, 1996	
Proposed Land Use: Residential/Agricultural	Federal Agency Involved: Housing and Urban Development	
	County And State: Honolulu, Hawaii	
PART II *(To be completed by SCS)*	Date Request Received By SCS: 2/15/96	
Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply – do not complete additional parts of this form)*	Yes ☒ No ☐	Acres Irrigated: 36,300 / Average Farm Size: 1-39
Major Crop(s): Pineapple, bananas, truckcrops	Farmable Land In Govt. Jurisdiction: Acres: 151,360 % 39	Amount Of Farmland As Defined in FPPA: Acres: 94,500 % 24
Name Of Land Evaluation System Used: State of HI LESA	Name Of Local Site Assessment System: None	Date Land Evaluation Returned By SCS: 3/28/96

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	~~0.13~~ 4.6			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	~~12.36~~ 41			
PART IV *(To be completed by SCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	26			
B. Total Acres Statewide And Local Important Farmland	24.1			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.0004			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	0.025			
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	94			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use		15			
2. Perimeter In Nonurban Use		10			
3. Percent Of Site Being Farmed		0			
4. Protection Provided By State And Local Government		20			
5. Distance From Urban Builtup Area		10			
6. Distance To Urban Support Services		10			
7. Size Of Present Farm Unit Compared To Average		0			
8. Creation Of Nonfarmable Farmland		0			
9. Availability Of Farm Support Services		5			
10. On-Farm Investments		5			
11. Effects Of Conversion On Farm Support Services		0			
12. Compatibility With Existing Agricultural Use		5			
TOTAL SITE ASSESSMENT POINTS	160	80			
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	71			
Total Site Assessment *(From Part VI above or a local site assessment)*	160	80			
TOTAL POINTS *(Total of above 2 lines)*	260	151			

Selected: A	Date Of Selection: April 10, 1996	Was A Local Site Assessment Used? Yes ☐ No ☒

Reason For Selection:

See attached

KAHUMANA TRANSITIONAL HOUSING PROJECT
Farmland Protection Policy Act Compliance
Determination and Final Site Selection
April 9, 1996

The Site's combined and relative value and site assessment points total 151 indicating that the site is not suitable for some degree of protection under the Farmland Protection Policy Act.

The Department of Housing and Community Development (DHCD) determines that the development of the proposed Kahumana Phase II affordable rental housing project on a 12.38 acre site located at 86-433 Kuwale Road, Waianae, identified as Site A of USDA form AD-1006, is consistent with the purposes of the Act and will proceed with the development of the proposed project. The reasons supporting this determination are as follows:

1. No suitable alternative site is available. The present site is currently owned by the City and County of Honolulu and leased to Alternative Structures International (ASI) who will develop and operate the Kahumana Phase II project. The project site is also conveniently located adjacent to the existing Kahumana Community Center and Ohana Ola O' Kahumana (Kahumana Phase I) which are operated by ASI. Many of ASI's staff work and reside on the Kahumana Community Center site and some of the program services provided there will be made available to the residents of Kahumana Phase II. The project will also provide the opportunity for permanent housing for the families completing the transitional housing program at Ohana Ola O' Kahumana.

2. The project will be compatible with the surrounding agricultural uses and designed to complement the surrounding architecture. The project buildings will be setback from the property line to allow a natural landscape buffer between the project site and the neighboring parcels. The two story wooden buildings will be spread out on the site with landscape and open spaces between them.

   Kahumana Phase II, like the adjacent Kahumana Community will have agricultural activities integrated into its social programs. Project residents, other ASI clients, and members of the community are given the opportunity to learn farming and cultivation skills on the site.

3. An environmental assessment will be submitted to the Office of Environmental Quality Control and published in the Environmental Bulletin.

a) State and local land use controls (zoning, development plan) limit the permitted uses of the parcel and are intended to promote continued agricultural use. 20 20

5. Distance From Urban Built-up Area

How close is the site to an urban built-up area?

The site is 2 miles or more from an urban built-up area - 15 pts.
The site is more than 1 mile but less than 2 miles from an urban built-up area - 10 pts.
The site is less than 1 mile from, but is not adjacent to an urban built-up area - 5 pts.
The site is adjacent to an urban built-up area - 0 pts.

a) The site is within 2 miles of the communities of the communities of Maili and Waianae. 15 10

6. Distance To Urban support Services

How close is the site to water lines, sewer lines and/or other local facilities and services whose capacities and design would promote nonagricultural use?

None of the services exist nearer than 3 miles from the site - 15 pts.
Some of the services exist more than 1 but less than 3 miles from the site - 10 pts.
All of the services exist within 1/2 mile of the site - 0 pts.

a) Water service, telephone and electrical utilities is currently available to the parcel and the nearest sewer line is approximately one mile from the site. 15 10

7. Size Of Present Farm Unit Compared To Average

Is the farm unit(s) containing the average-size farming unit in the county? (Average farm sizes in each county are available from the SCS field offices in each state. Data are from the latest available Census of Agriculture. Acreage of Farm Units in Operation with $1,000 or more in sales.)

As large or larger - 10 pts.
Below average-deduct 1 pt. for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 pts.

a) The average farm size is 139 acres. The parcel

a)	On-site farm investments is limited to an earthen dry gulch. The project site has no farm related buildings and has not been maintained for farm use. A 14-unit transitional housing project is located on the eastern end of the 12.38 acre parcel with the project site situated on the vacant western end of the parcel.	20	05

11. Effects Of Conversion On Farm Support Services

Would the project at this site by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of the support services and thus, the visibility of the farms remaining in the area?

Substantial reduction in demand for support services if the site is converted - 10 pts.
Some reduction if demand for support services if the site is converted - 9 to 1 pts.
No significant reduction in demand for support services if the site is converted - 0 pts.

a)	The land to be converted is minimal in relation to the amount of agricultural land in the area and the proposed conversion is not expected to significantly reduce the demand for support services.	10	0

12. Compatibility With Existing Agricultural Use

Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that is likely to contribute to the eventual conversion of surrounding farmland to non-agricultural use?

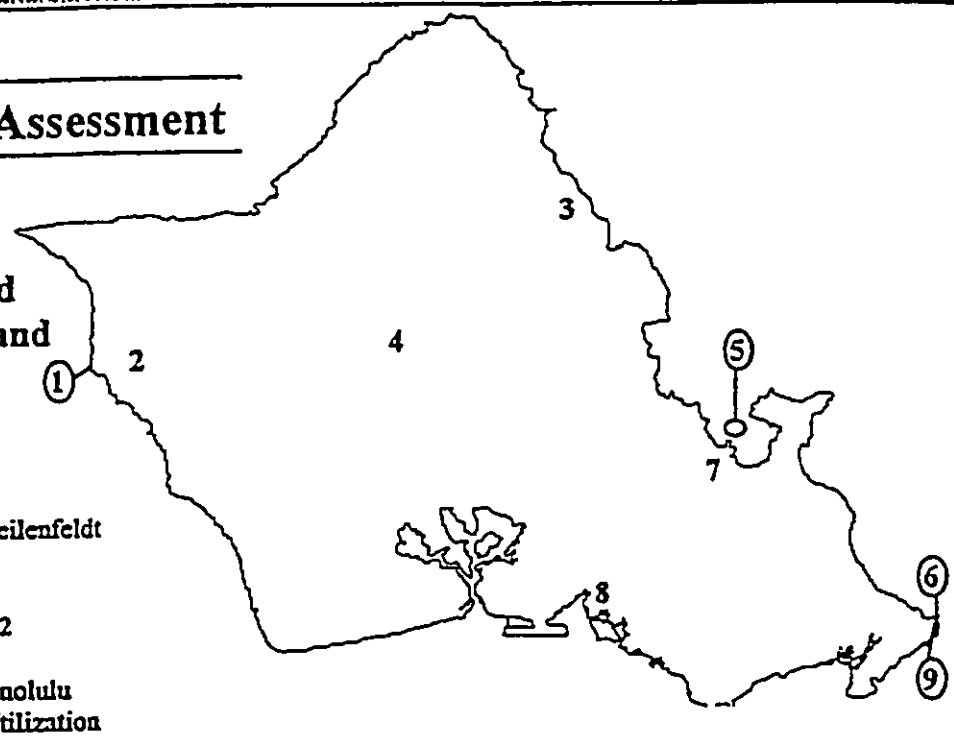
Proposed project is incompatible with existing agricultural use of surrounding farmland - 10 pts.
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 pt(s).
Proposed project is fully compatible with existing agricultural of surrounding farmland - 0 pts.

a)	Approximately 50 percent of the project site will remain as landscape/open space with the incorporation of community gardens. The proposed project will integrate agricultural activities as part of its social program and is expected to be compatible with the surrounding agricultural uses.	10	05
TOTAL SITE ASSESSMENT POINTS		160	80

Draft Environmental Assessment Notice
and Comment Letter Received

M/O FILE

Draft Environmental Assessment



(1) Geilenfeldt Retaining and Shore Protection Structure and Fill

District: Waianae
TMK: 8-4-10:11
Applicant: Richard and Sharon Geilenfeldt
(696-6038)
84-091 Makau Street
Waianae, Hawaii 96792

Accepting Authority: City and County of Honolulu
Department of Land Utilization
650 South King Street, 7th Floor
Honolulu, Hawaii 96813
Contact: Ardis Shaw-Kim (527-5349)

Consultant: Sea Engineering, Inc.
Makai Research Pier, Suite 8
Waimanalo, Hawaii 96795
Contact: Scott Sullivan (259-7966)

Public Comment Deadline: May 23, 1996
Status: DEA First Notice, pending public comment. Address comments to the applicant with copies to the accepting authority, the consultant and OEQC.

The 12,963 square foot lot is located on the western shore of Oahu in a residential community between Makaha Beach Park and Kepuhi Point. The address of the property is 84-135 Makau Street, Waianae. The lot is currently vacant. The shoreline in the vicinity is rocky, consisting of coral terraces formed during ancient high sea level stands.

The applicant proposes to construct a concrete rubble masonry wall immediately landward of the certified shoreline with a return side yard wall along the north property boundary. The wall will be as high as 8 feet. As such, a Land Use Ordinance height variance will be required. Cross-sections indicate that at its widest, the base of the wall will be approximately 10 feet. The proposal requires a shoreline setback variance and a height variance.

(2) Kahumana Affordable Rental Housing Project, Phase II

District: Waianae
TMK: 8-6-6:01
Applicant: City and County of Honolulu
Department of Housing and Community Development
650 South King Street, 5th Floor
Honolulu, Hawaii 96813
Contact: Lorna Uesato (523-4162)

Accepting Authority: City and County of Honolulu
Department of Housing and Community Development
650 South King Street, 5th Floor
Honolulu, Hawaii 96813
Contact: Lorna Uesato (523-4162)

Public Comment Deadline: May 23, 1996
Status: DEA First Notice, pending public comment. Address comments to the applicant with copies to OEQC.

The City and County of Honolulu and Alternative Structures International (ASI) are undertaking the planning and design of Kahumana Phase II, a 34-unit rental develop-

ment in Lualualei Valley, Waianae, Hawaii. The project is intended to provide permanent rental housing to lower-income families and the elderly. The plans provide for a community center, on-site parking, community gardens, agricultural and open space. The planning and design activities are being undertakine by ASI with HOME funds provided by the City. ASI and the City will seek exemptions from planning, zoning and land development standards pursuant to Section 201E-210, Hawaii Revised Statutes.

(3) Kaluanui Booster Station

District: Koolauloa
TMK: 5-3-10
Applicant: City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843
Contact: Barry Usagawa (527-5235)
Accepting Authority: City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843
Contact: Raymond Sato (527-6180)
Consultant: Engineering Design Group, Inc.
1525 Young Street
Honolulu, Hawaii 96814
Contact: Edgar Lee (942-4400)
Public Comment Deadline: May 8, 1996
Status: DEA Second Notice, pending public comment. Address comments to the applicant with copies to the consultant and OEQC.

This project would construct a booster pumping station to improve Board of Water Supply service in transmitting water from existing sources through an existing transmission pipeline in Windward Oahu. The purpose of the project is to construct a booster station to move water from the Hauula 180' system to the Kahana 315' reservoir. The proposed new booster station would consist of a one-story building to be constructed of concrete blocks to enclose the pumping equipment. The building would be about 40 feet on each side for a total area of 1,600 square feet. Equipment inside the building would consist of electric motors, pumps, controls, valves and pipes. The building would be located within a fenced area of about 0.5 acres. The site is at the entrance to Sacred Falls State Park, and would be accessed via a driveway from Kamehameha Highway.

(4) Wahiawa Satellite City Hall Relocation

District: Wahiawa
TMK: 7-4-07:por. 6
Applicant: City and County of Honolulu, Building Department
650 South King Street
Honolulu, Hawaii 96813
Contact: Clifford Lau (527-6373)
Accepting Authority: City and County of Honolulu, Building Department
650 South King Street
Honolulu, Hawaii 96813
Contact: Clifford Lau (527-6373)
Consultant: Gerald Park Urban Planner (942-7484)
1400 Rycroft Street, Suite 876
Honolulu, Hawaii 96814
Public Comment Deadline: May 8, 1996
Status: DEA Second Notice, pending public comment. Address comments to the applicant with copies to the consultant and OEQC.

The Building Department, City and County of Honolulu, proposes to construct a new satellite city hall in the town of Wahiawa, Oahu, Hawaii. Applicant proposes to build a new structure adjacent to the Wahiawa Police Station located at 330 North Cane Street and relocate the existing satellite city hall from California Avenue to the subject site.

A single-story structure with a building footprint of approximately 1,960 square feet is proposed. Interior space will accommodate the range of city services provided at Wahiawa Satellite City Hall which includes in part vehicle registration (motor and bicycle), bill payment (water and real property tax), issuing camping permits, and selling bus passes.

The construction cost of the project is estimated at $660,000 and will be funded by the City and County of Honolulu through Community Development Block Grant (CDBG) monies. A nine month building period is scheduled with construction commencing in early 1997.

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE [808] 586-4185
FACSIMILE [808] 586-4186

April 23, 1996

Roland Libby, Jr.
Department of Housing and Community Development
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

Attention: Lorna Uesato

Dear Mr. Libby:

Subject: Draft Environmental Assessment (EA) for Kahumana Phase II, Lualualei; TMK 8-6-6: 01

In the final EA please include the following:

1. A discussion of any planned future phases of this project. HRS Chapter 343 prohibits segmented analyses of a larger project, but requires an analysis, and possibly preparation on an environmental impact statement, for a project in its entirety.

2. Diagrams or drawings showing the conceptual design of the buildings. Of concern are the size, bulk and density of the buildings. Also their height and color should be described as part of an analysis of how the development will blend in with the natural, rural setting.

3. The time frame (and phasing, if applicable) for project implementation.

4. The letter from the Commission on Water Resources Management in Appendix C (Water Course Determination) does not reference a TMK, neighborhood or area name, and is addressed to Lorrin Matsunaga, who is not mentioned elsewhere in

the document. Please include some documentation showing that this response applies to the dry gulch that bisects the project's parcel.

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

Sincerely,

GARY GILL
Director

DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU

STANDARD FINANCE BUILDING
715 SOUTH KING STREET
HONOLULU, HAWAII 96813
527-5311 • 527-5498 (FAX)

JEREMY HARRIS
MAYOR

ABELINA MADRID SHAW
DIRECTOR

MANNY VALBUENA
DEPUTY DIRECTOR

January 19, 1999

Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Sir or Madam:

Subject: Environmental Assessment
Kahumana Phase II

This is in response to your letter dated April 23, 1996 regarding the subject environmental assessment. Our responses to your comments are as follows:

1. *A discussion of any planned future phases of this project. Chapter 343 prohibits segmentated analysis of a larger project, but requires an analysis, and possibly preparation of an environmental impact statement, for a project in its entirety.*

   The City and the project developer/operator, Alternative Structures International, plan no future development of the project site beyond the proposed project. A statement to this effect will be contained on Page 3 of the final Environmental Assessment/Negative Declaration.

2. *Diagrams or drawings showing the conceptual design of the buildings. Of concern are the size, bulk, and density of the buildings. Also their height and color should be described as part of an analysis of how the development will blend in with the natural, rural setting.*

   A more fully rendered site plan, building elevations and perspective sketch will be included in Appendix A of the final Environmental Assessment/Negative Declaration. The drawings and supporting discussion will document that the proposed project will be designed and developed in a manner which minimizes visual impacts to the surrounding community.

3. *The time frame (and phasing, if applicable) for project implementation.*

   The time frame will be discussed on page 3 of the final Environmental Assessment/Negative

Declaration. Construction is anticipated to begin in late summer 1999, with completion to occur in 12 to 14 months.

4. *The letter from the Commission on Water Resources Management in Appendix C (Water Course Determination) does not reference a TMK, neighborhood or area name, and is addressed to Lorrin Matsunaga, who is not mentioned elsewhere in the document. Please include some documentation that this response applies to the dry gulch that bisects the project's parcel.*

Mr. Matsunaga is a principal with the architectural firm of Urban Works, Inc. who was under contract to ASI to provide planning and design services for the Kahumana Phase II project. Unfortunately, the City cannot dictate to the Commission of Water Resources the form of correspondence it chooses to release in response to public inquiries. The request for the water course determination was requested by the City and ASI and the City can confirm that the Commission's letter was in fact mailed to Mr. Matsunaga in response to his inquiry regarding the dry gulch which bisects the Kahumana Phase II project site.

A fourth copy of the final Environmental Assessment/Negative Declaration is transmitted herein, along with three copies of this letter for inclusion in the three copies previously transmitted. Questions regarding this matter may be directed to Keith Ishida at 527-5092.

Sincerely,

ABELINA MADRID SHAW

ABELINA MADRID SHAW
Director

Enclosures