



DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
COUNTY OF MAUI

LINDA CROCKETT LINGLE
Mayor

STEPHANIE AVEIRO
Director

HENRY OLIVA
Deputy Director

RECEIVED

200 SOUTH HIGH STREET, WAILUKU, HAWAII 96793

September 7, 1995

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(808) 243-7805

OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Waiale Road Affordable Rental Project
TMK (2) 3-8-46:21, Wailuku, Maui, Hawaii

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

Notice of the availability of the Draft Environmental Assessment for the project was published in the August 8, 1995 edition of the OEQC Bulletin.

As the approving agency, the County of Maui, Department of Housing and Human Concerns has determined that there will be no significant impacts as a result of the project. Accordingly, we are filing the Final Environmental Assessment as a negative declaration.

Enclosed are one (1) copy of the OEQC Bulletin Publication Form and four (4) copies of the Final Environmental Assessment. We respectfully request that notice of the Final Environmental Assessment be published in the next edition of the OEQC Bulletin.

Very truly yours,

STEPHANIE AVEIRO
Director of Housing and
Human Concerns

ETO:hs

Enclosures

Housing Division

Senior Services Division

Youth Services Division

Immigrant Services

Office on Aging

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Final
Environmental Assessment

Waiale Road
Affordable Rental Project

Prepared for

Maul Economic Concerns
of the Community, Inc.

September 1995



***Final
Environmental Assessment***

***Waiale Road
Affordable Rental Project***

Prepared for

**Maui Economic Concerns
of the Community, Inc.**

September 1995



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Preface

In partnership with the County Department of Housing and Human Concerns, Maui Economic Concerns of the Community, Inc. (MECC), a local non-profit organization also known as Ka Hale A Ke Ola, is proposing to construct an affordable rental housing facility for low-income families and individuals, in Wailuku, Maui, Hawaii. In addition, the County Department of Parks and Recreation is also proposing to undertake the design and preparation of plans, specifications, and estimates for the development of a future park facility. Identified by TMK (2) 3-8-46:21, the 15-acre project site will utilize twelve (12) acres for the development of 200 multi-family units and ancillary facilities, while the remaining three (3) acres will be utilized for the future park development. Development of the affordable rental housing facility will be implemented through Chapter 201E, Hawaii Revised Statutes (HRS).

Pursuant to Chapter 343, HRS, and Chapter 200 of Title 11, Department of Health Administrative Rules, Environmental Impact Statement Rules, and 24 CFR Part 58, U.S. Department of Housing and Urban Development, Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities, this Environmental Assessment documents the project's technical characteristics, environmental impacts and alternatives, and advances findings and conclusions relative to the significance of the project.

Summary

Applicant and Landowner

In partnership with the County Department of Housing and Human Concerns, Maui Economic Concerns of the Community, Inc. (MECC), a local non-profit organization also known as Ka Hale A Ke Ola, and the County Department of Parks and Recreation (DPR) are the applicants for the Waiale Road Affordable Rental project and adjoining park development. The County of Maui is the landowner of the property underlying the project site.

Property Location and Description

Identified by TMK (2) 3-8-46:21, the 15-acre project site is further described as Lot 2-A and will be subsequently subdivided into two (2) lots, Lot 2-A-1 consisting of approximately twelve (12) acres, and Lot 2-A-2 containing three (3) acres.

The project site is bordered by MECC's Homeless Resource Center to the north. In addition to undeveloped lands to the east and south, the project site is also bordered by Waiale Reservoir to the east and the 3.0 million gallon Kahului Reservoir to the south. A cane-haul road and the Wailuku Project District are located to the west of the project site.

Currently, the project site is undeveloped and predominantly vegetated with koa haole, kiawe, buffelgrass, and introduced grass species. Access to the project site is provided by an existing easement along a cane-haul road located immediately south of, and adjacent to Waiale Road.

The project site is designated Urban and Public/Quasi-Public by the State Land Use Commission and Wailuku-Kahului Community Plan, respectively. Currently, the project site is located within the Interim Zoning District as reflected by Maui County zoning.

Proposed Action

In partnership with the County Department of Housing and Human Concerns (DHHC), MECC is proposing to construct an affordable rental housing facility for low-income families and individuals in Wailuku, Maui, Hawaii. In addition, the Department of Parks and Recreation (DPR) is also proposing to undertake the design and preparation of plans, specifications, and estimates for the development of a future park facility.

The proposed project, consisting of two (2) components, will involve the development of an affordable rental housing facility and related improvements on Lot 2-A-1, and the design and preparation of plans, specifications, and estimates for a future park facility on Lot 2-A-2.

Consisting of approximately twelve (12) acres, Lot 2-A-1 is proposed for development as an affordable rental housing facility for long-term, low-income occupancy. The proposed facility will consist of 200 unfurnished apartment units, a community center, a manager's unit and office, as well as laundry, storage, and maintenance buildings. In addition to related parking, drainage, and landscaping improvements, a privately operated sewer pump station is also proposed.

A total of 30 two-story buildings containing 24 studio units, 128 two-bedroom units, 32 three-bedroom units, and 16 four-bedroom units will be constructed for occupancy.

Each studio and two-bedroom unit will consist of 420 sq. ft. and 737 sq. ft. of living area, respectively, while the three and four-bedroom units will contain 1,059 sq. ft. and 1,180 sq. ft., respectively. Each unit will also include lanais ranging in area from 76 sq. ft. to 98 sq. ft. Consisting of approximately 3,400 sq. ft., the proposed community center will include a multi-purpose room, classroom, kitchen, storage room, and two (2) bathrooms. Common area facilities and ten (10) first floor units will be handicapped accessible and equipped.

The proposed facility will provide affordable rental housing for families and individuals earning 50 percent or less than the 1995 Maui County median family income of \$49,300.00. Including electrical, water, and trash collection fees, rents are projected to range from \$425 per month for a studio unit, to \$625 per month for a four-bedroom unit.

County funds from Multi-Family Private Activity General Obligation Bonds for Non-Profits, State rental housing trust funds, Federal HOME funds, as well as private funds and grants, will be utilized for the development of the proposed affordable rental housing facility. Currently, MECC is in the process of negotiating a 55-year lease with the County for the use of Lot 2-A. The long-term lease is anticipated to be executed prior to July 31, 1995.

Consisting of three (3) acres, Lot 2-A-2 will be developed as a future park facility. Community Development Block Grant (CDBG) program funds are proposed for implementing the design and preparation of plans, specifications, and estimates for the future 3-acre park. Consisting of a sports field, passive recreational area, and parking and restroom facilities, the proposed design and development of the future park facility is anticipated to address the recreational needs of local residents and the surrounding community.

Since the proposed project involves County land and funding, as well as State and Federal (e.g., HOME, CDBG) funding, an Environmental Assessment has been prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes (HRS), and Chapter 200 of Title 11, Department of Health Administrative Rules, Environmental Impact Statement Rules, and 24 CFR Part 58, U.S. Department of Housing and Urban Development (HUD), Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities.

It should be noted that development of the rental housing facility will be implemented through Section 201E-210, HRS, as coordinated with the DHHC. Accordingly, exemptions and waivers from regulatory and statutory requirements relating to zoning, assessments, construction, subdivision, public service, and administrative procedures are being requested.

Approximately \$14 million will be utilized for the development of the proposed affordable rental housing facility, as well as the design and preparation of plans, specifications, and estimates for the future 3-acre park. Construction of the proposed affordable rental housing facility is anticipated to commence by the end of 1995. Once site work has been completed, the proposed facility will be developed in three (3) construction phases over an 18-month period.

A preliminary estimate of construction costs related to the future park facility is approximately \$0.5 million. The completion of the park improvements is anticipated to coincide with the conclusion of construction activities for the affordable rental housing facility.

Findings and Conclusions

The County of Maui's fiscal year 1995 Consolidated Plan has identified the production of affordable rental housing units for families of five (5) or more persons as a priority housing need. It should be noted that between January 31, 1991 to January 31, 1995, approximately 2,000 Maui County families have been placed on the waiting list for rental housing assistance.

With regard to this acknowledged need, the proposed project will complete a system of vertical integration of services and assist graduates of the Homeless Center's transitional housing program, as well as other families and individuals, to move from a state of dependency and homelessness to self-sufficiency and affordable, long-term housing.

Currently, there are no recreational facilities located within the immediate vicinity of the project site. As such, the proposed design and development of the future park facility is anticipated to address and accommodate, the recreational needs of Maui residents and the surrounding community.

Construction of the proposed project will involve short-term environmental effects typically associated with construction activities. To mitigate air quality and noise impacts, construction activities will be limited to daylight hours. Appropriate dust control measures such as sprinkling, watering, and revegetation, will be undertaken to minimize fugitive dust. Although ambient noise conditions may be temporarily affected by construction activities, no significant adverse effects are anticipated.

From a long-term perspective, the proposed project is not anticipated to result in any adverse environmental impacts. There are no rare, endangered or threatened species of flora and fauna within or in proximity of the project site. An archaeological inventory survey of the project site did not yield any significant cultural artifacts or remains. Should any artifacts or remains be encountered, construction activities in the immediate area will be halted and the State Historic Preservation Division (SHPD) will be notified. The project site is not part of a scenic corridor and the proposed improvements are not anticipated to have an adverse impact upon the visual character of the surrounding area.

With regard to short-term socio-economic impacts, construction-related employment is anticipated to have a positive effect on the local economy. In addition, the proposed project is anticipated to fulfill an immediate and significant need in the community for affordable rental housing and the development of recreational facilities.

On a long-term basis, the proposed development is not anticipated to have any adverse impacts upon public services or infrastructure systems. Applicable water, sewer, and drainage system improvements will be implemented for the development of the project.

Adjoining roadway improvements will be undertaken by the County and facilitate access to the project site as well as improve regional traffic circulation. The proposed project will also benefit the community by providing long-term affordable housing for low-income families and individuals earning no more than 50 percent of the Maui County median family income. In addition, the development of the future park facility will expand the existing network of County recreational facilities as well as provide additional recreational opportunities for the community.

Based on the foregoing assessment, the proposed project will not result in any significant adverse environmental impacts.

Chapter 1

Introduction

I. INTRODUCTION

A. PROJECT LOCATION, EXISTING USE, AND LAND OWNERSHIP

In partnership with the County Department of Housing and Human Concerns (DHHC), the applicant, Maui Economic Concerns of the Community, Inc. (MECC), a local non-profit organization also known as Ka Hale A Ke Ola, is proposing to construct an affordable rental housing facility for low-income families and individuals in Wailuku, Maui, Hawaii. In addition, the County Department of Parks and Recreation (DPR) is also proposing to undertake the design and preparation of plans, specifications, and estimates for an adjoining future park facility. Identified by TMK (2) 3-8-46:21, the 15-acre project site is further described as Lot 2-A and will be subsequently subdivided into two (2) lots, Lot 2-A-1 consisting of approximately twelve (12) acres, and Lot 2-A-2 containing three (3) acres.

The project site is bordered by MECC's Homeless Resource Center to the north. In addition to undeveloped lands to the east and south, the project site is also bordered by Waiale Reservoir to the east and the 3.0 million gallon Kahului Reservoir to the south. A cane-haul road and the Wailuku Project District are located to the west of the project site. See Figure 1 and Figure 2.

Currently, the project site is undeveloped and predominantly vegetated with koa haole, kiawe, buffelgrass, and introduced grass species. Access to the project site is provided by an existing access easement along a cane-haul road located immediately south of, and adjacent to Waiale Road.

The County of Maui is the fee simple owner of the underlying property. The project site is designated Urban and Public/Quasi-Public by the State

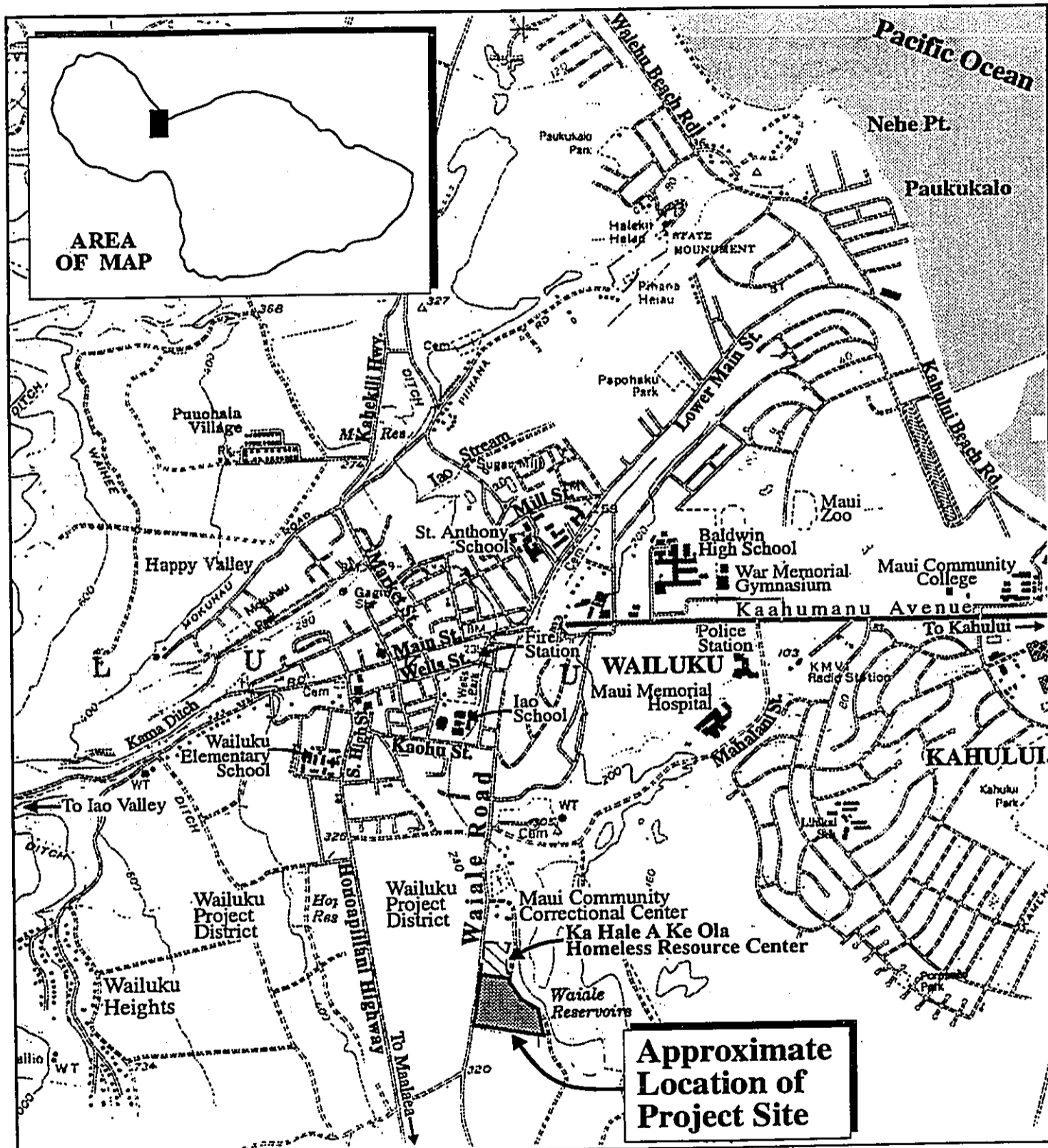


Figure 1 Waiale Road Affordable Rental Project Regional Location Map



Prepared for: Maui Economic Concerns of the Community, Inc.

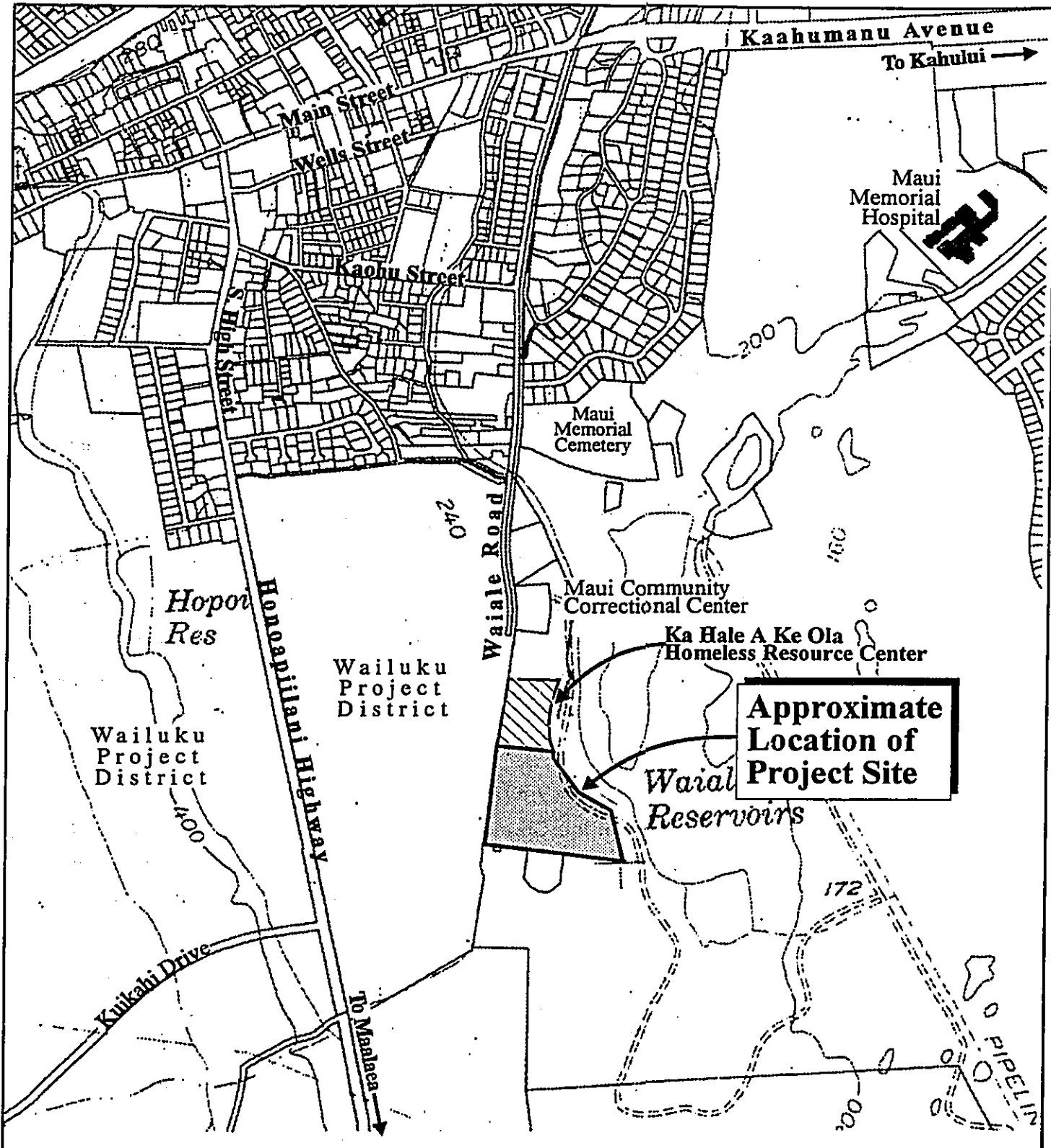


Figure 2 Waiale Road Affordable Rental Project Property Location Map



Prepared for: Maui Economic Concerns of the Community, Inc.

Land Use Commission and Wailuku-Kahului Community Plan, respectively. Currently, the project site is located within the Interim Zoning District as reflected by Maui County zoning.

B. PROJECT NEED

1. Affordable Rental Housing

As the developer and operator of the Ka Hale A Ke Ola Homeless Resource Center, MECC has provided transitional housing and support services which have enabled homeless families and individuals to move from a state of dependency and homelessness and become self-sufficient, independent members of the community. In addition to providing transitional housing for up to 24 months, the Homeless Center also offers medical and child day care facilities, transportation services, an intergenerational literacy program, and a substance abuse component. The facility also provides emergency food and housing, as well as case management, referral, and counseling services.

Since the adequacy of affordable rental housing in Hawaii is a major concern, the County of Maui's fiscal year 1995 Consolidated Plan has identified the production of affordable rental housing units for families of five (5) or more persons as a priority housing need.

With regard to this acknowledged need, the proposed project will complete a system of vertical integration of services and assist graduates of the Homeless Center's transitional housing program, as well as other families and individuals, to move from a state of dependency and homelessness to self-sufficiency and affordable, long-term housing.

2. **Park Development**

The DPR is proposing to undertake the design and preparation of plans, specifications, and estimates for the construction of a future three (3) acre park. The future park will expand the existing network of County recreational facilities, and is also anticipated to address, as well as accommodate, the recreational needs of local residents and the surrounding community.

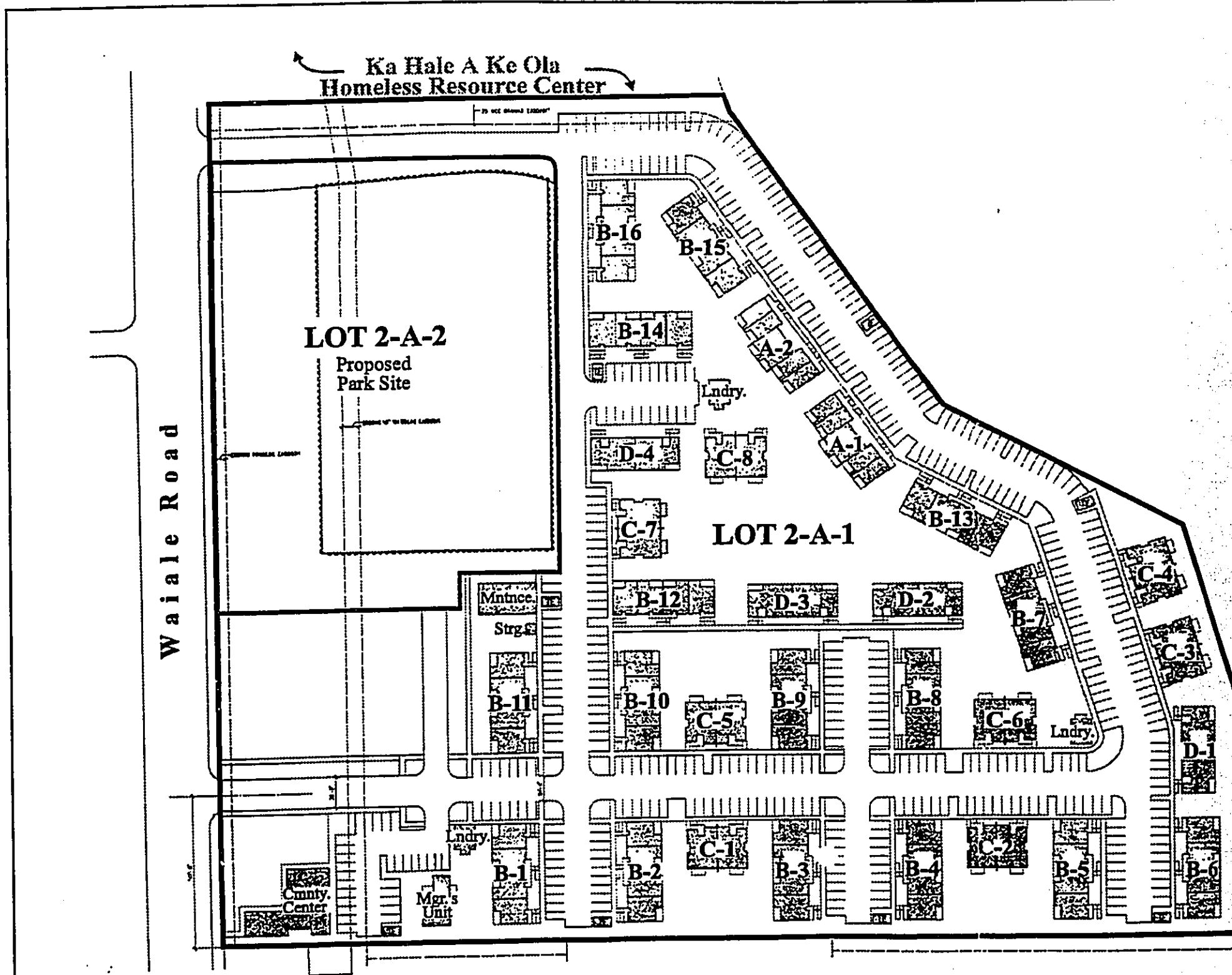
C. **PROPOSED IMPROVEMENTS**

Identified as Lot 2-A, the 15-acre project site will be subdivided into two (2) lots, Lot 2-A-1 and Lot 2-A-2. The proposed project, consisting of two (2) components, will involve the development of an affordable rental housing facility and related improvements on Lot 2-A-1 and the design and preparation of plans, specifications, and estimates for a future park facility on Lot 2-A-2. See Figure 3.

1. **Affordable Rental Housing**

Consisting of approximately twelve (12) acres, Lot 2-A-1 is proposed for development as an affordable rental housing facility for long-term, low-income occupancy. The proposed facility will consist of 200 unfurnished apartment units, a community center, and a manager's unit and office, as well as laundry, storage, and maintenance buildings. In addition to related parking, drainage, and landscaping improvements, a privately operated sewer pump station is also proposed.

A total of 30 two-story buildings containing 24 studio units, 128 two-bedroom units, 32 three-bedroom units, and 16 four-bedroom units will be constructed for occupancy. Each studio and two-bedroom unit will consist of 420 sq. ft. and 737 sq. ft. of living area,



Source: GYA Architects, Inc.

Figure 3

Waiale Road Affordable Rental Project
Site Plan



Prepared for: Maui Economic Concerns of the Community, Inc.

KEY



Studio Buildings



2 Bedroom Buildings



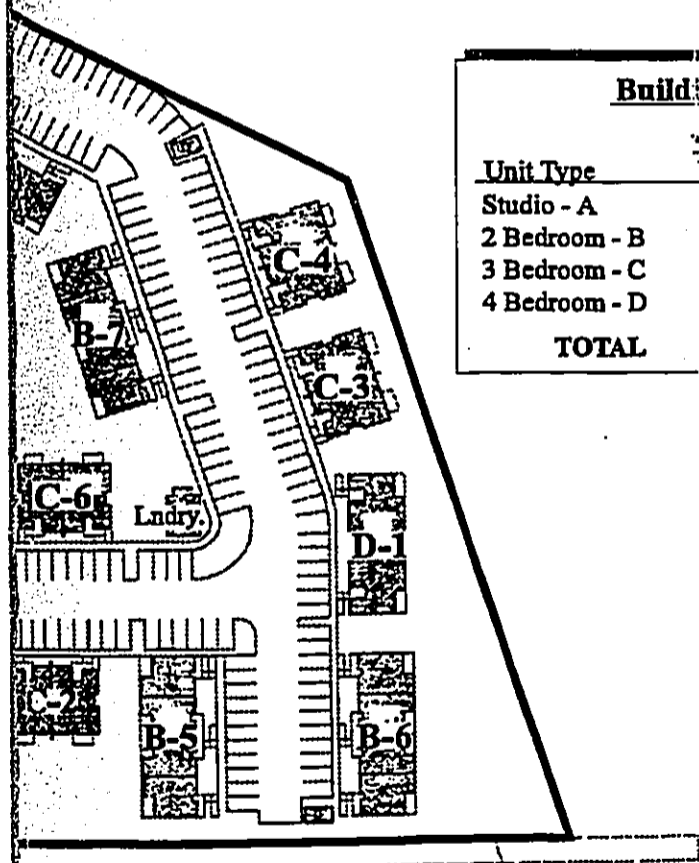
3 Bedroom Buildings



4 Bedroom Buildings

Building Unit Information

Unit Type	No. of Units	No. of Bldgs.	Units/ Bldg.	No. of Stories
Studio - A	24	2	12	2
2 Bedroom - B	128	16	8	2
3 Bedroom - C	32	8	4	2
4 Bedroom - D	16	4	4	2
TOTAL	200	30	N/A	N/A



Rental Project



NOT TO SCALE

respectively, while the three- and four-bedroom units will contain 1,059 sq. ft. and 1,180 sq. ft., respectively. Each unit will also include lanais ranging in area from 76 sq. ft. to 98 sq. ft. Consisting of approximately 3,400 sq. ft., the proposed community center will include a multi-purpose room, classroom, kitchen, storage room, and two (2) bathrooms. It should be noted that common area facilities and ten (10) first floor units will be handicapped accessible and equipped. See Appendix A.

The proposed facility will provide affordable rental housing for families and individuals earning 50 percent or less than the 1995 Maui County median family income of \$49,300.00. Including electrical, water, and trash collection fees, rents are projected to range from \$425 per month for a studio unit, to \$625 per month for a four-bedroom unit.

County funds from Multi-Family Private Activity General Obligation Bonds for Non-Profits, State rental housing trust funds, Federal HOME funds, as well as private funds and grants, will be utilized for the development of the proposed affordable rental housing facility. Currently, MECC is in the process of negotiating a 55-year lease with the County for the use of Lot 2-A. The long-term lease is anticipated to be executed prior to July 31, 1995.

2. **Park Development**

Consisting of three (3) acres, Lot 2-A-2 will be developed as a County park facility. Refer to Figure 3. Utilizing Community Development Block Grant (CDBG) program funds, the DPR is proposing to undertake the design and preparation of plans, specifications, and estimates for the future park facility. Future

park improvements will be also implemented by the DPR and will consist of a sports field, parking and restroom facilities and an open space area for passive recreational activities.

Primary access to the park will be provided via a left-turn lane from the affordable rental housing facility's all-movement southern driveway, while a secondary access will be provided via the facility's limited movement (e.g., right-turn in, right-turn out) northern driveway.

D. ENVIRONMENTAL REVIEW

Since the proposed project involves County land and funding, as well as State and Federal (e.g., HOME, CDBG) funding, an Environmental Assessment has been prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes (HRS), and Chapter 200 of Title 11, Department of Health Administrative Rules, Environmental Impact Statement Rules, and 24 CFR Part 58, U.S. Department of Housing and Urban Development (HUD), Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities.

E. PROJECTS IMPLEMENTATION

It should be noted that the development of the rental housing facility will be implemented through Section 201E-210, HRS, as coordinated with the DHHC. Accordingly, exemptions and waivers from certain regulatory and statutory requirements relating to zoning, assessments, construction, subdivisions, public services, and administrative procedures are being requested.

In accordance with Section 201E-210, HRS, the project application will be submitted for legislative review by the Maui County Council. Upon its

receipt, the Council will have 45 days to approve or disapprove the application. If the application is not disapproved by the 46th day, it shall then be deemed approved by the Council. The project application is anticipated to be submitted to the Council in August 1995.

Approximately \$14 million will be utilized for the development of the proposed facility and the design and preparation of plans, specifications, and estimates for the future park. Construction of the proposed affordable rental housing facility is anticipated to commence by the end of 1995. Once site work has been completed, the proposed facility will be developed in three (3) construction phases over an 18-month period.

A preliminary estimate of construction costs related to the development of the future park facility is approximately \$0.5 million. The completion of the future park improvements is anticipated to coincide with the conclusion of construction activities for the affordable rental housing facility.

Chapter II

Description of the Existing Environment

II. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. Surrounding Land Uses

With a land area of approximately 727 square miles, the island of Maui is the second largest of the Hawaiian Islands. Maui is flanked by the islands of Molokai to the northwest, Lanai to the west, Kahoolawe to the southwest, and the "Big Island" of Hawaii to the southeast.

Situated along the isthmus separating Mount Haleakala from the West Maui Mountains, the town of Wailuku serves as the County seat of government. The town of Kahului, approximately two (2) miles east of Wailuku contains the State's second busiest airport and harbor and has emerged as the Island's center of commerce.

The project site is bordered by Maui Economic Concerns of the Community's, Inc. (MECC) Homeless Resource Center to the north, as well as Waiale Reservoir and densely vegetated, undeveloped lands to the east. The undeveloped lands of the Maui Lani Project District and the 3.0 million gallon Kahului Reservoir (under the jurisdiction of the Board of Water Supply) abuts the project site to the south. In addition, a cane-haul road proposed for the Waiale Road Extension and lands within the developing Wailuku Project District adjoin the project site to the west.

Situated along Waiale Road, land uses within proximity of the project site include the Maui Community Correctional Center (MCCC), Maui Memorial Park's Garden of Meditation and several single-family residences and commercial establishments.

2. **Climate**

Hawaii's tropical location accounts for generally uniform weather conditions throughout the year. Climatic conditions on Maui are characterized by mild and consistent year-round temperatures, moderate humidity, and steady northeasterly tradewinds. Variations in the Island's weather are attributable to regional topographical and climatic conditions.

Based on data collected by the National Weather Services' meteorological facility at the Kahului Airport, average monthly temperatures for 1993 ranged from nearly 70 degrees in February, to about 80 degrees in August. The average annual temperature measured approximately 76 degrees. In addition, rainfall for 1993 ranged from a low of 0.9 inch in June, to a high of 2.19 inches in January. Total annual precipitation measured 12.69 inches (County of Maui/MEDB, Inc., December 1994).

The Island of Maui lies within the path of the northeast tradewinds which predominate throughout most of the year. Although winds may occasionally gust, the tradewinds typically range from ten (10) to twenty (20) miles per hour (mph) during afternoons, with lighter wind conditions prevailing during the morning and evening hours. The diurnal heating and cooling of the land mass gives rise to onshore sea breezes during the day and offshore land breezes at night.

Between the months of October to April, storm-generated winds from the south spawn "Kona" storms which are often characterized by high winds and heavy rainfall. In the absence of the tradewinds and Kona storms, wind conditions may become light and variable.

3. **Topography and Soil Characteristics**

The project site is situated just south of Wailuku at the base of the West Maui Mountains. Sloping from the south to the north, the project site includes two (2) sand dunes which generally traverse the parcel in a north to south direction. Elevations at the project site range from about 290 feet mean sea level (msl) to approximately 220 feet msl.

Underlying the project site and surrounding area are soils of the Pulehu-Ewa-Jaucus association. See Figure 4. Found on level to moderately sloping terrain, this association consists of deep, well-drained soils that have a moderately fine textured to course textured subsoil.

lao silty clay (laA) and Puuone sand (PZUE) define the soil types related to the project site and adjoining area. See Figure 5. The lao series consists of well-drained soils on valley fill, as well as alluvial fans that are derived from basic igneous rock. Typified by slopes ranging from 0 to 3 percent, lao silty clay is characterized by slow runoff and slight erosion hazards. Consisting of excessively drained soils that have been primarily derived from coral and sea shells, the Puuone series is typified by slopes ranging from 7 to 30 percent, as well as slow runoff, rapid permeability and moderate to severe wind erosion hazards. The lao series is primarily utilized for sugar cane cultivation, while the Puuone series is generally used for pastures and homesites.

4. **Flood and Tsunami Hazard**

The project site is located at the eastern base of the West Maui Mountains. As indicated by the Flood Insurance Rate Map for the

LEGEND

- | | |
|--|--|
| <p>① Pulehu-Ewa-Jaucas association</p> <p>② Waiahoa-Keahua-Molokai association</p> <p>③ Honolulu-Olelo association</p> <p>④ Rock land-Rough mountainous land association</p> <p>⑤ Puu Pa-Kula-Pane association</p> <p>⑥ Hydrandepts-Tropaquods association</p> | <p>⑦ Hana-Makanlao-Kailua association</p> <p>⑧ Pauwela-Haiku association</p> <p>⑨ Laumaia-Kaipoi-Olinda association</p> <p>⑩ Keawrakapu-Makena association</p> <p>⑪ Kamaoie-Oanapuka association</p> |
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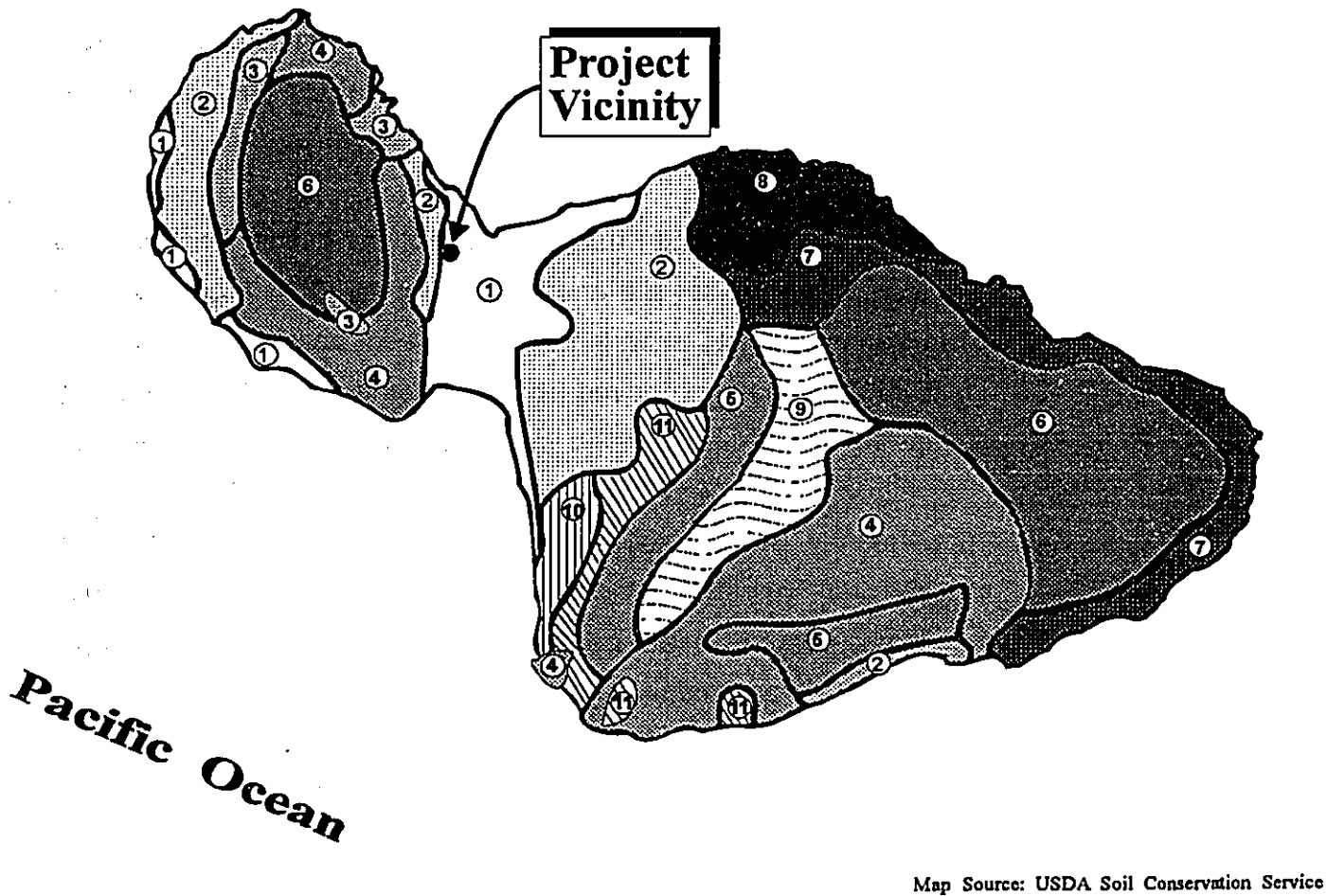


Figure 4 **Waiale Road Affordable Rental Project**
Soil Association Map



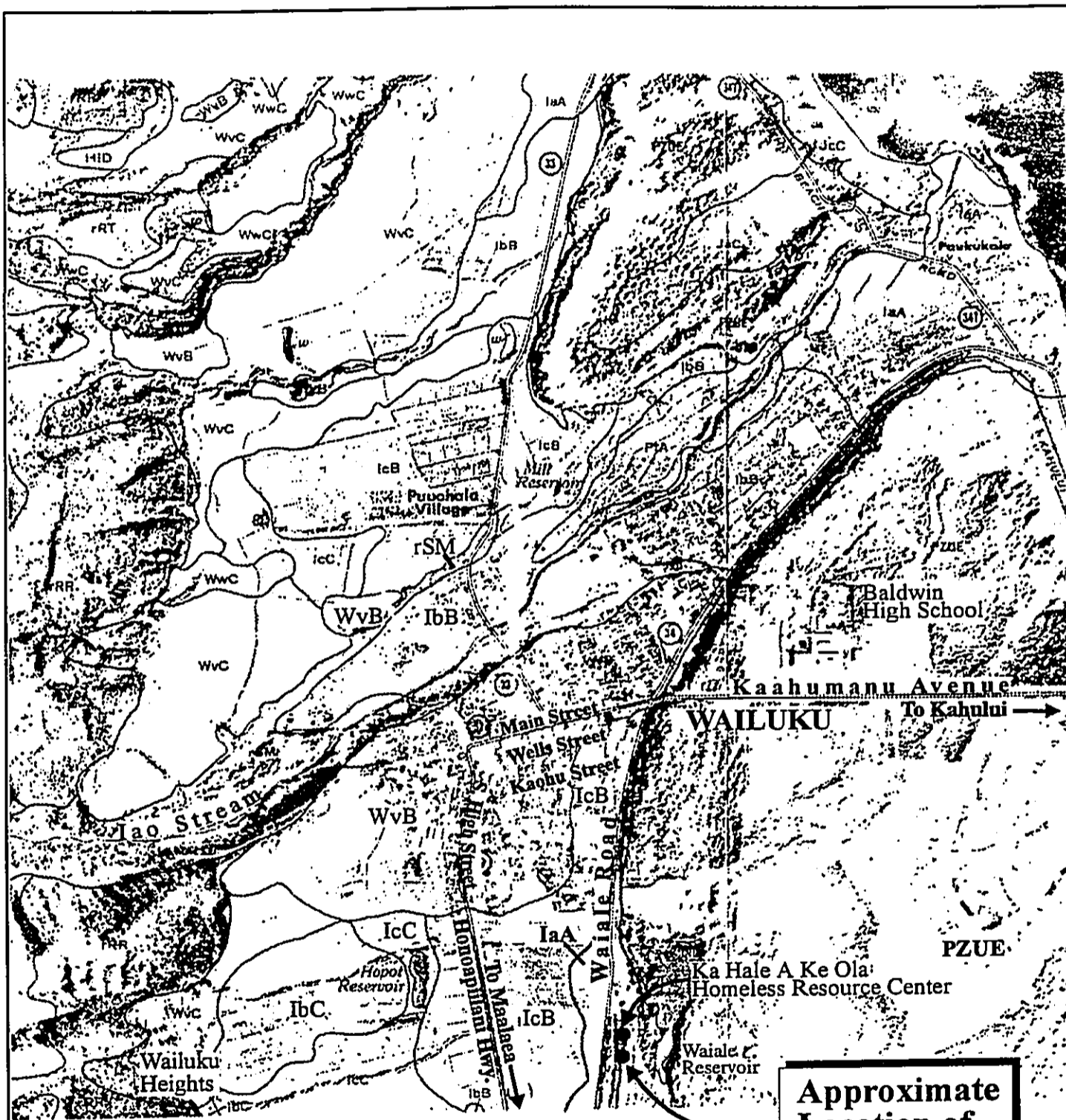


Figure 5

Waiale Road Affordable Rental Project
Soil Classification Map



Prepared for: Maui Economic Concerns of the Community, Inc.

County of Maui, the project site is situated within Zone C, an area of minimal flooding. See Figure 6.

5. **Flora and Fauna**

Vegetation within the project site consists of moderate koa haole cover along ridges, as well as moderate to dense stands of kiawe trees along the flanks and bases of sand dunes. In addition to buffelgrass, introduced grass species provide a dense understory growth which covers most of the ground surface. Although less abundant, other plant species include scattered ilima shrubs and isolated uhalou.

Terrestrial fauna in the region include introduced species, such as cats, mice, rats, and mongoose. Some of the avifauna introduced to the area include the Spotted Dove, Barred Dove, Japanese White-Eye, Cardinal, Red-Crested Cardinal, and Mynah.

There are no wetlands and no known rare, endangered, or threatened species of flora and fauna located within the project site.

6. **Archaeological Resources**

The subject property is dominated by two (2) sand dunes which generally traverse the site in a south to north direction. Located within its eastern and western quadrants, the sand dunes range in height from approximately 30 to 40 feet, respectively.

Sand dunes have historically served as prime locations for Hawaiian burials. Previously, grading activities related to the construction of MECC's adjoining Homeless Resource Center

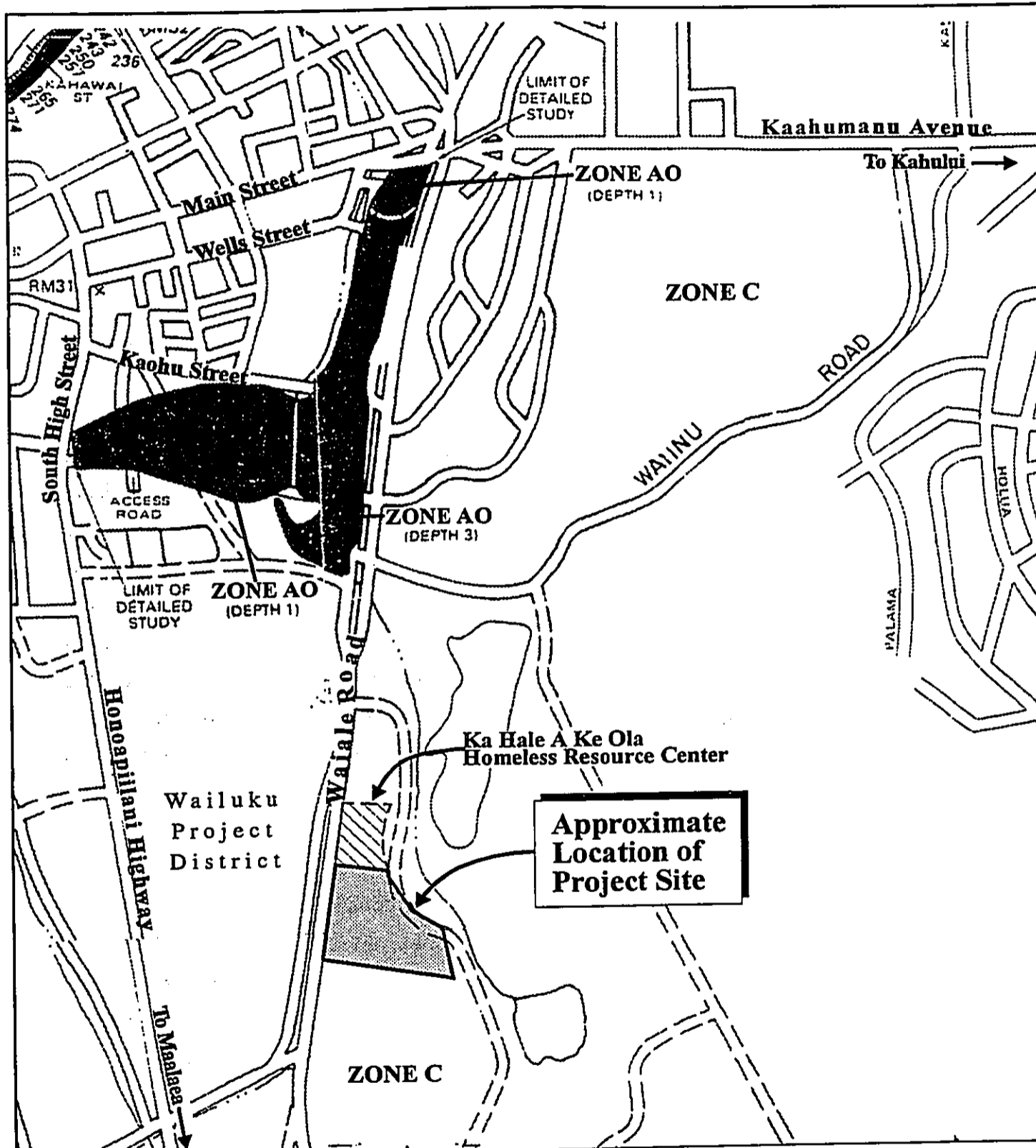


Figure 6

Waiale Road Affordable Rental Project
Flood Insurance Rate Map



Prepared for: Maui Economic Concerns of the Community, Inc.

uncovered human remains from a section of the eastern sand dune which formerly extended onto that site. Accordingly, an archaeological inventory survey of the project site was undertaken by Xamenek Researches in May 1995. See Appendix B. The survey was conducted in two (2) phases and involved a complete pedestrian survey of the entire project site, followed by subsurface investigation consisting of backhoe trenches, auger tests, and manual test units.

Undertaken by field personnel spaced about fifteen (15) feet apart, the project site was transected in a north to south direction utilizing flagging tape to demarcate sweep corridors in areas of dense vegetation. In addition to modern era refuse, several abandoned automobiles and tires were located in the southeastern quadrant of the project site. A bulldozed access road, cleared core sites for a recent soils study, and an old plantation access road provided the only surface evidence of recent disturbances within the project site. Stable vegetative cover and exposed, lithified sand formations also indicated that the sand dunes were generally not heavily disturbed in the past.

The second phase of investigation consisted of subsurface testing. A total of 43 back hoe trenches, 21 auger tests, and two (2) manually excavated test units were completed. The test results indicated that the majority of the sampled areas were not heavily disturbed in the past. Although evidence of an ephemeral stream that once flowed between the sand dunes was discovered, there were no material cultural remains associated with the subsurface stream bed. Traversing the project site in a north to south

direction, an 18-inch underground water transmission line was located in the western quadrant of the site.

The pedestrian survey yielded no surface evidence of significant cultural resources. In addition, there was no "in situ" evidence of historic or indigenous cultural deposits encountered during the subsurface testing. In conclusion, the inventory survey did not yield any evidence of significant cultural resources within the project site.

7. **Air Quality**

There are no point sources of airborne emissions within proximity of the project site. Air quality in the vicinity of the project site may be affected by a variety of sources, including smoke and dust from sugar cane harvesting and cultivation operations to the east. Although minimal, airborne pollutants are largely attributable to vehicular exhaust from traffic along the region's roadways. However, these sources are intermittent and prevailing winds quickly disperse the particulates generated by these temporary sources. Overall, air quality in the Wailuku region is considered good.

8. **Noise**

The project site is surrounded by lands which are currently utilized for public-quasi public use (e.g., MCCC), as well as existing (e.g., Homeless Resource Center, Wailuku Project District) and future (e.g., Maui Lani Project District) single and multi-family residential development. In addition, future roadway improvements involving the widening and extension of Waiale Road are also proposed. With the exception of traffic along regional roadways, as well as

construction activities occurring within the Wailuku Project District, ambient noise conditions are generally attributable to natural conditions such as wind and rain. Vehicular noise levels in proximity of the project site are minimal due to the low traffic volume along this segment of Waiale Road.

9. **Scenic and Open Space Resources**

Ranging in elevation from approximately 290 feet msl to about 220 feet msl, the project site is characterized by dense vegetation and two (2) sand dunes which traverse the parcel in a generally north to south direction. In addition to Mount Haleakala to the east, Iao Valley and the West Maui Mountains define the scenic resources to the west of the project site. With the exception of the Waiale Reservoir, there are no notable physical features within immediate proximity of the project site.

B. **SOCIO-ECONOMIC ENVIRONMENT**

1. **Population and Income**

The population of Maui County has demonstrated relatively strong growth over the past decade as exemplified by a 52 percent increase in resident population from 71,600 in July 1980 to 108,000 in July 1992 (County of Maui/MEDB, Inc. December 1994). Growth in the County is expected to continue, with resident population projections estimated to be 112,349 and 133,459 for the years 2000 and 2010, respectively (Community Resources, Inc., January 1994).

The Wailuku-Kahului region is anticipated to follow the Countywide population growth pattern with the region's 1990 population of 32,816 projected to increase to 40,452 by the year 2000 and

48,132 by the year 2010 (Community Resources, Inc., January 1994).

In 1995, the median income for a family of four (4) in Maui County was \$49,300.00 (telephone conversation with Department of Housing and Human Concerns employee, Wayde Oshiro, July 1995).

2. **Economy**

Wailuku serves as the County's seat of government, and combined with neighboring Kahului, provides a broad range of commercial, financial, governmental, light-industrial, and service-oriented activities. The Wailuku-Kahului region is also surrounded by productive agricultural lands which include macadamia nut orchards, as well as pineapple and sugar cane fields. This vast expanse of agricultural land, managed by Hawaiian Commercial & Sugar Company and Wailuku Agribusiness Company, Inc., is considered a key component of the local economy.

3. **Housing**

The cost and adequacy of housing in Hawaii is a Statewide concern that is not confined to any particular area, island or County. According to real estate sales statistics for the first five (5) months of 1995, the median price of a single-family home on Maui was approximately \$270,000.00, while the median price of a condominium during the same period was approximately \$161,000.00. Current market-priced, multi-family rentals in central Maui range from about \$650 to \$675 for a one-bedroom unit, and approximately \$675 to \$900 for a two-bedroom unit (ACM Real Estate Appraisers, July 1995).

As determined by HUD, very low-income households are those households whose incomes do not exceed 50 percent of an area's median income. In 1990, nearly one-fifth, or 5,641 of the Island's 30,272 households earned no more than 50 percent of the Maui County median family income.

By 2000 and 2010, the number of households is estimated to increase to 37,947 and 46,063, respectively. Similarly, the number of households in the 50 percent or less income category is also projected to increase to 7,108 and 8,708, respectively (Community Resources, Inc., January 1995). Currently, the median income for a family of four (4) for Maui County in 1995 is \$49,300.00 (telephone conversation with Department of Housing and Human Concerns employee, Wayde Oshiro, July 1995).

C. PUBLIC SERVICES

1. Recreational Facilities

County recreational facilities are administered and maintained by the Department of Parks and Recreation (DPR). The Wailuku-Kahului region contains a network of recreational facilities comprised of mini-parks, as well as neighborhood and district parks. The region's seven (7) mini-parks are distributed uniformly throughout the area, while the region's eleven (11) neighborhood and three (3) district parks provide a wide range of facilities to meet the recreational needs of the community. In addition, regional-type facilities, such as the Maui Zoo and Botanical Gardens, War Memorial Center, and Waiehu Golf Course, also provide a variety of facilities and activities for the community. It should also be noted that many of the region's secondary schools include

adjoining playing fields which supplement the recreational facilities provided by the County park system.

County parks and recreational facilities within proximity of the project site include: Wells Park, Wailuku Heights Park, Wailuku Gym and Pool, Wailuku Elementary School Park, and Waikapu Park and Community Center. Consisting of gyms, playgrounds, swimming pools, and community centers, as well as sports courts and playing fields, these facilities provide opportunities for basketball, jogging, picnicking, soccer, swimming, tennis, walking, field sports, and social activities.

It has been estimated that the Wailuku-Kahului region will need approximately 200 acres of park land to satisfy the recreational needs of the community for the next twenty (20) years (R.M. Towill Corp., August 1992). Currently, there are no neighborhood parks situated within the immediate vicinity of the project site.

Utilizing Community Development Block Grant program (CDBG) funds, the DPR is proposing to undertake the design and preparation of plans, specifications, and estimates, for the future development of a three (3) acre park on Lot 2-A-2. Proposed park improvements will consist of a sports field, parking and restroom facilities, and an open space area for passive recreational activities (e.g., picnicking).

With regard to recreational needs, the proposed design and development of the future park facility is anticipated to address, as well as accommodate, the recreational demands of Maui residents and the surrounding community.

2. **Police and Fire Protection**

With headquarters located in Wailuku, approximately 1.2 miles northeast of the project site, police and security services for Maui County are provided by the Maui Police Department (MPD). The MPD consists of 369 administrative, patrol, and support personnel. Including the Wailuku patrol district, MPD's uniformed patrol bureau also serves the Hana, Lahaina, Lanai, and Molokai patrol districts (MPD, December 1992).

Fire prevention, suppression, and protection services for the Wailuku-Kahului region are provided by the Maui Fire Department's (MFD) Wailuku Fire Station, about 0.8 mile to the north of the project site. Additional support is also provided by the MFD's Kahului station, approximately 3.5 miles to the east of the project site.

3. **Solid Waste**

Single-family residential solid waste collection service is provided on a weekly basis by the County Department of Public Works and Waste Management (DPWWM) - Solid Waste Division. With the exception of the Hana region, solid waste from throughout the island is transported to the 55-acre Central Maui Landfill of Pulehu Road, approximately nine (9) miles southeast of the project site. In addition to the Hana landfill, the Central Maui Landfill is the only disposal site which accepts County-hauled residential waste, commercially hauled waste, and self-hauled waste.

4. **Medical Services**

Maui Memorial Hospital serves as the Island's only major medical facility. Located in Wailuku, approximately one (1) mile northeast

of the project site, the 145-bed facility provides acute, general, and emergency care services for the Island's residents. In addition, numerous privately operated medical and dental clinics as well as offices also provide health care services for the region's residents.

It should be noted that MECC's adjoining Homeless Resource Center contains an on-site primary care medical facility.

5. **Schools**

The Wailuku-Kahului region is served by the State Department of Education's (DOE) public school system. Privately operated facilities within the region, such as Christ the King, Emmanuel Lutheran, Kaahumanu Hou and St. Anthony Schools, provide educational services for the Island's students as well.

DOE facilities in the Wailuku area include Wailuku Elementary School (Grades K-5), Iao Intermediate School (Grades 6-8), and Baldwin High School (Grades 9-12). Wailuku Elementary School and Iao Intermediate School are located about 0.6 mile and 0.4 mile northwest of the project site, respectively, while Baldwin High School is situated about 1.2 miles to the northeast.

Existing facilities in the Kahului area include Lihikai and Kahului Schools (Grades K to 5), Maui Waena Intermediate School (Grades 6 to 8), and Maui High School (Grades 9 to 12). Maui Community College, a branch of the University of Hawaii system, serves as the island's only institution of higher learning.

D. INFRASTRUCTURE

1. Roadways

The project site and the Wailuku-Kahului region are served by a network of arterial, collector, and local roadways. Aligned in a north to south direction, Honoapiilani Highway is a two-lane State highway that provides regional circulation between Wailuku and West Maui. As Honoapiilani Highway enters Wailuku from the south, it becomes High Street. Through rural areas, the posted speed limit along Honoapiilani Highway is 45 mph, while in urban areas it decreases to 20 mph.

Linking Wailuku and Kahului, Kaahumanu Avenue is a four- to six-lane divided State highway that is aligned in a east to west direction. Kaahumanu Avenue traverses the commercial areas of Kahului and proceeds in a westerly direction until it becomes Main Street as it enters the town of Wailuku. West of its intersection with Kahului Beach Road, Kaahumanu Avenue is a four-lane divided highway with a posted speed limit of 45 mph.

Main Street is a two-lane roadway that serves as the primary roadway through the town of Wailuku. Aligned in a east to west direction, Main Street includes separate turn lanes at major signalized intersections.

Waiale Road is a two-lane County roadway that is aligned in a north to south direction. At its northern terminus, Waiale Road passes beneath the Main Street/Kaahumanu Avenue overpass and becomes Lower Main Street. At its southern extent, Waiale Road terminates at the southern entrance to MCCC, approximately 800 feet north of the project site.

Kuikahi Drive is a two-lane County roadway that currently provides access to the Wailuku Heights Subdivision. Aligned in an east to west direction, Kuikahi Drive intersects Honoapiilani to the west of the developing Wailuku Project District, forming a stop-controlled T-intersection.

Access to the project site is provided via Waiale Road and an existing access easement along a cane-haul road owned by Wailuku Agribusiness Company, Inc., located directly south of, and adjacent to Waiale Road.

2. **Water**

The Wailuku-Kahului region is served by the Department of Water Supply's (DWS) domestic water system. Situated in the vicinity of Iao Stream and Waiehu Stream, water drawn from the Iao Aquifer supplies the Central Maui Water System. The system services the communities of Waiehu and Waihee to the north, Wailuku, Kahului, and Paia to the east, as well as Maalaea, Kihei, and Makena to the south. See Appendix C.

The Iao Aquifer has an estimated sustainable yield of 20 million gallons per day (mgd). Recent estimates place the average monthly basal water withdrawal from the aquifer at approximately 19 mgd (telephone conversation with Department of Water Supply employee, Ellen Kraftsow, March 1995).

The Iao tunnel source provides domestic water for properties along Waiale Road. The intake for this source is located at an elevation of 782 feet, approximately 900 feet west of Kepaniwai Park. This

source is supplemented by a well which taps high level dike water and is situated north of Kepaniwai Park at an elevation of 713 feet.

Located southwest of the Alu Road and Iao Road intersection, the recently completed 3.0 million gallon (mg) Iao Reservoir provides water storage for the project site and surrounding area.

Extending nearly 1.7 miles, a 12-inch waterline conveys water from the Iao tunnel source and Kepaniwai well to the Iao Reservoir. From the reservoir, an 18-inch waterline along Iao Road conveys water to a high level distribution system in Wailuku at the beginning of High Street. A network of 12- and 8-inch waterlines then distributes water to properties along Waiale Road south to the Homeless Resource Center entrance. An 18-inch water transmission line also traverses the western quadrant of the project site.

3. **Wastewater**

An existing 8-inch sewerline fronting the project site adjoins Waiale Road and the cane-haul road to the west. North of Spreckels Ditch, this collector line increases in size to ten (10) and twelve (12) inches and traverses the residential properties west of Waiale Road before connecting to a gravity line at Lower Main Street, north of the Kaahumanu Avenue overpass. See Appendix C.

As a result of the development of the Wailuku Project District, the developer was required to install a new 18-inch gravity sewerline along Waiale Road between Spreckels Ditch and the Kaahumanu Avenue overpass. The installation of the new sewerline is

approximately 90 percent complete and is anticipated to be operational soon.

North of the Kaahumanu Avenue overpass, a series of 12-, 15-, and 18-inch sewerlines, along Lower Main Street, convey wastewater flows to the Wailuku pump station, located east of Waiehu Beach Road. Utilizing an 18-inch force main, this station pumps sewage from Wailuku, Waiehu, and portions of Kahului to the Wailuku-Kahului Wastewater Reclamation facility for final treatment and disposal.

The Wailuku-Kahului Wastewater Reclamation Facility is located approximately seven (7) miles to the northeast of the project site. The design capacity of the facility is 7.9 mgd, and excluding groundwater and stormwater infiltration, current sewage flow volume treated by the facility is approximately 6.28 mgd (telephone conversation with Department of Public Works and Waste Management employee, Dave Taylor, March 1995). Approximately 88 percent of the total sewage flow treated at the facility is attributable to the Wailuku-Kahului region.

4. **Drainage and Erosion**

The project site generally slopes in a south to north direction and ranges in elevation from approximately 290 feet msl to about 220 feet msl with a slope of 7 percent. The project site and adjoining undeveloped areas are densely vegetated with grasses, kiawe trees, and koa haole shrubs. See Appendix C.

Runoff currently generated by the project site for a 10-year storm recurrence interval is estimated at approximately 17.8 cubic feet

per second (cfs). Presently, runoff from lands to the west of the project site do not flow onto the site.

There are no existing drainage system improvements serving the project site. On-site runoff sheet flows across the project site in a south to north direction.

5. Electrical and Communication Services

Electrical and telephone service to the project site are available through Maui Electric Company, Ltd. and GTE Hawaiian Telephone Company, Inc., respectively. Cable television service is provided by Chronicle Cablevision of Hawaii.

Chapter III

Potential Impacts and Mitigation Measures

III. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. IMPACTS TO THE PHYSICAL ENVIRONMENT

1. Surrounding Land Uses

The project site adjoins an area of existing and future residential development. MECC's Homeless Resource Center adjoins the project site to the north, while the Wailuku Project District, currently under development, is located to the west. In addition, the Maui Lani Project District, proposed for future development, adjoins the project site to the south, while the Waiale Reservoir and undeveloped lands typify land uses to the east.

The project site is currently vacant and undeveloped. As a result, the proposed project will not involve the displacement or relocation of any residents within the project site or surrounding area.

The proposed project will provide affordable rental housing for graduates of MECC's Homeless Resource Center transitional housing program and other Maui residents. The proposed project will also provide a park designed to meet the recreational needs of Maui County residents. The development of the proposed project is consistent with adjacent and surrounding land uses and is not anticipated to create any adverse impacts.

2. Topography and Landform

Site work for Lot 2-A will involve excavation and filling operations, as well as clearing, grubbing, and grading activities. To the extent practicable, finished contours will follow existing grades to minimize earthwork costs and maintain existing drainage patterns.

While terrain within the project site will be locally modified to meet design requirements, the proposed residential and park use of the property is not anticipated to alter the uniform slope characteristics of the surrounding environs.

3. **Flora and Fauna**

There are no known significant habitats or rare, endangered, or threatened species of flora or fauna located on the project site. In addition, the proposed improvements are not anticipated to impact wetland areas and wildlife habitats. As such, the removal of vegetation and displacement of wildlife from the project site is not considered an adverse impact to this component of the natural environment.

With regard to avifauna, it should be noted that the endangered Hawaiian stilt is occasionally sighted in the Waiale Reservoir. However, according to the U.S. Fish and Wildlife Service, such occurrences are very rare. Another endangered specie, the dark-rumped petrel, could potentially traverse the region during its journey between its nesting colony on Haleakala and the ocean.

The project site is located to the west of Waiale Reservoir and is separated from the reservoir by undeveloped agricultural lands. Accordingly, the proposed project is not anticipated to adversely impact any avifauna within the area.

4. **Archaeological Resources**

The results of the recent archaeological inventory survey did not reveal any human remains or "in situ" cultural deposits. However, because the area consists of two (2) sand dunes, and as a result

of human remains being discovered on MECC's adjoining Homeless Resource Center parcel to the north, archaeological monitoring is recommended during any earth-moving activities. In the event that any human remains or artifacts be encountered, work will be halted and the State Historic Preservation Division (SHPD) will be notified. Applicable procedures to ensure compliance with Chapter 6E, Hawaii Revised Statutes (HRS) and Section 106, National Historic Preservation Act of 1966, will be implemented.

5. **Air Quality**

Emissions from construction equipment and other vehicles involved in construction activities may temporarily affect the ambient air quality within the immediate vicinity. However, these effects can be minimized by properly maintaining construction equipment and vehicles.

In addition, dust generated during construction, especially from earth-moving operations such as excavating, trenching, and filling, may also result in a temporary decrease in ambient air quality. Mitigation measures include utilizing dust barriers, waterwagons, and/or sprinklers to control dust, and watering graded areas upon the completion of daily construction activities and/or weekends and holidays to the extent practicable.

On a long-term basis, the proposed project will not generate adverse air quality impacts.

6. **Noise**

Ambient noise conditions may be temporarily affected by construction activities. Heavy construction machinery, such as backhoes, dump trucks, front-end loaders, paving equipments, and material-transport vehicles, are anticipated to be the dominant noise-generating sources during the construction period.

Proper equipment and vehicle maintenance are anticipated to minimize noise levels. Equipment mufflers or other noise attenuating equipment may also be employed as required. All construction activities will be limited to daylight working hours.

Once completed, the proposed project will not be subject to long-term adverse noise conditions.

7. **Scenic and Open Space Resources**

Elevations at the project site range from approximately 290 feet msl to about 220 feet msl. As viewed from the project site, Haleakala is visible to the east, and Iao Valley and the West Maui Mountains to the west.

The proposed project will integrate landscaping, low-rise structures, and open space areas to provide facilities that satisfy spatial requirements and is compatible with surrounding developments.

The proposed project is not part of a scenic corridor and will not affect views from inland vantage points. As such, the proposed project is not anticipated to have an adverse impact upon the visual character of the surrounding area.

B. IMPACTS TO THE SOCIO-ECONOMIC ENVIRONMENT AND PUBLIC SERVICES

1. Economy

On a short-term basis, the proposed project will support construction and construction-related employment. Upon completion and occupancy, families and individuals residing in the facility will contribute to the long-term support of the regional economy through purchases of goods and services from local merchants and providers. In addition, purchases relating to facilities maintenance would similarly benefit the local economy.

2. Housing

In recent years, Hawaii's housing inventory has improved in terms of supply, but is still outpaced by the demand for housing. The high cost and continued lack of affordable housing continues to create economic hardships for families, particularly low-income households. With limited vacancies and housing available at affordable prices, families often pay more than they can afford, accept poor quality housing, and/or live in overcrowded conditions. Increasingly, family members are forced to work at more than one job in order to keep household incomes apace with housing prices and rents.

The State of Hawaii Comprehensive Housing Affordability Strategy indicates that there is a critical need to construct more affordable housing units to meet the needs of very low, low, and moderate income families in the State of Hawaii (Housing Finance and Development Corporation, October 1991). Between January 31, 1991 to January 31, 1995, approximately 2,000 Maui County families have been placed on the waiting list for rental housing

assistance. Currently, a total of 1,744 families are on the waiting list. Of this total, 362 families reside in Wailuku, while an additional 372 families live in Kahului (telephone conversation with Department of Housing and Human Concerns employee, Milton Ito, July 1995).

In this regard, the proposed project is anticipated to fulfill an immediate and significant need in the community for affordable rental housing. In the long-term, the proposed project will benefit the community by providing long-term affordable housing for low-income families and individuals earning no more than 50 percent of the Maui County median family income.

3. Police, Fire, and Medical Services

Medical services for project residents will be available through the primary care medical facility at MECC's adjacent Homeless Resource Center. The proposed project is not anticipated to affect the service capabilities of police, fire, medical, and emergency medical operations. The existing service area limits for emergency services are not expected to be extended or affected.

4. Recreational and Educational Resources

The proposed design and preparation of plans, specifications, and estimates for the future park facility will enable the DPR to implement the development of the 3-acre park site. Construction of the future park improvements is anticipated to commence shortly after the awarding of construction bids, and is projected to be completed within the same time frame as the proposed affordable rental housing facility.

In the short-term, the proposed project is not anticipated to generate an immediate demand for recreational facilities.

From a long-term perspective, the future park will expand the existing network of County recreational facilities as well as accommodate the recreational needs of the community as well as local residents.

In addition to other families and individuals, the proposed affordable rental housing facility is anticipated to accommodate a significant number of graduates from MECC's transitional housing program. The proposed facility is also projected to generate approximately 96 students for Grades K-5, 36 students for Grades 6-8, and 40 students for Grades 9-12 (telephone conversation with Department of Education employee, Tom Saka, July 1995). Due to recent re-districting, there are no anticipated short-term impacts to school facilities and resources. In the long-term, Wailuku and Kahului households are anticipated to be the primary source of residents projected for the proposed affordable rental housing facility. Although the extent to which these households relocate to the proposed facility cannot be presently determined, coordination with the State Department of Education (DOE) will be undertaken to assess any potential effects the relocations may have on educational facilities and resources.

5. **Solid Waste**

A solid waste management plan will be developed in coordination with the Department of Public Works and Waste Management (DPWWM) - Solid Waste Division for the disposal of clearing and grubbing material from the project site during construction. Solid

waste collection and disposal services for the proposed project will be provided by a private waste contractor.

C. IMPACTS TO THE INFRASTRUCTURE

1. Roadways

Access to the project site is via Waiale Road, a two-lane County roadway, and an existing access easement along a cane-haul road owned by Wailuku Agribusiness Company, Inc., located immediately south of, and adjacent to Waiale Road. Refer to Appendix C.

In accordance with the regional traffic improvements recommended by the Island-Wide Long-Range Highway Plan - Draft Final Report and the Wailuku-Kahului Sub-Area Study, the DPWWM will be improving 0.625 mile segment of Waiale Road and the adjoining cane-haul road from Waenu Road, north of the Spreckels Ditch crossing, to Honoapiilani Highway. The Waiale Road Extension will consist of two (2) 12-foot wide travel lanes with adjoining 6-foot wide paved shoulders along each side. Funds available through the Federal Intermodal Surface Transportation Efficiency Act (ISTEA) will be utilized for the roadway improvements. Bids for construction are anticipated to be advertised by the end of 1995, with construction estimated to commence by the second quarter of 1996.

Proposed within a 60-foot right-of-way, improvements to Waiale Road and the adjoining cane-haul road include resurfacing, road widening, striping, as well as related ancillary, drainage and intersection improvements. In addition, Kuikahi Drive will also be

extended in an easterly direction from Honoapiilani Highway to connect to the Waiale Road Extension.

In connection with the development of the Wailuku Project District, its developer has agreed to dedicate a 60-foot right-of-way to the County in order to implement the Waiale Road Extension. Construction of the roadway improvements will be in accordance with applicable County design standards.

Where Waiale Road intersects Wailuku Project District subdivision roads, the developer of the project district has agreed to provide additional rights-of-way to accommodate the additional width needed for intersection geometrics (e.g., deceleration lanes, storage/turn lanes). In addition, the developer has also agreed to add two (2) additional travel lanes between Mahalani Street and Honoapiilani Highway as traffic warrants and future Wailuku Project District development occurs. Construction of the additional lanes will be in conformance with County standards and will also be funded by the developer.

Access to the project site will be provided by a primary entrance, approximately 125 feet north of Lot 2-A-1's southern boundary, as well as a secondary entrance, about 45 feet south of its northern boundary. Pursuant to County standards the project's southern driveway will be located approximately 500 feet from the proposed Waiale Road and Kuikahi Drive intersection.

An all-movement access for the project's primary (southern) driveway and a right-turn in, right-turn out movement for the secondary (northern) driveway are proposed for ingress and

gress. In addition, left-turn storage lanes and applicable intersection improvements are also proposed for implementation.

The proposed traffic improvements will be implemented in connection with the construction of the Waiale Road Extension.

Upon completion, the Waiale Road Extension is anticipated to benefit the community by facilitating access to the project site and improving traffic circulation in the Wailuku area.

2. Water

The anticipated water demand for the proposed affordable rental housing facility is estimated at 560 gallons per unit per day. With a total of 200 units, the total projected water demand for the facility is estimated at 112,000 gallons per day (gpd). Water storage for the project will be provided by the recently completed 3.0 MG Iao Reservoir which serves the Wailuku high level service area. Refer to Appendix C.

The existing 12-inch waterline on Waiale Road terminates at the entrance to MECC's Homeless Resource Center. To implement development, a new 12-inch line is proposed to extend approximately 600 feet south to the project site. In order to provide the necessary fire flow, a 12-inch line is proposed for the project's distribution system. The proposed project will also utilize applicable xeriscape principles and water conservation techniques for landscaping and irrigation.

The proposed project is not anticipated to have an adverse effect on water sources, storage facilities, and distribution and transmission systems.

3. **Wastewater**

Based on 300 gallons per unit each day, the proposed affordable rental housing facility is anticipated to generate approximately 60,000 gpd of wastewater. Refer to Appendix C.

The DPWWM has recently confirmed that the existing 8-inch sewerline on Waiale Road fronting the project site has the capacity to accommodate the wastewater flows generated by the proposed project.

Since the elevation of the project site is lower than the existing gravity line on Waiale Road, a sewer pump station is proposed for installation at a low point along the parcel's eastern boundary. Wastewater generated by the project will be directed into the pump station by a gravity collection system and pumped into the existing gravity line on Waiale Road via a force main.

As previously indicated, the capacity of the Wailuku-Kahului Wastewater Reclamation Facility was recently expanded from 6.0 mgd to 7.9 mgd. The proposed project is not anticipated to have an adverse impact upon the region's wastewater capacities and facilities.

4. **Drainage and Erosion Control**

Site work for the proposed improvements will involve clearing and grubbing, as well as excavating, filling, and grading activities. It

should be noted that grading activities are proposed to be implemented in one (1) phase. Upon completion of grading, all exposed areas will be grassed as required and a solid waste management plan will be prepared for the disposal of solid waste materials. To minimize soil erosion during construction, the erosion control measures reflected in Appendix C will be implemented during site development.

Currently, there are no drainage system improvements which serve the project site. Based on a 10-year storm recurrence interval, approximately 17.8 cfs of on-site surface runoff is presently generated by the project site. Project generated runoff presently sheet flows in a south to north direction across the project site.

The post-development on-site runoff volume generated by the project is estimated to be approximately 40.9 cfs. As a result of the proposed development, a net increase of approximately 23.1 cfs is anticipated.

To intercept on-site runoff volume, proposed drainage system improvements include the installation of catch basins in parking lots and internal roadways. The intercepted runoff will then be conveyed by an underground drainage system and stored in a new underground subsurface retention system. The proposed retention system will be sized to accommodate the incremental increase in runoff, while pre-development runoff will maintain existing drainage patterns and continue to sheet flow off the project site.

The proposed improvements are not anticipated to have an adverse effect on downstream or adjoining properties.

5. **Electrical and Communication Services**

Electrical and communication cables are proposed to be extended overhead from the existing overhead transmission system along Waiale Road into the project site.

The proposed project is not anticipated to adversely impact electrical and telephone services in the Wailuku-Kahului region.

Chapter IV

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

IV. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Pursuant to Chapter 205A, HRS, all lands in the State have been divided and placed into one (1) of four (4) land use districts by the State Land Use Commission. These land use districts have been designated "Urban", "Rural", "Agriculture", and "Conservation". The project site is designated "Urban"; as such, the development of the project site for affordable low-income rental housing and park improvements is compatible with, and permitted within, the State "Urban" land use district. See Figure 7.

B. HAWAII STATE PLAN

Chapter 226, HRS, also known as the Hawaii State Plan, is a long-range comprehensive plan which serves as a guide for the future long-range development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. As reflected by Section 226-19, HRS, the plan outlines objectives and policies with regard to socio-cultural advancement and housing.

More specifically, the stated objectives include the development of residential areas sensitive to community needs and the opportunity for families and individuals to secure reasonably priced housing that satisfactorily accommodates their needs. As indicated by the plan, it is the policy of the State to increase rental opportunities, effectively accommodate housing needs, facilitate the use of available, undeveloped urban lands for housing, and stimulate and promote feasible alternatives that increase housing opportunities for low-income households.

In addition, Section 226-23 outlines objectives and policies with regard to socio-cultural advancement and leisure. As indicated, its principal

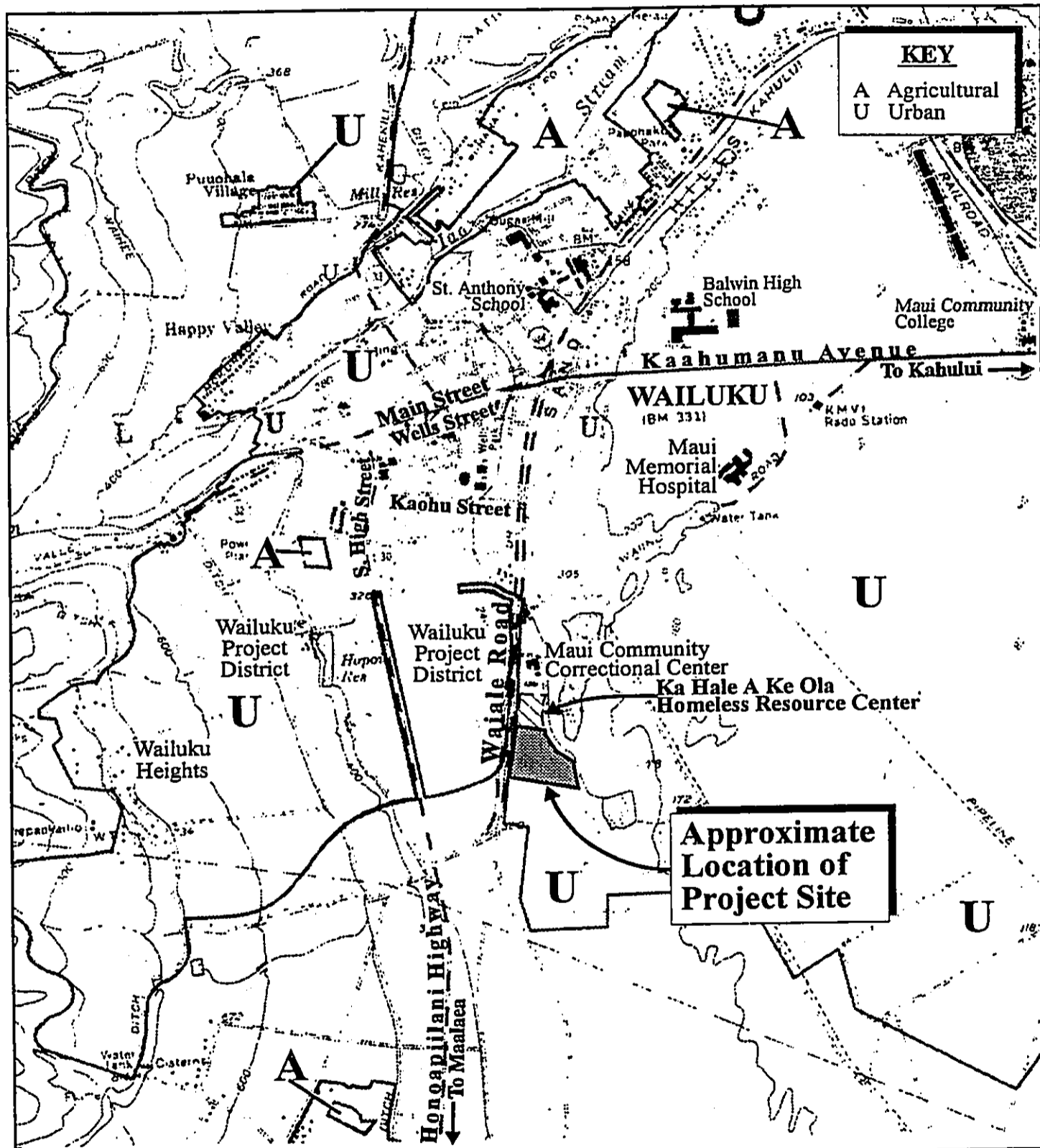


Figure 7 **Waiale Road Affordable Rental Project**
State Land Use District Designations



Prepared for: Maui Economic Concerns of the Community, Inc.

objective is the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations. To achieve this objective, it is the State's policy to provide a wide range of facilities to fulfill recreational needs, as well as assure the availability of resources to provide for future recreational needs.

C. MAUI COUNTY GENERAL PLAN

The 1990 update of the Maui County General Plan establishes broad objectives and policies to guide the long-range development of the County. As indicated by the Maui County Charter, "The purpose of the General Plan is to recognize and state the major problems and opportunities concerning the needs and development of the County and the social, economic, and environmental effects of such development and set forth the desired sequence, patterns, and characteristics of future development".

The proposed project is in keeping with the following General Plan objectives and policies relating to housing and recreation:

Objective: Housing: To provide a choice of attractive, sanitary, and affordable homes for all residents of Maui County.

Recreation: To provide a wide range of recreational and cultural opportunities for all residents of Maui County.

Policies:

- Housing:**
1. Encourage the construction of housing in a variety of price ranges and geographic locations.
 2. Streamline or "fast-track" the governmental review process for affordable single-family and multi-family housing projects.

-
- Recreation:**
1. Encourage the use of public facilities for both cultural and recreational activities.
 2. Support Federal, State, and County initiatives to preserve open space, expand recreational facilities, and provide after school programs for youth.

D. WAILUKU-KAHULUI COMMUNITY PLAN

The project site is located in the Wailuku-Kahului Community Plan region, one (1) of the nine (9) Community Plan regions established in the County of Maui. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns, and characteristics of future development in the region.

Land use guidelines are established by the Wailuku-Kahului Community Plan land use map, and as indicated, the project site is situated within an area designated for Public/Quasi-Public use. See Figure 8.

The proposed project is in keeping with the following recommendations for improving housing and recreational facilities and services reflected in the current Wailuku-Kahului Community Plan:

Housing:

1. Develop a comprehensive housing strategy for low and moderate income groups which will involve government and private industry cooperation.
2. Provide sufficient land areas for new residential growth which relax constraints on the housing market and afford variety in type, price, and location of units.
3. Seek alternative residential growth areas within the planning region, with high priority given to the Wailuku area.

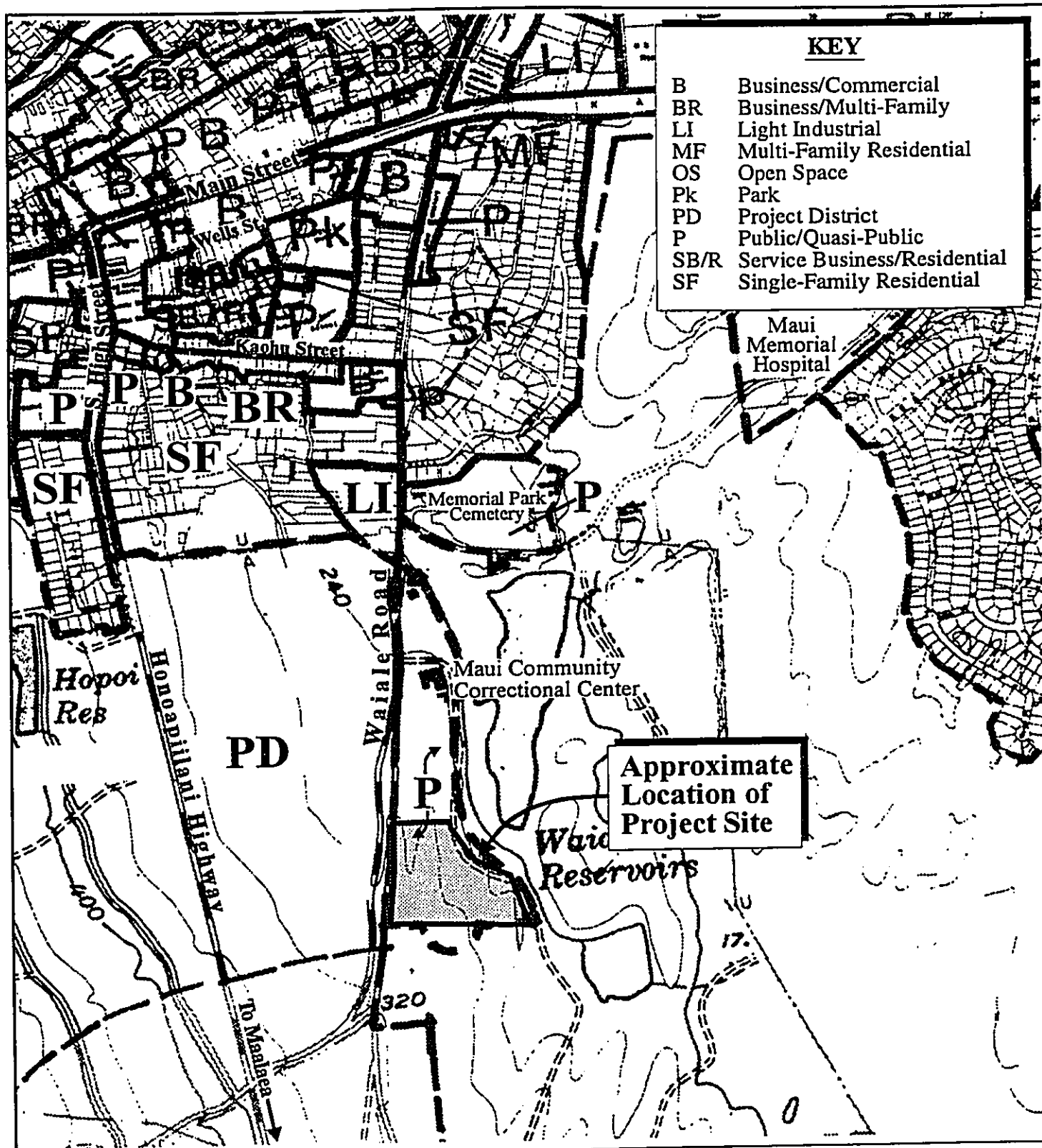


Figure 8

Waiale Road Affordable
Rental Project
Wailuku-Kahului Community
Plan Land Use Map



Prepared for: Maui Economic Concerns of the Community, Inc.

-
4. Develop procedures and regulations to streamline government review and approval for housing projects.

Recreation:

1. Maintain lands acquired or designated for recreational purposes for those uses exclusively.

E. MAUI COUNTY ZONING

The project site is presently designated Interim. According to the Maui County Code, the Interim Zoning District is a temporary zoning district and is not considered an appropriate zoning designation. Properties zoned as such are required to obtain proper zoning prior to development. Pursuant to Section 201E-210, an exemption from provisions of the Interim Zoning District to permit development in accordance with the standards established for the A-1, Apartment District and additional accessory uses is being requested.

Chapter V

***Summary of Unavoidable, Adverse
Environmental Effects; Alternatives
to the Proposed Action; and the
Irreversible and Irretrievable
Commitment of Resources***

V. SUMMARY OF UNAVOIDABLE, ADVERSE ENVIRONMENTAL EFFECTS; ALTERNATIVES TO THE PROPOSED ACTION; AND THE IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A. UNAVOIDABLE, ADVERSE ENVIRONMENTAL EFFECTS

The proposed project will result in some construction-related impacts as described in Chapter III, Potential Impacts and Mitigation Measures.

Potential effects include noise-generated impacts occurring from site preparation and construction activities. In addition, there may be temporary air quality impacts associated with dust generated from construction activities, and exhaust emissions discharged by construction equipment.

The proposed project is not anticipated to create any significant, long-term, adverse environmental effects.

B. ALTERNATIVES TO THE PROPOSED ACTION

1. No Action Alternative

In light of the established need for affordable low-income rental housing and recreational facilities in the Central Maui region, the "no action" alternative does not represent a responsible option. The proposed project will provide much needed affordable rental housing for low-income families and individuals in the Wailuku-Kahului region, as well as graduates of MECC's Homeless Resource Center transitional housing program. In addition, the proposed design and development of the future park facility will address and accommodate the recreational needs of local residents and the community.

2. **Deferred Action Alternative**

A "deferred action" alternative will have similar consequences as a "no action" alternative in that problems relating to the lack of affordable rental housing and the development of recreational facilities will still persist. Deferring the development of the proposed improvements could result in higher implementation costs resulting from potential labor and material increases.

3. **Alternative Site**

The land underlying the project site is owned by the County of Maui. MECC and the County are currently negotiating a 55-year lease for the project site.

The project site provides a convenient location and close proximity to government agencies, social services, and commercial establishments. MECC's adjoining Homeless Resource Center also offers medical, as well as child day care services. In addition, recreational opportunities for Maui residents and the surrounding community will also be enhanced with the development of the future park facility.

Currently, there are no unprogrammed County-owned sites that can offer a comparable location and proximity to community resources, as well as recreational facilities.

C. **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

The proposed project would involve the commitment of fuel, labor, and material resources, as well as public and private funds.

Development of the proposed project will also involve the commitment of land for improvements which would preclude other land use options for the site. This commitment is consistent with existing and future land uses surrounding the project site.

Chapter VI

Findings and Conclusions

VI. FINDINGS AND CONCLUSIONS

The proposed project will involve the development of an affordable rental housing facility and related improvements, as well as the design and preparation of plans, specifications, and estimates for the development of an adjoining County park facility. The proposed affordable rental housing facility will consist of 200 unfurnished apartment units, a community center, a manager's unit and office, as well as laundry, storage, and maintenance buildings. In addition to related parking, drainage, and landscaping improvements, a privately operated sewer pump station is also proposed. Future park improvements will include a sports field, passive recreational area, and parking and restroom facilities.

The County of Maui's fiscal year 1995 Consolidated Plan has identified the production of affordable rental housing units for families of five (5) or more persons as a priority housing need. It should be noted that between January 31, 1991 to January 31, 1995, approximately 2,000 Maui County families have been placed on the waiting list for rental housing assistance.

With regard to this acknowledged need, the proposed project will complete a system of vertical integration of services and assist graduates of the Homeless Center's transitional housing program, as well as other families and individuals, to move from a state of dependency and homelessness to self-sufficiency and affordable, long-term housing.

Currently, there are no recreational facilities located within the immediate vicinity of the project site. As such, the proposed design and development of the future park facility is anticipated to address and accommodate, the recreational needs of Maui residents and the surrounding community.

Construction of the proposed project will involve short-term environmental effects typically associated with construction activities. To mitigate air quality and noise

impacts, construction activities will be limited to daylight hours. Appropriate dust control measures such as sprinkling, watering, and revegetation, will be undertaken to minimize fugitive dust. Although ambient noise conditions may be temporarily affected by construction activities, no significant adverse effects are anticipated.

From a long-term perspective, the proposed project is not anticipated to result in any adverse environmental impacts. There are no rare, endangered or threatened species of flora and fauna within the project site. An archaeological inventory survey of the project site did not yield any significant cultural artifacts or remains. Should any artifacts or remains be encountered, construction activities in the immediate area will be halted and the State Historic Preservation Division (SHPD) will be notified. The project site is not part of a scenic corridor and the proposed improvements are not anticipated to have an adverse impact upon the visual character of the surrounding area.

With regard to short-term socio-economic impacts, construction-related employment is anticipated to have a positive effect on the local economy. In addition, the proposed project is anticipated to fulfill an immediate and significant need in the community for affordable rental housing and the development of recreational facilities.

On a long-term basis, the proposed development is not anticipated to have any adverse impacts upon public services or infrastructure systems. Applicable water, sewer, and drainage system improvements will be implemented for the development of the project. Adjoining roadway improvements will be undertaken by the County and facilitate access to the project site as well as improve regional traffic circulation. The proposed project will also benefit the community by providing long-term affordable housing for low-income families and individuals earning no more than 50 percent of the Maui County median family income. In

addition, the development of the future park facility will expand the existing network of County recreational facilities as well provide additional recreational opportunities for the community.

Based on an assessment of the proposed project, the development of the Waiale Road Affordable Rental Project will not result in any significant environmental impacts.

Chapter VII

***Agencies Consulted During
the Preparation of the
Environmental Assessment***

**VII. AGENCIES CONSULTED DURING THE PREPARATION OF
THE ENVIRONMENTAL ASSESSMENT**

1. County of Maui
Department of Housing
and Human Concerns
200 South High Street
Wailuku, Hawaii 96793
2. County of Maui
Department of Parks
and Recreation
200 South High Street
Wailuku, Hawaii 96793
3. County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793
4. County of Maui
Department of Public Works
and Waste Management
200 South High Street
Wailuku, Hawaii 96793
5. County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793
6. County of Maui
Office of the Mayor
200 South High Street
Wailuku, Hawaii 96793
7. State of Hawaii
Department of Health
54 High Street
Wailuku, Hawaii 96793
8. U.S. Department of Fish
and Wildlife Service
P. O. Box 50167
Honolulu, Hawaii 96850

References

References

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- Michael T. Munekiyo Consulting, Inc., Wailuku Project District No. 3 - Project District Development Approval Application (Phase II), December 1991.
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- Munekiyo & Arakawa, Inc., Maunaloa Village - Application for Housing Development Pursuant to Chapter 201E-210, Hawaii Revised Statutes, July 20, 1994.
- Munekiyo & Arakawa, Inc., Final Environmental Assessment - Aircraft Rescue and Fire Fighting Training Facility at Kahului Airport, April 1995.
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Telephone conversation with Department of Housing and Human Concerns employees, Milton Ito and Wayde Oshiro, July 1995.

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DOCUMENT CAPTURED AS RECEIVED

Appendices

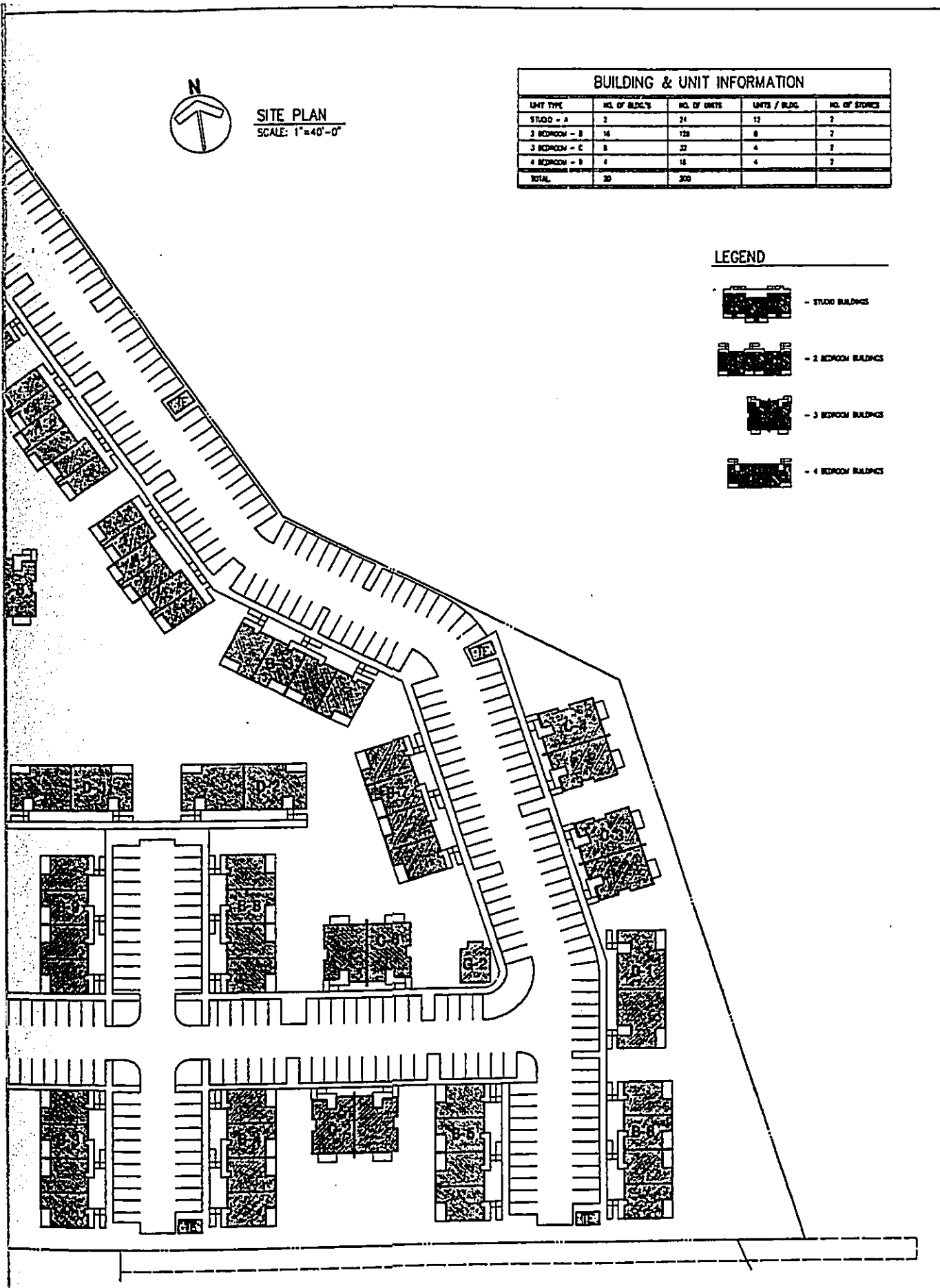


SITE PLAN
SCALE: 1"=40'-0"

BUILDING & UNIT INFORMATION				
UNIT TYPE	NO. OF BLDGS	NO. OF UNITS	UNITS / BLDG	NO. OF STORIES
STUDIO - A	2	24	12	2
2 BEDROOM - B	16	128	8	2
3 BEDROOM - C	8	24	3	2
4 BEDROOM - D	4	16	4	2
TOTAL	30	300		

LEGEND

- STUDIO BUILDINGS
- 2 BEDROOM BUILDINGS
- 3 BEDROOM BUILDINGS
- 4 BEDROOM BUILDINGS



SCALE 1"



GYA ARCHITECTS, INC.
A DESIGN CORPORATION

4418
Wala Street Professional Center
Suite 303
2145 Wala Street
Waipuku, Maui, Hawaii 96793
Phone (808) 242-4444
Fax (808) 242-4475
4144
Bank of America Building
Suite 1230
1337 Keolu Road
Honolulu, Hawaii 96814
Phone (808) 855-3008
Fax (808) 855-2005

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII

TMK: 3-8-48:21

SITE PLAN

NOTICE
This plan was prepared by me or under my supervision and I am a duly licensed professional engineer in the State of Hawaii. I am not providing any warranty or representation of any kind for the use of this plan for any purpose other than that for which it was prepared.

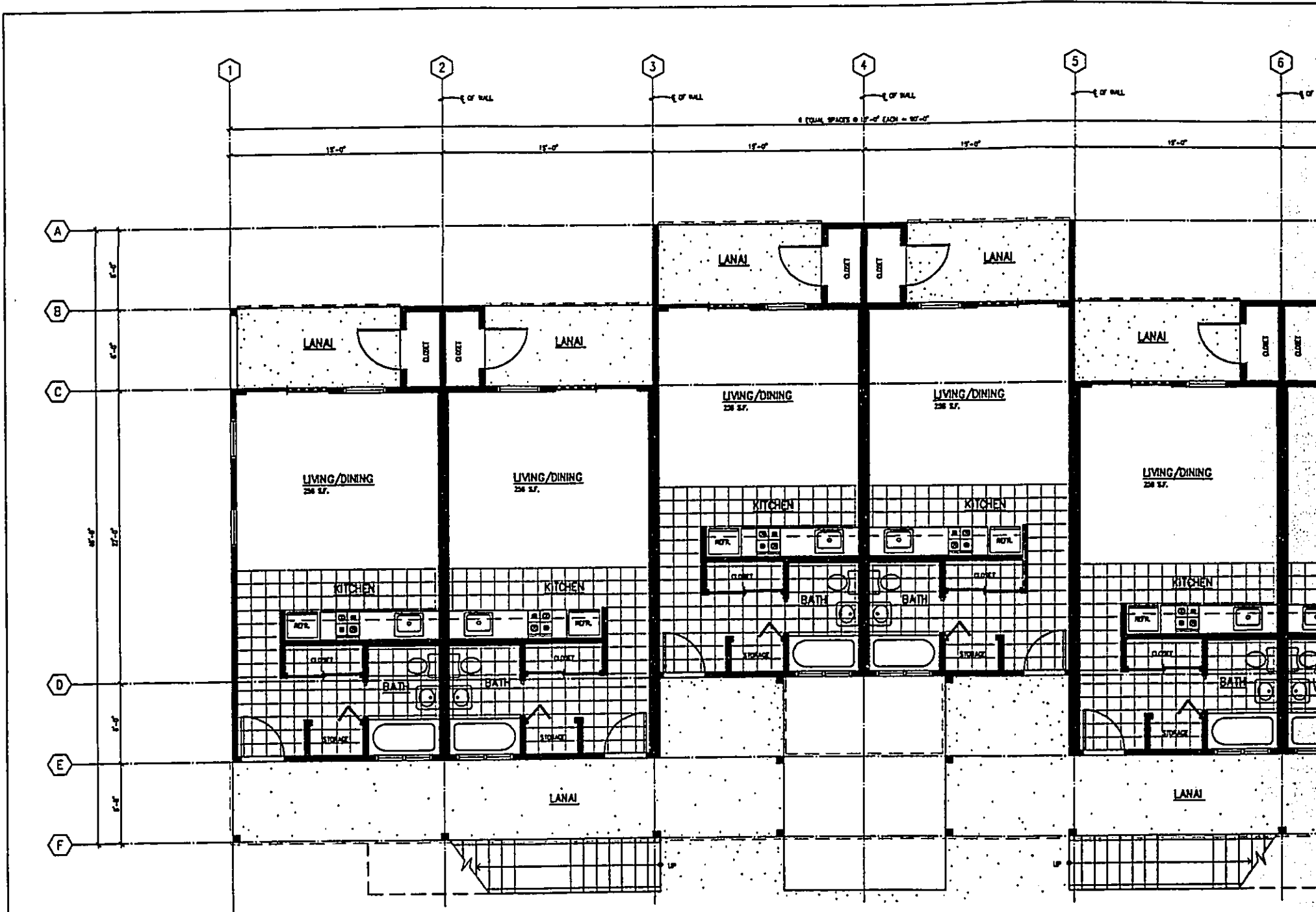
DESIGNER
I, the Designer, shall stand and rely on the accuracy of the data provided and the information furnished to me.

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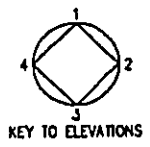
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Drawn by: **DM**
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Date: **6-30-05**
Sheet No.:

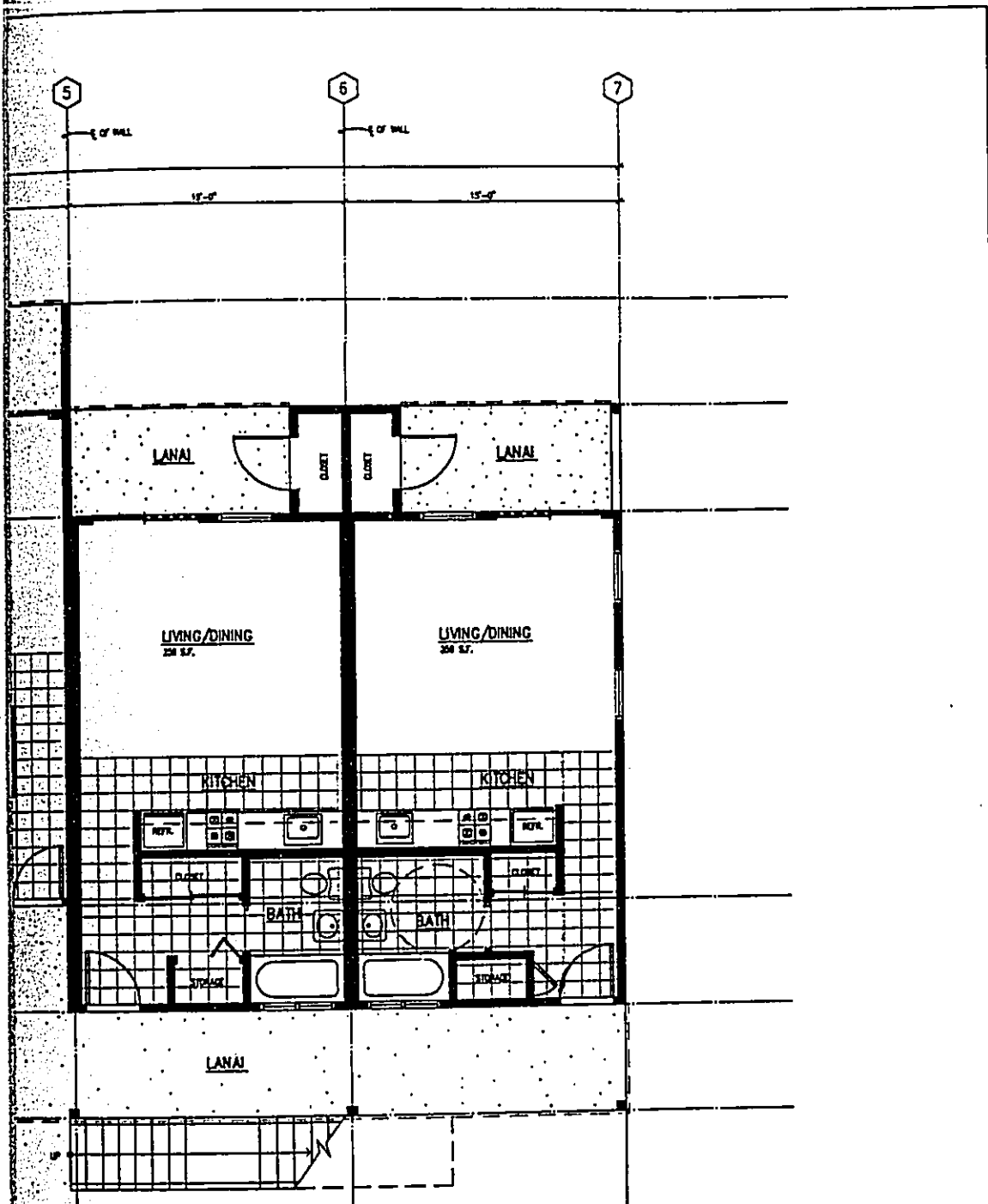
SK-1

of sheets



BUILDING 'A' - FIRST FLOOR PLAN
 SCALE: 1/4"=1'-0"
 (STUDIO UNITS)





AREA CALCULATIONS

420 SF	LIVING AREA
90 SF	LANAI & CLOSET
510 SF	GROSS UNIT AREA
X 12	TOTAL UNITS (BLDG. 'A')
6,120 SF	TOTAL GROSS UNIT AREA



GYA ARCHITECTS INC.
A DESIGN CORPORATION

1416
1416 Street Professional Center
Suite 303
2145 Vaila Street
Honolulu, Hawaii 96813
Phone (808) 241-4444
Fax (808) 241-4475
1416
Bank of America Building
Suite 1230
1337 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 955-3000
Fax (808) 955-2000

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII
TASK: 3-8-48:21

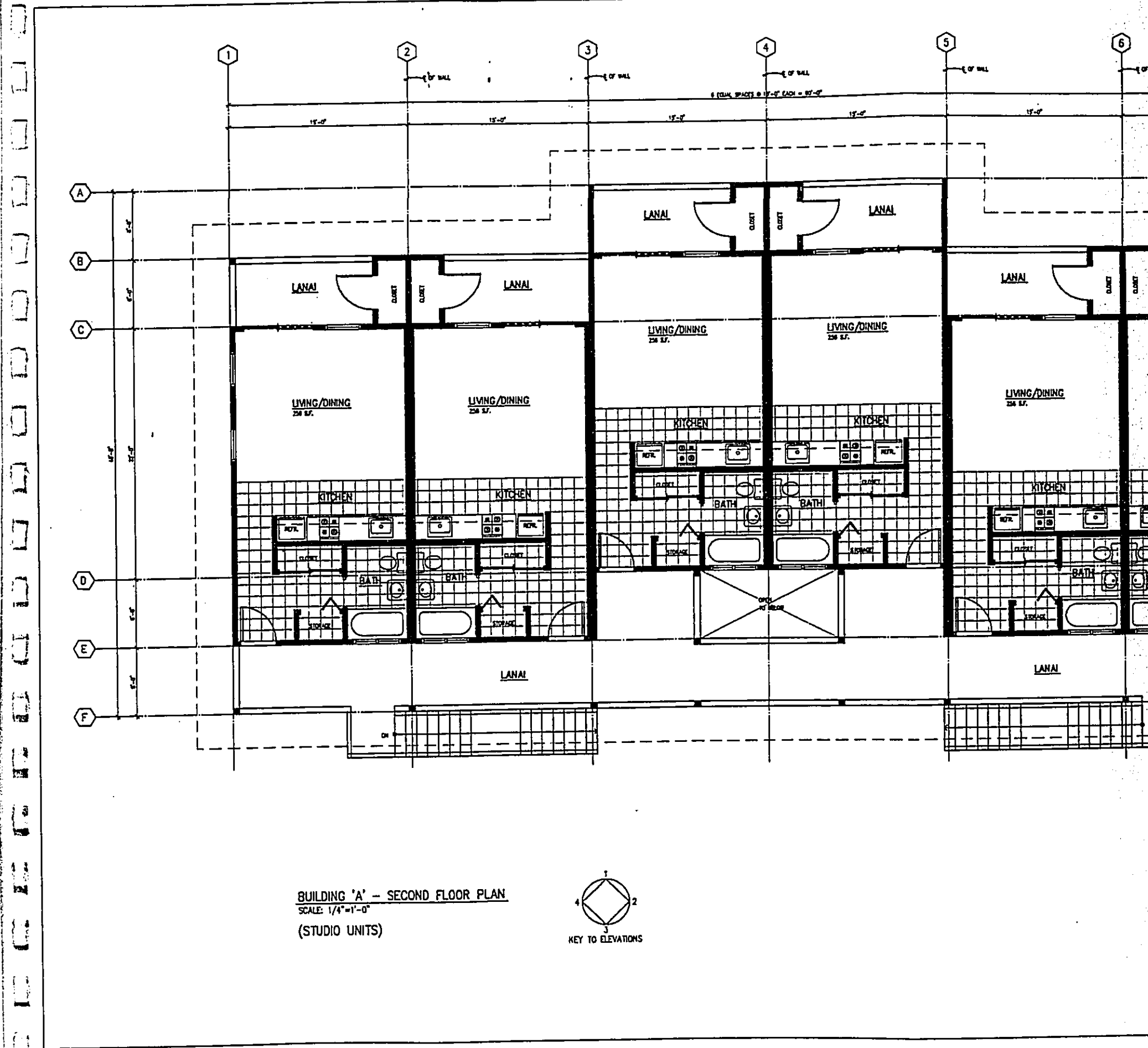
FIRST FLOOR PLAN

This work was prepared by me or under my direct supervision and I am a duly licensed professional architect in the State of Hawaii. I am not providing any professional services in any other jurisdiction. I am not providing any professional services in any other jurisdiction. I am not providing any professional services in any other jurisdiction.

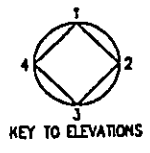
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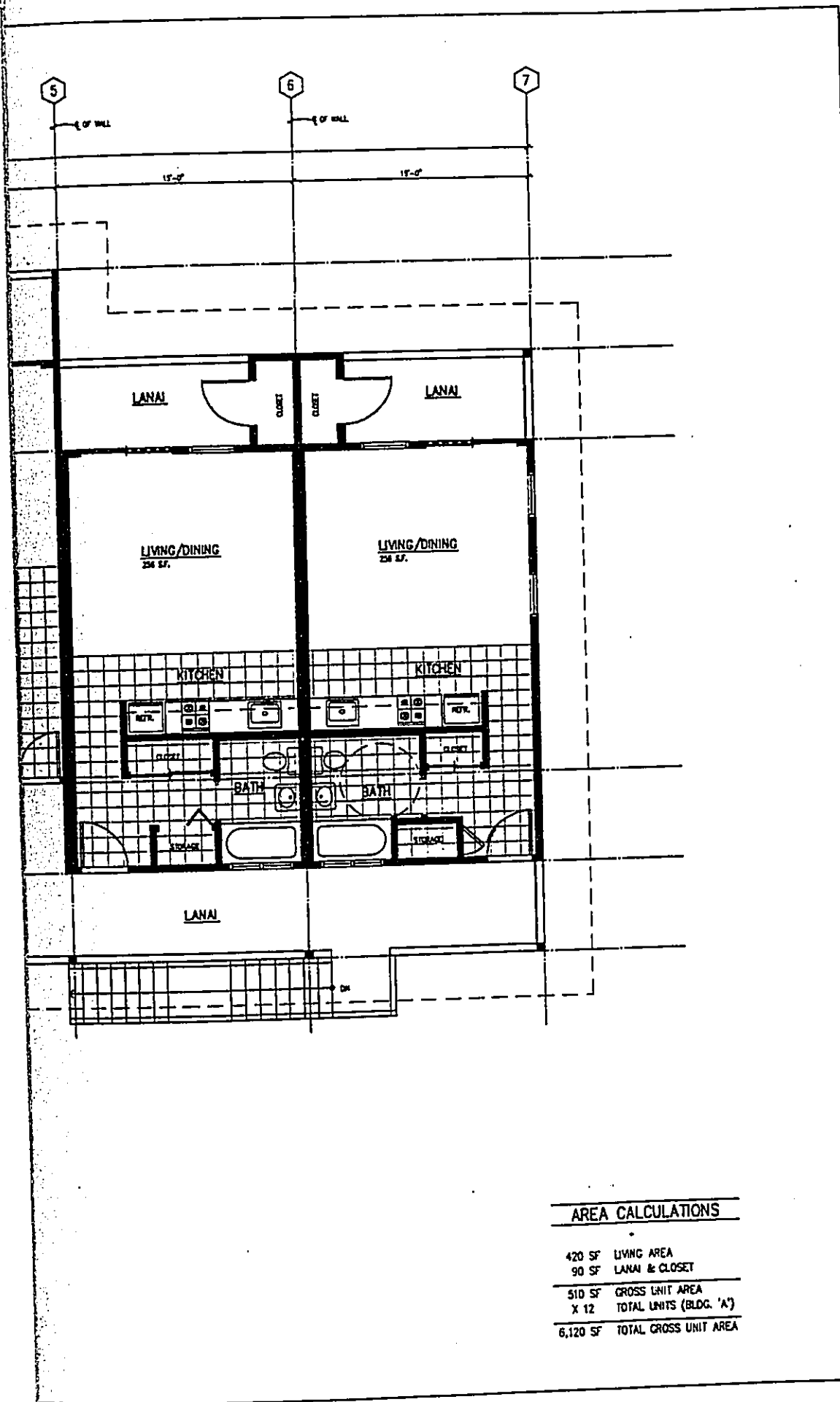
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Drawn by: CH
Proj. No.: 04173
Date: 6-20-88
Sheet No.:

SK-2



BUILDING 'A' - SECOND FLOOR PLAN
 SCALE: 1/4"=1'-0"
 (STUDIO UNITS)





GYA ARCHITECTS INC.
A DESIGN CORPORATION

MAIL
Waialeale Professional Center
Suite 323
2145 Waialeale Street
Waialeale, Maui, Hawaii 96783
Phone (808) 242-8888
Fax (808) 242-4875

GAAR
Bank of America Building
Suite 1230
1337 Kapalani Boulevard
Honolulu, Hawaii 96816
Phone (808) 955-3000
Fax (808) 955-2005

WAIALE AFFORDABLE HOUSING

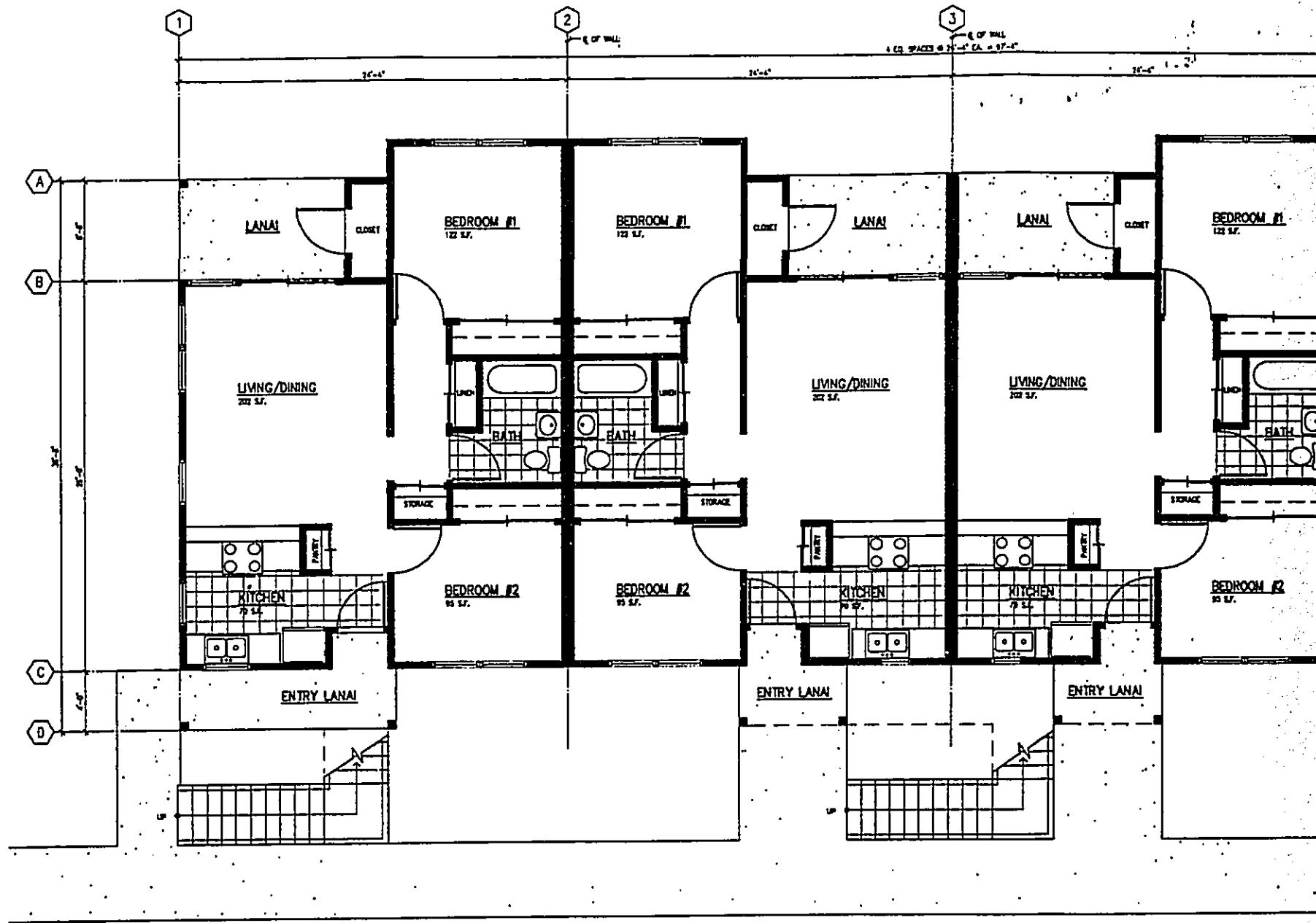
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TMK: 3-8-48:21

SECOND FLOOR PLAN

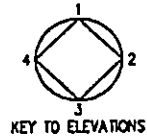
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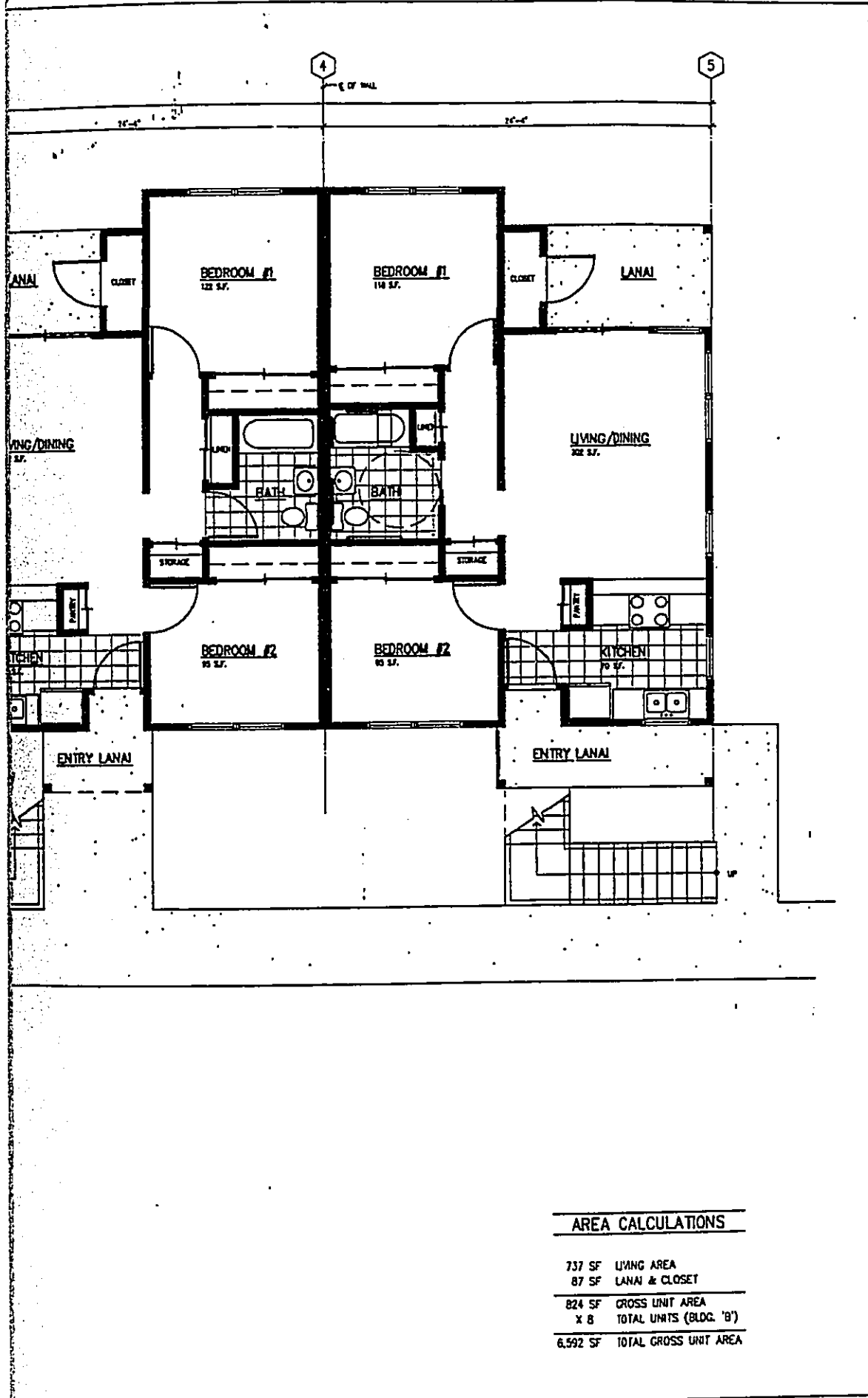
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Drawn by: GY
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Date: 8-28-08
Sheet No.:

SK-3



BUILDING 'B' - FIRST FLOOR PLAN
 SCALE: 1/4" = 1'-0"
 (TWO BEDROOM UNITS)





GVA ARCHITECTS, INC.
A DESIGN CORPORATION

MAE
Wala Street Professional Center
Suite 303
2145 Wala Street
Honolulu, Hawaii 96813
Phone (808) 242-4466
Fax (808) 242-4673

KAHA
Bank of America Building
Suite 1220
1537 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 809-3008
Fax (808) 809-2008

WAIKALE AFFORDABLE HOUSING

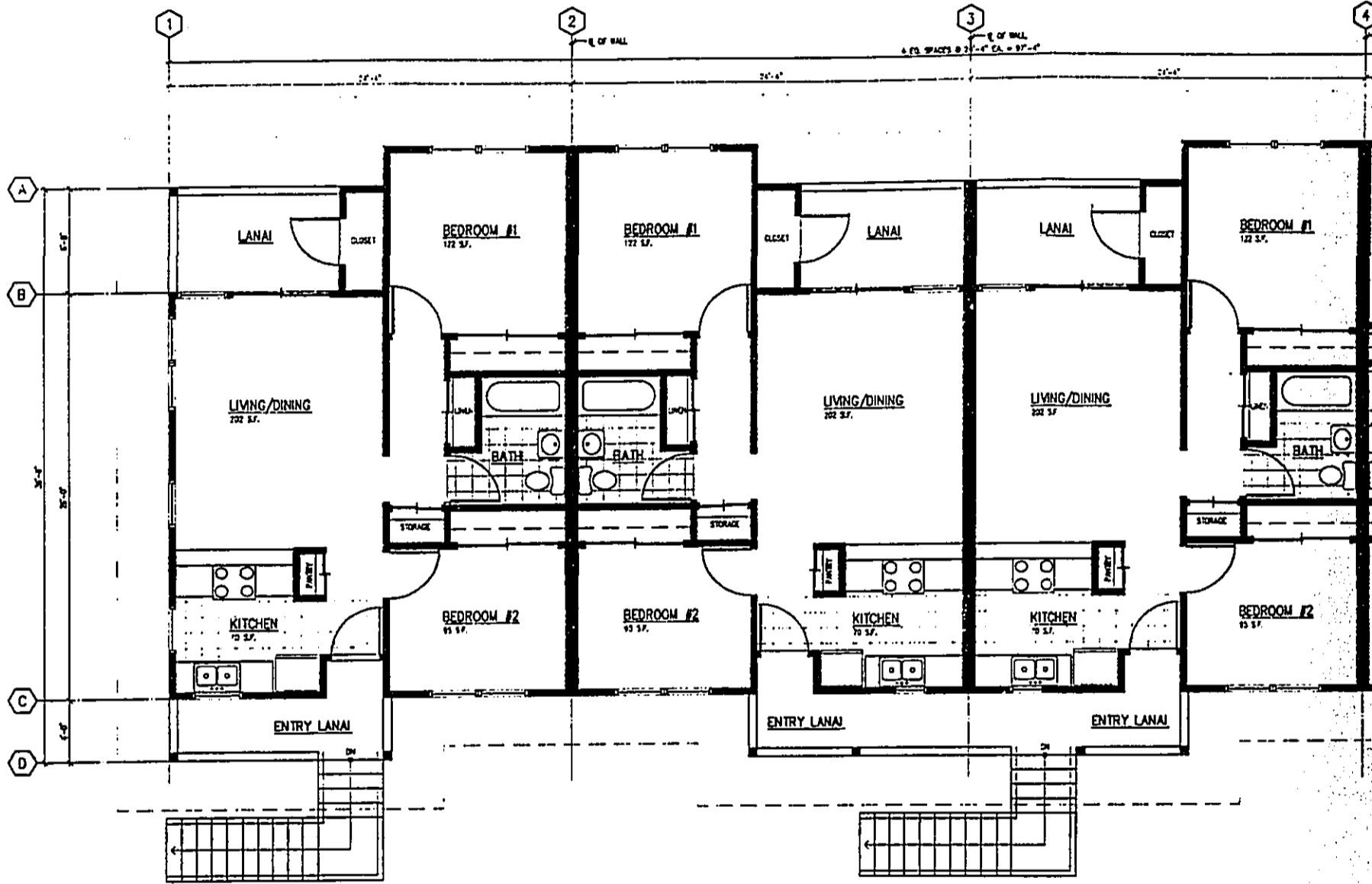
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TEL: 3-8-48:21

FIRST FLOOR PLAN

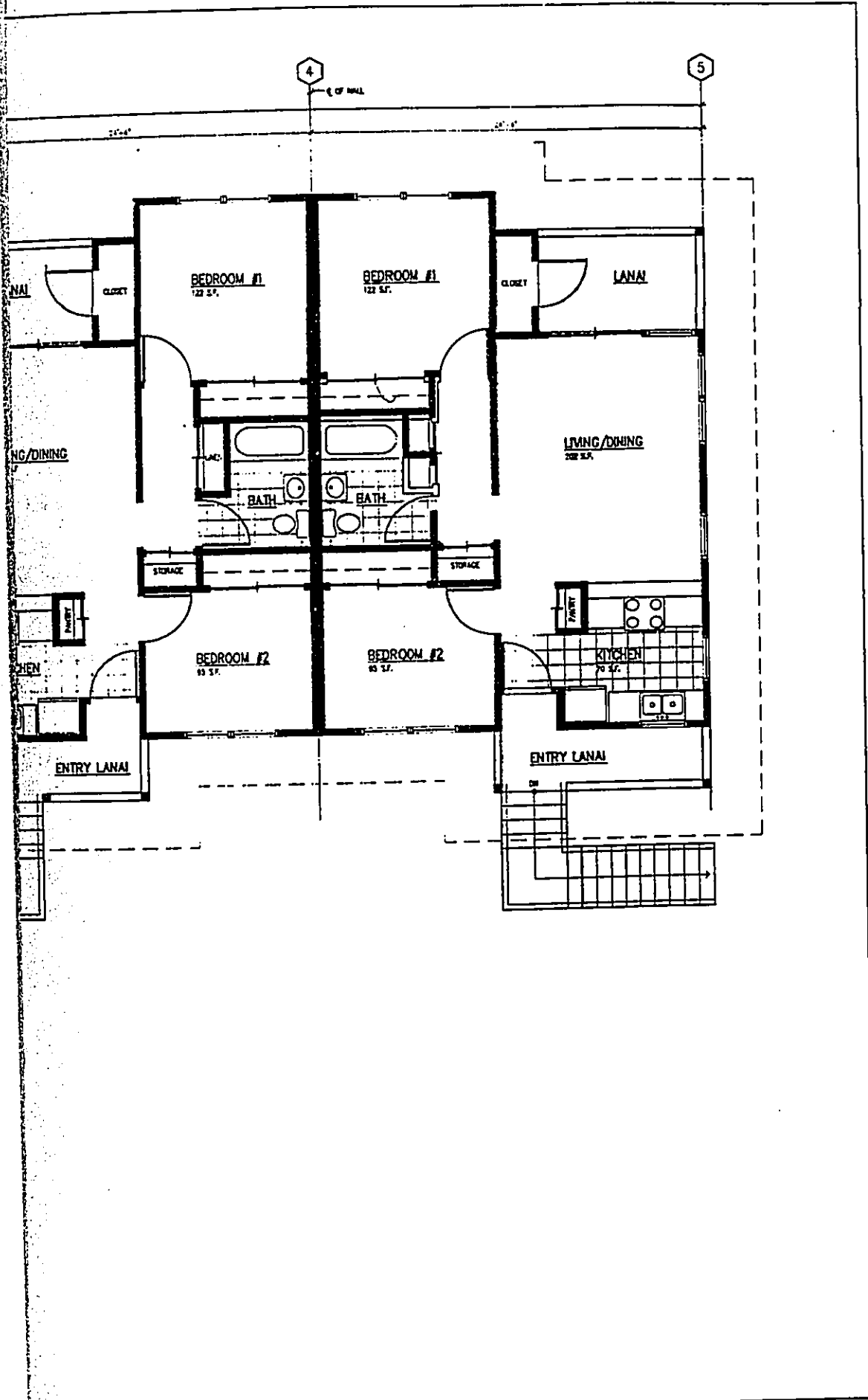
STAMP
This work was prepared for use or used for
construction and construction of the project
and is not to be used for any other purpose
without the written consent of the architect.
Professional Engineer, Architect,
Surveyor, and Landscape Architect

Designed by: RM, CM
Drawn by: GM, GT
Project No.: 04112B
Date: 6-20-88
Sheet No.:

SK-4



BUILDING 'B' - SECOND FLOOR PLAN
 SCALE: 1/4" = 1'-0"
 (TWO BEDROOM UNITS)



GYA ARCHITECTS, INC.
A DESIGN CORPORATION

MAUI
Waie Street Professional Center
Suite 303
2148 Waie Street
Wailea, Maui, Hawaii 96793
Phone (808) 242-4444
Fax (808) 242-4673

DAHU
Bank of America Building
Suite 1230
1157 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 823-3078
Fax (808) 825-2020

WAIWALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII

TMK: 3 - 8 - 48 : 21

SECOND FLOOR PLAN

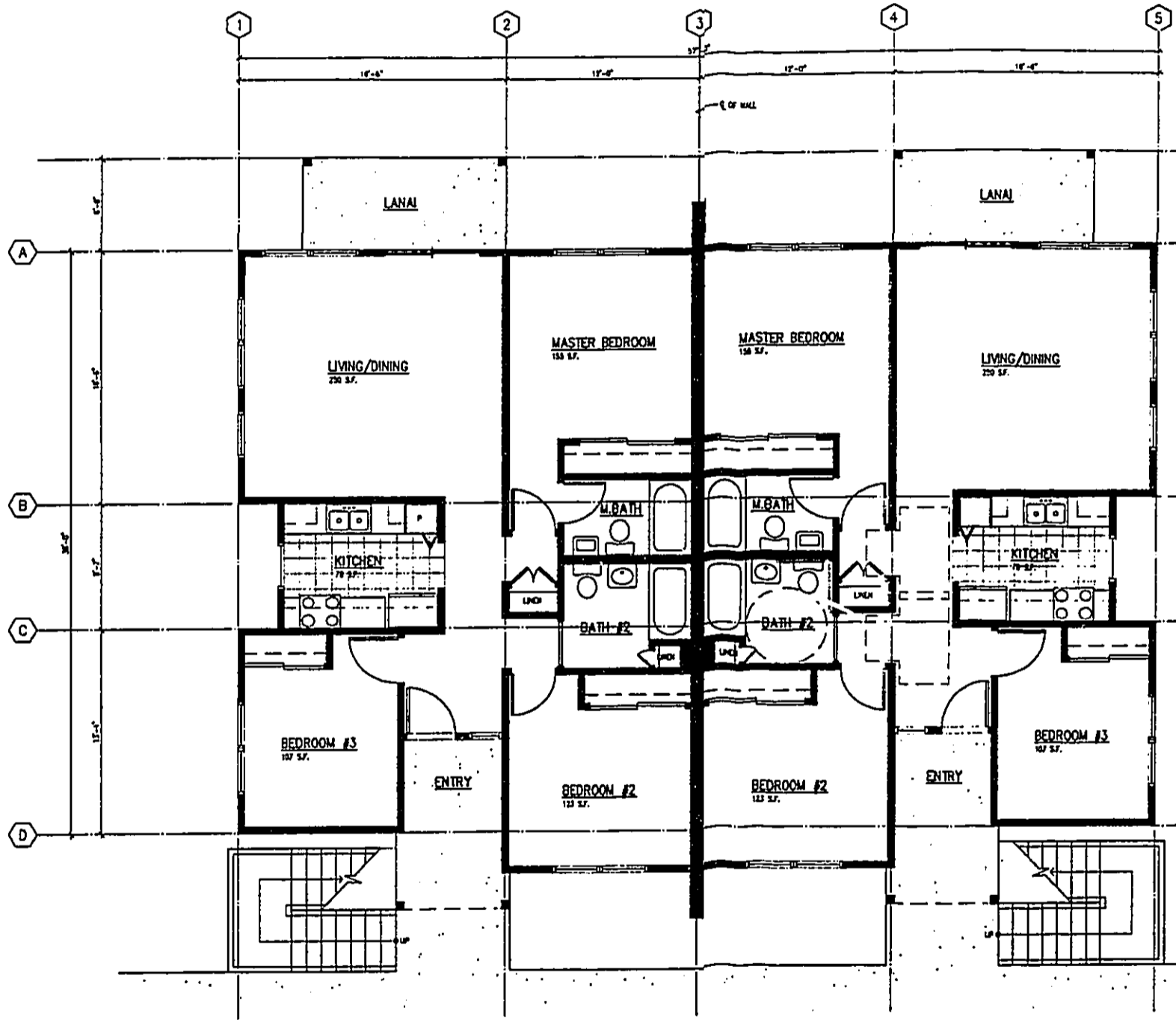
Notes:
1. This plan was prepared by me or under my direct supervision and control, and I am a duly licensed and registered Professional Engineer, Architect, Professional Engineer, or Professional Surveyor and Contractor, as applicable.

2. I am a duly licensed and registered Professional Engineer, Architect, Professional Engineer, or Professional Surveyor and Contractor, as applicable.

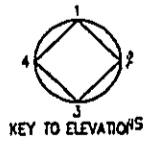
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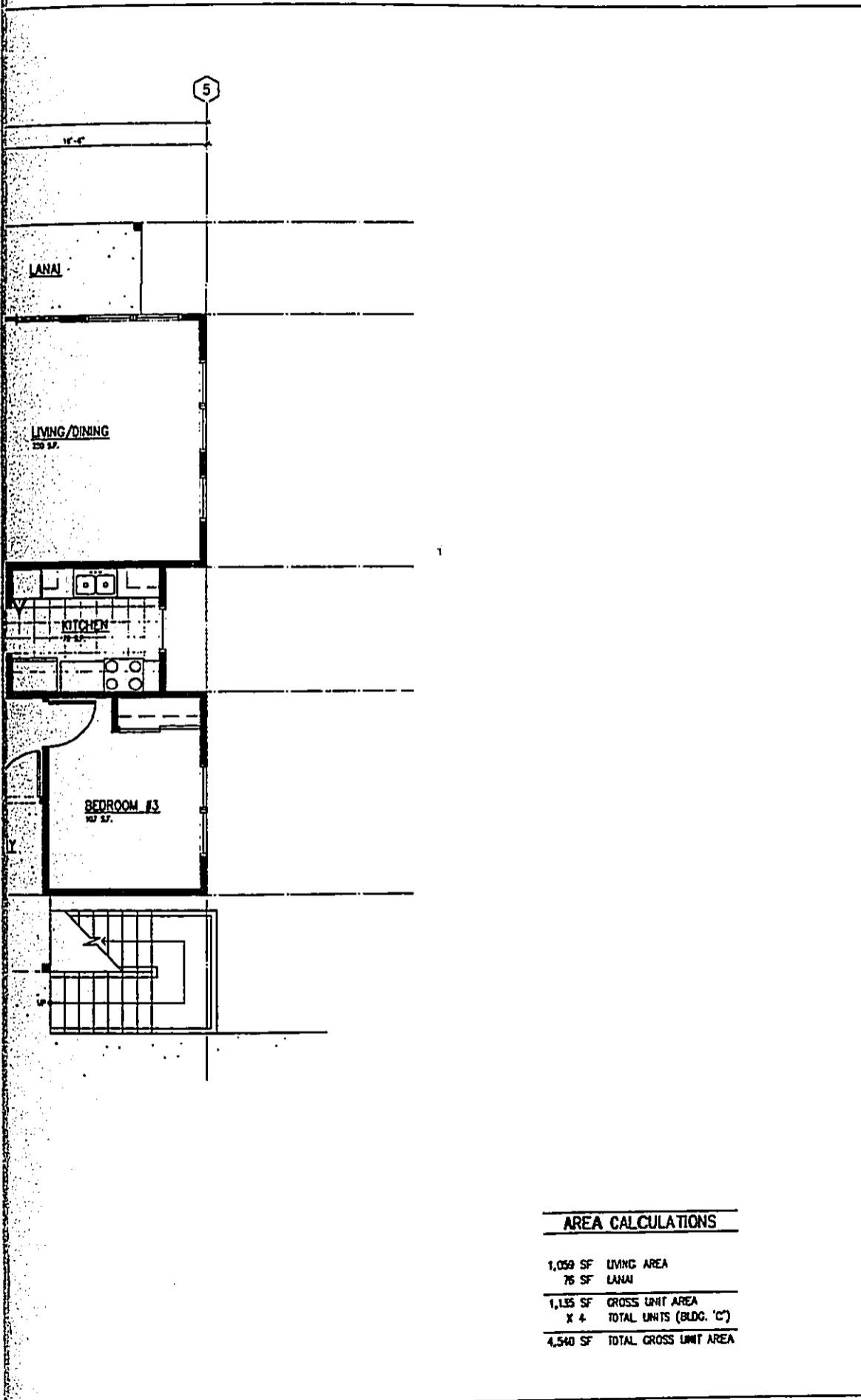
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Drawn by: DM, DT
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Date: 6-20-05
Sheet No.:

SK-5



BUILDING 'C' - FIRST FLOOR PLAN
 SCALE: 1/4"=1'-0"
 (THREE BEDROOM UNITS)





AREA CALCULATIONS

1,059 SF	LIVING AREA
76 SF	LANAI
1,135 SF	GROSS UNIT AREA
X 4	TOTAL UNITS (BLDG. 'C')
4,540 SF	TOTAL GROSS UNIT AREA



GYA ARCHITECTS INC
A DESIGN CORPORATION

HALE
Wale Street Professional Center
Suite 303
2145 Wale Street
Wailuku, Maui, Hawaii 96753
Phone (808) 242-4668
Fax (808) 242-4673

OAHU
Bank of America Building
Suite 1230
1337 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 839-3009
Fax (808) 839-3005

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII
TAK: 3 - 8 - 48 : 21

FIRST FLOOR PLAN

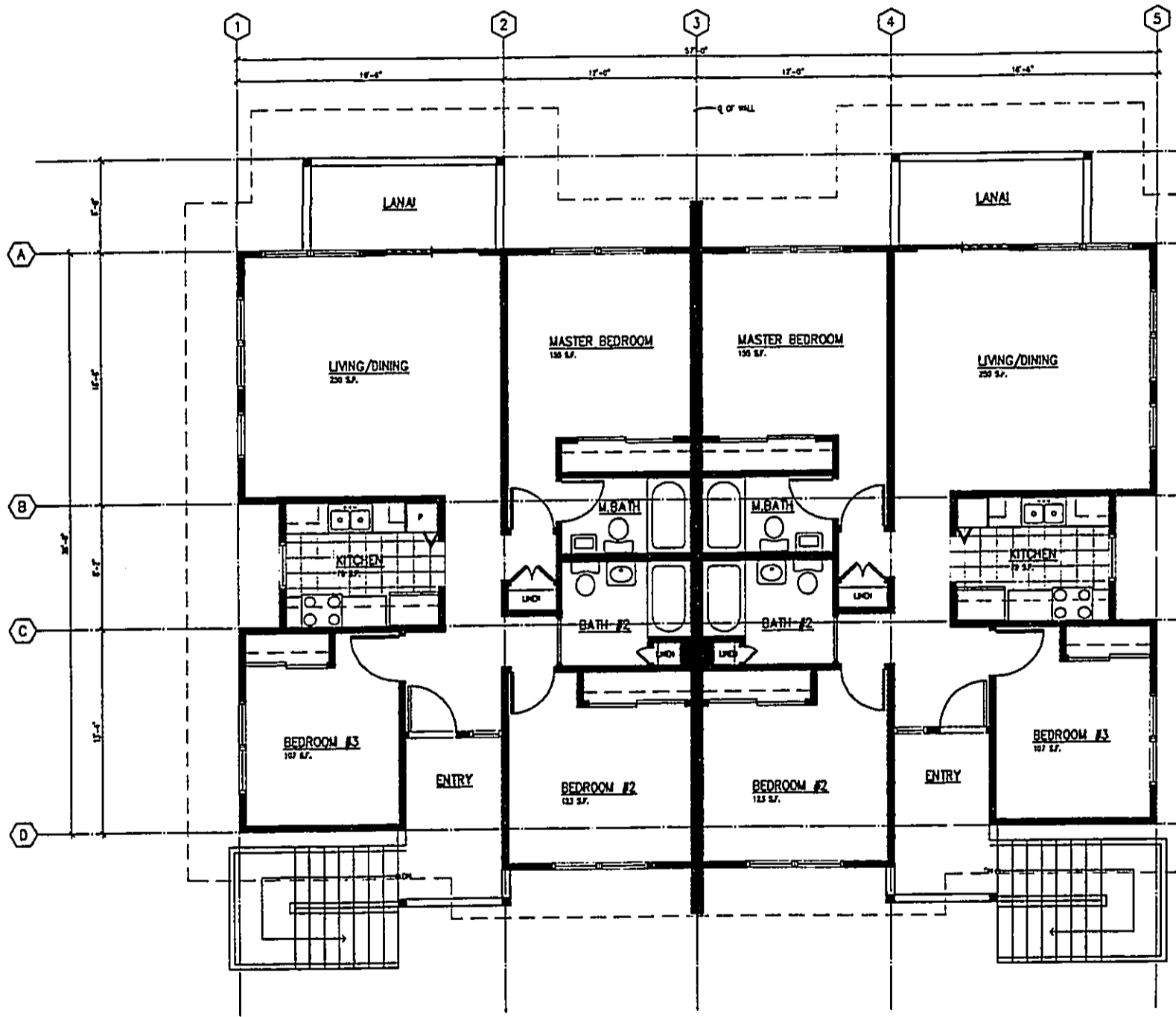
Stamp
This work was prepared by me or under my supervision and I am a duly Licensed Professional Engineer, Architect, Surveyor and Land Surveyor.

Signature
I hereby certify that these plans and specifications are true and correct as shown on the drawings and as approved by me.

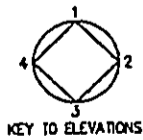
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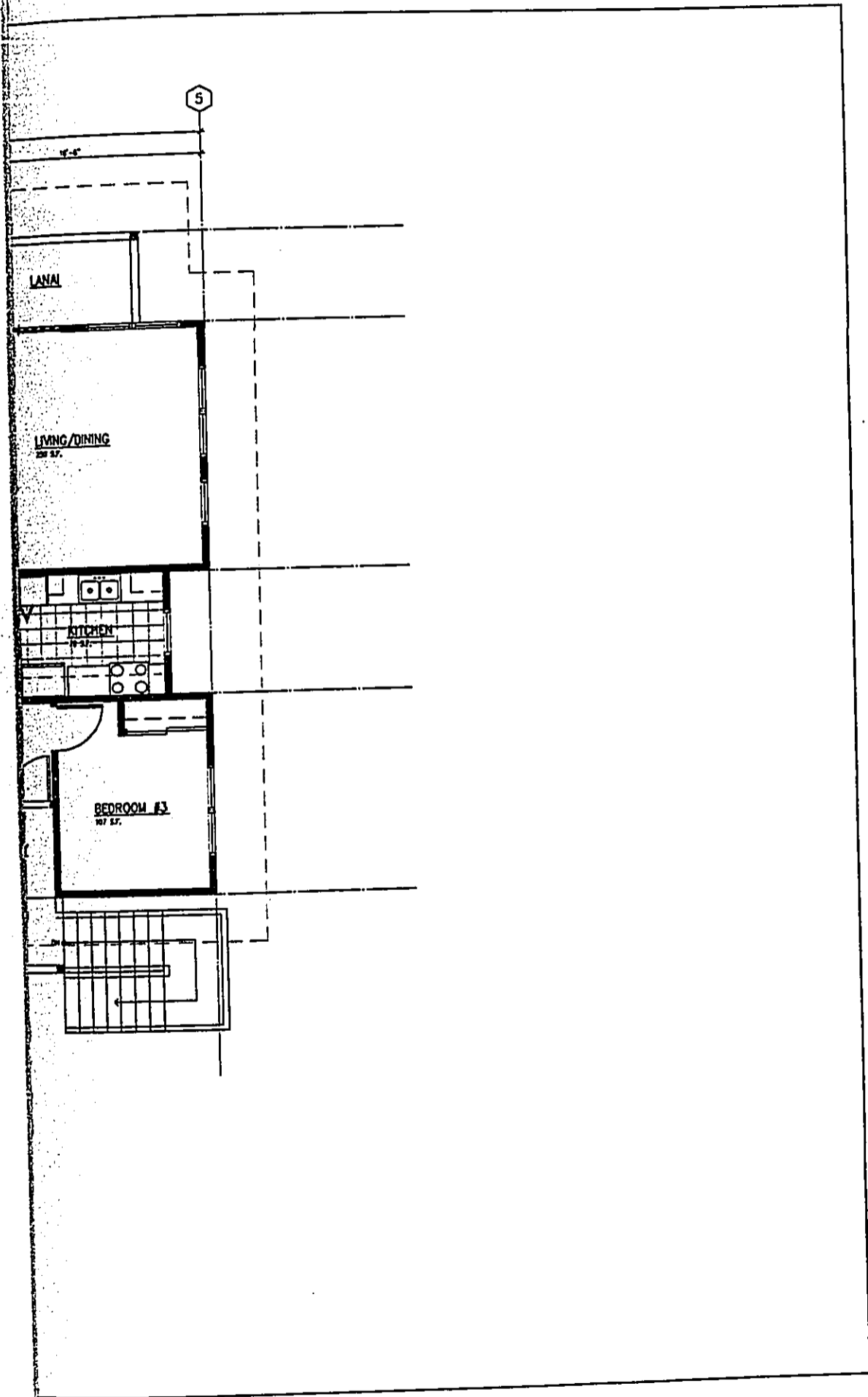
Designed by: **RACN**
Drawn by: **DA**
Project No.: **94912P**
Date: **9-20-85**
Sheet No.:

SK-6



BUILDING 'C' - SECOND FLOOR PLAN
 SCALE: 1/4"=1'-0"
 (THREE BEDROOM UNITS)





GVA ARCHITECTS INC.
 A DESIGN CORPORATION
 1442
 Hale Street Professional Center
 Suite 203
 2145 Hale Street
 Wailea, Maui, Hawaii 96753
 Phone (808) 242-4468
 Fax (808) 242-4873
 0492
 Bank of America Building
 Suite 1230
 1337 Kapalani Boulevard
 Honolulu, Hawaii 96816
 Phone (808) 925-3008
 Fax (808) 925-3003

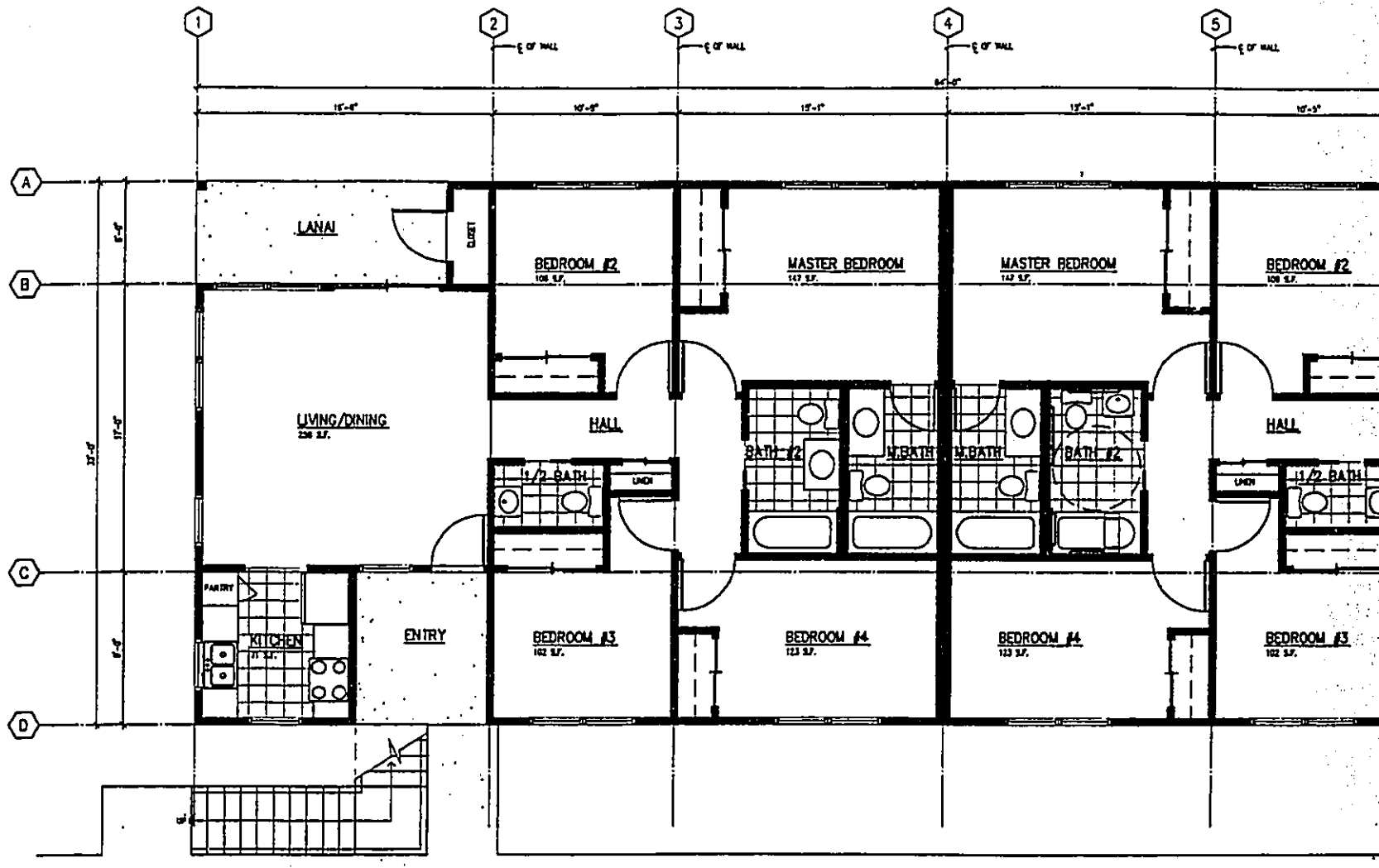
WAIALE AFFORDABLE HOUSING
 WAILUKU, MAUI, HAWAII
 TMK: 8-8-48:21

SECOND FLOOR PLAN

Notes:
 1. See notes on drawings for details of construction.
 2. All dimensions are to the centerline of walls unless otherwise noted.
 3. All doors and windows are to be installed in accordance with the manufacturer's instructions.
 4. All electrical work shall be in accordance with the National Electrical Code (NEC) and all applicable local codes.
 5. All plumbing work shall be in accordance with the Uniform Plumbing Code (UPC) and all applicable local codes.
 6. All mechanical work shall be in accordance with the International Mechanical Code (IMC) and all applicable local codes.
 7. All work shall be completed in accordance with the approved construction documents.
 8. All materials shall be of the highest quality and shall be installed in accordance with the manufacturer's instructions.
 9. All work shall be completed in accordance with the approved construction documents.
 10. All work shall be completed in accordance with the approved construction documents.

Designed by: RAL, CH
 Drawn by: CH, CH
 Project No.: 84171.0
 Date: 8-25-88
 Sheet No.:

SK-7



BUILDING 'D' - FIRST FLOOR PLAN
 SCALE: 1/4"=1'-0"
 (FOUR BEDROOM UNITS)



GVA ARCHITECTS, INC.
A DESIGN CORPORATION

MAUI
Maui Street Professional Center
Suite 303
2140 Maui Street
Wailuku, Maui, Hawaii 96793
Phone (808) 242-4444
Fax (808) 242-4473

OAHU
Bank of America Building
Suite 1230
1337 Kapahulu Boulevard
Honolulu, Hawaii 96814
Phone (808) 935-3008
Fax (808) 935-2008

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII

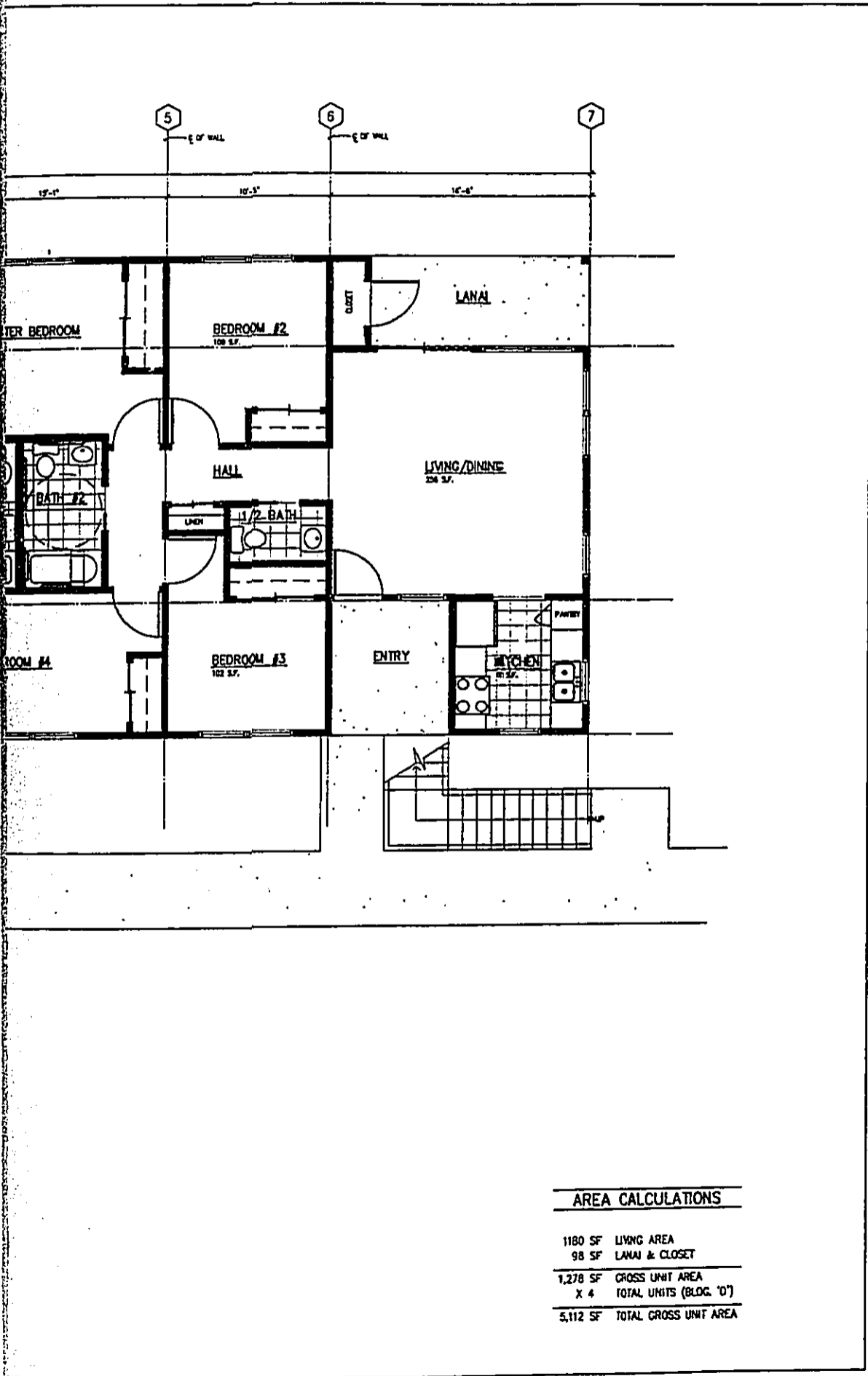
TMK: 3-8-48:21

FIRST FLOOR PLAN

This work was prepared by me or under my direct supervision and I am a duly licensed professional architect in the State of Hawaii. I am not providing this work as an agent for any other person or entity. I am not providing this work as a contractor or subcontractor. I am not providing this work as a consultant or advisor. I am not providing this work as a design professional. I am not providing this work as a design professional. I am not providing this work as a design professional.

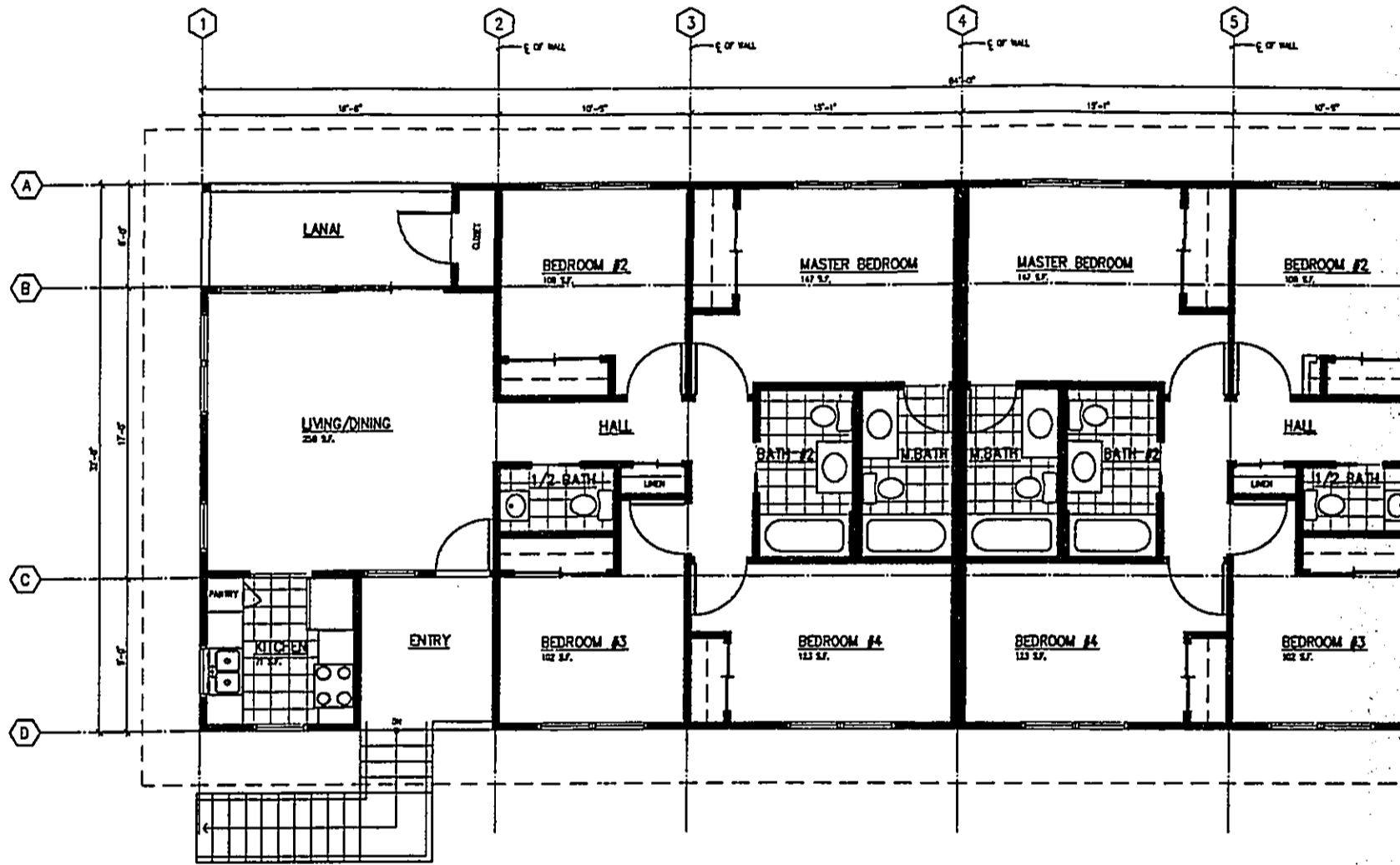
Designed by: RL, DT
Drawn by: DL, GT
Project No: 01170
Date: 6-30-88
Sheet No:

SK-8

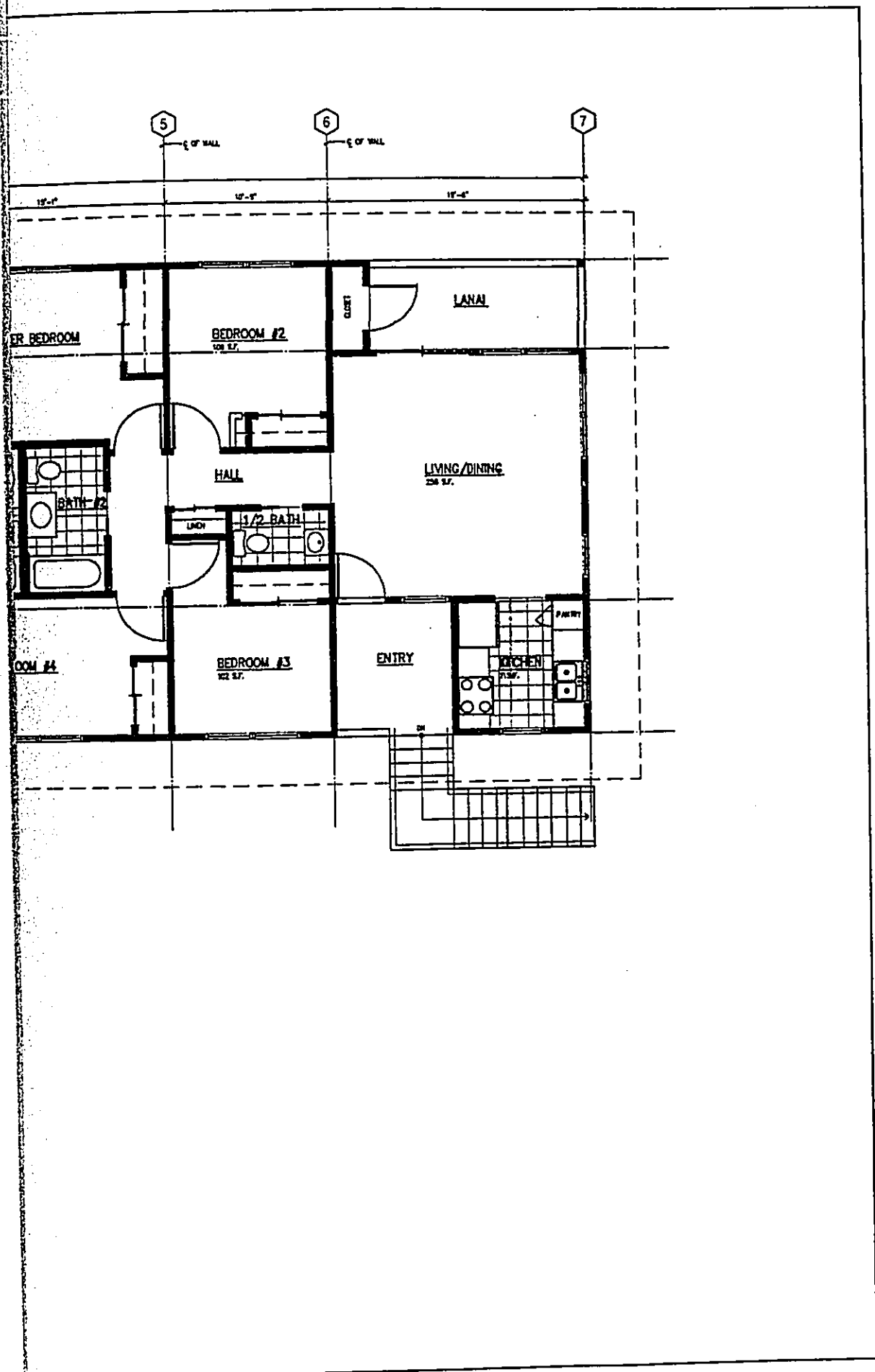


AREA CALCULATIONS

1180 SF	LIVING AREA
98 SF	LAMAI & CLOSET
1,278 SF	GROSS UNIT AREA
X 4	TOTAL UNITS (BLOC. '0')
5,112 SF	TOTAL GROSS UNIT AREA



BUILDING 'D' - SECOND FLOOR PLAN
 SCALE: 1/4"=1'-0"
 (FOUR BEDROOM UNITS)



GYA ARCHITECTS, INC.
 A DESIGN CORPORATION
 5425
 Waialeale Street Professional Center
 Suite 203
 2145 Waialeale Street
 Waialeale, Maui, Hawaii 96753
 Phone (808) 242-4646
 Fax (808) 242-4675
 OAHU
 Bank of America Building
 Suite 1230
 1337 Kalia Road
 Honolulu, Hawaii 96814
 Phone (808) 255-2008
 Fax (808) 255-2023

WAIALE AFFORDABLE HOUSING
 WAILUKU, MAUI, HAWAII
 TMK: 3-8-48-21

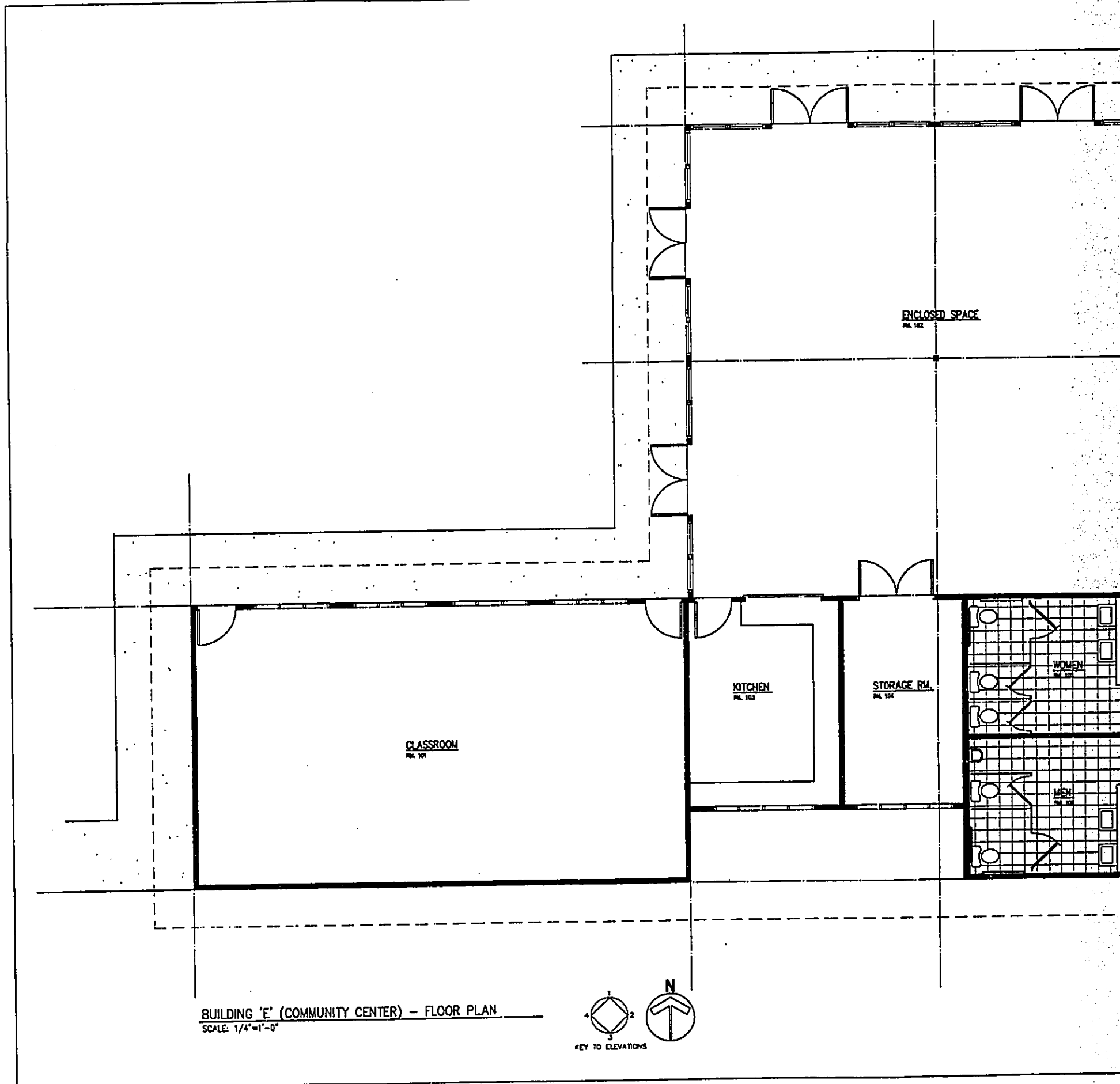
SECOND FLOOR PLAN

This work was prepared by me or under my supervision and I am a duly licensed professional engineer and architect in the State of Hawaii. I am not providing this work as a basis for any other project or for any other purpose. I am not responsible for any errors or omissions in this work.

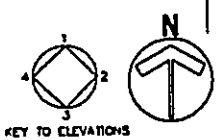
Designed by: RL, DL
 Drawn by: DL, FF
 Project No.: 04117.0
 Date: 8-22-88
 Sheet No.:

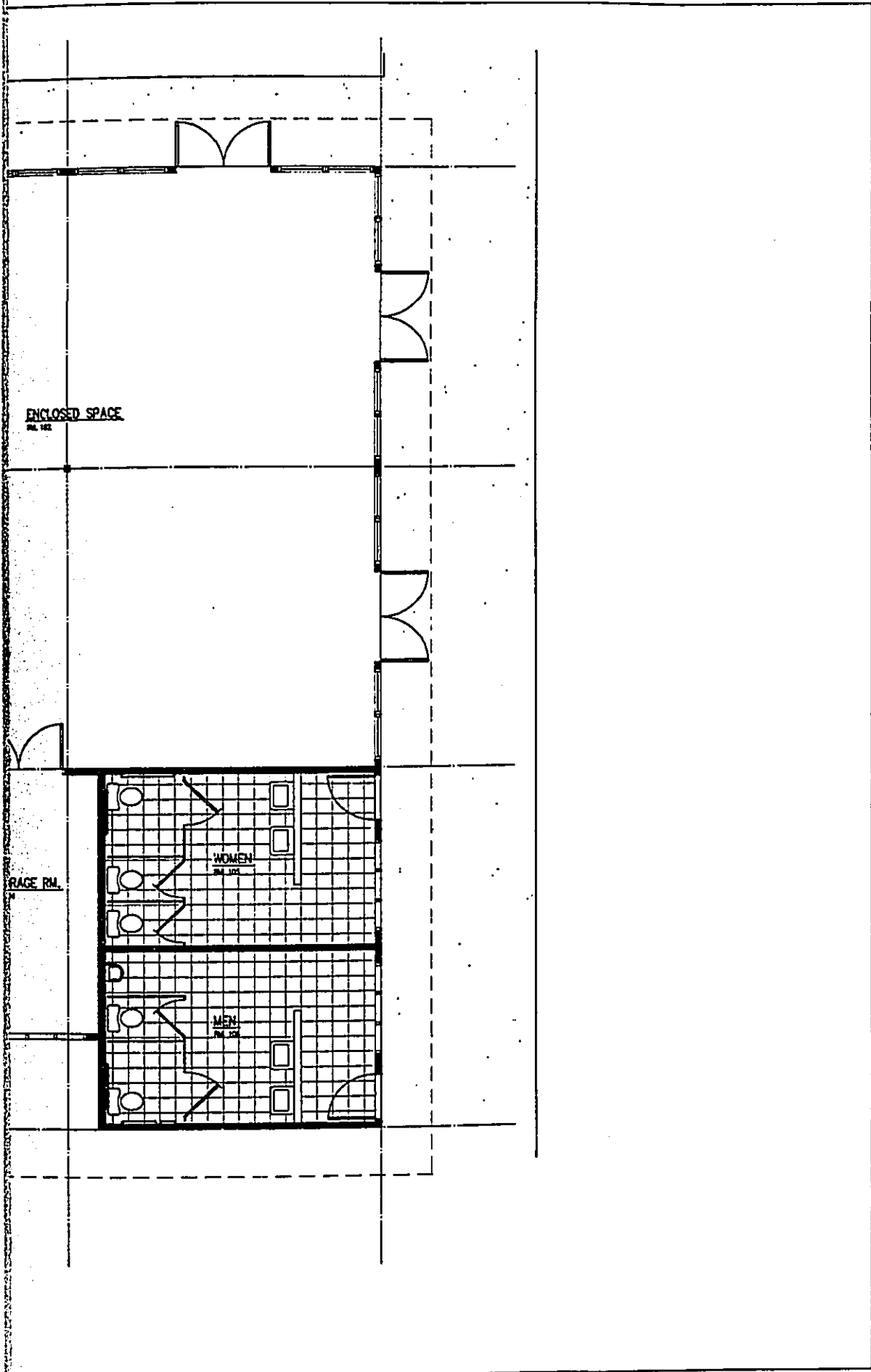
SK-9

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BUILDING 'E' (COMMUNITY CENTER) - FLOOR PLAN
SCALE: 1/4"=1'-0"





GVA ARCHITECTS, INC.
A DESIGN CORPORATION

620
1400 Street Professional Center
Suite 303
2145 Waike Street
Honolulu, Maui, Hawaii 96793
Phone (808) 242-4444
Fax (808) 242-4475
Circle
Bank of America Building
Suite 1230
1307 Kapahulu Boulevard
Honolulu, Hawaii 96816
Phone (808) 955-3038
Fax (808) 955-2008

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII

TMK: 3-8-48:21

FLOOR PLAN

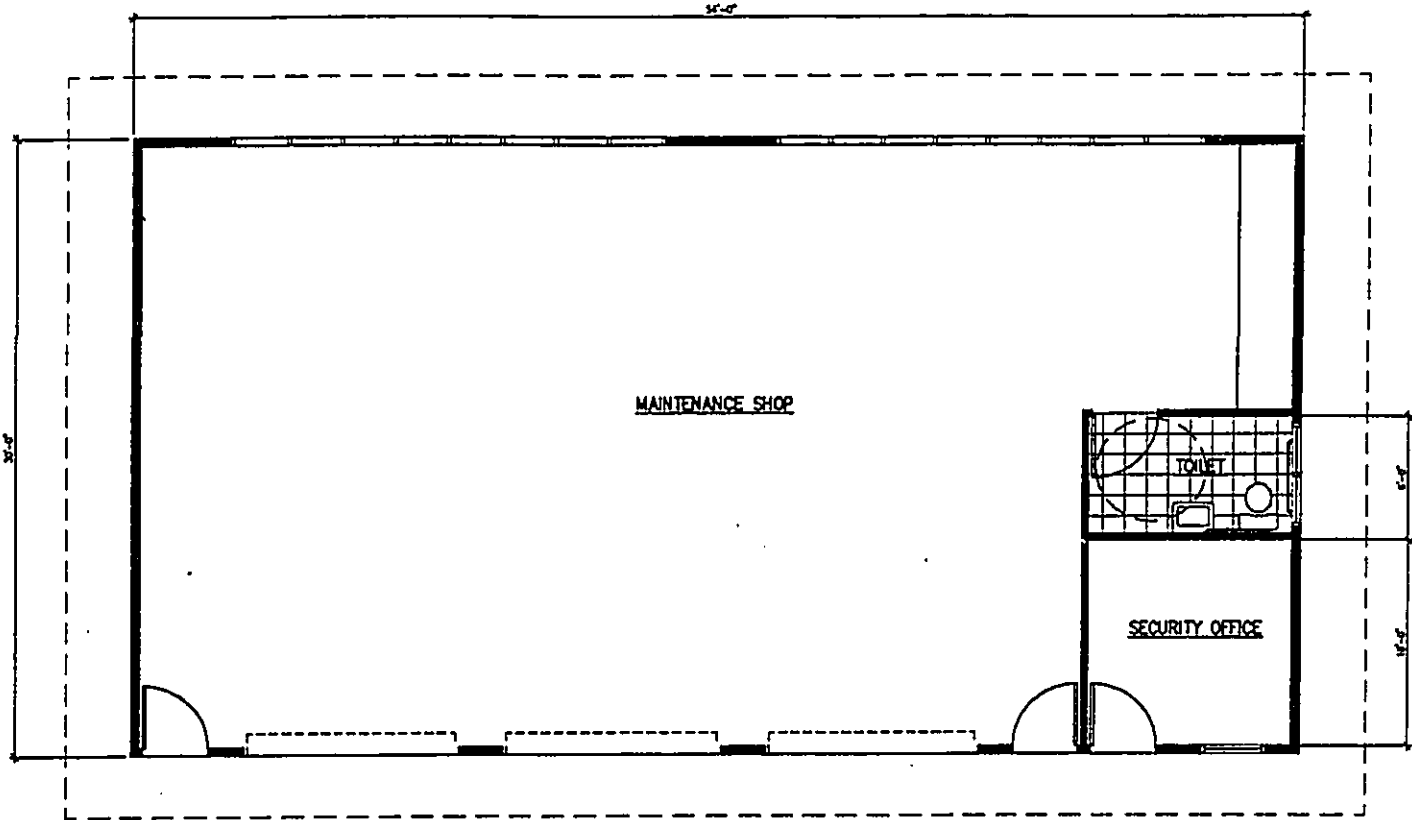
This plan was prepared by me or under my supervision and to the best of my knowledge and belief it complies with all applicable laws, codes, regulations, rules, ordinances, and requirements of the Department of Health, Department of Planning, and Department of Public Works, and I am a duly Licensed Professional Engineer, Architect, Surveyor, and Landscape Architect.

Signature: _____
Title: _____

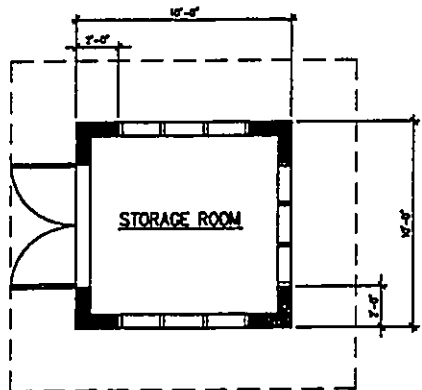
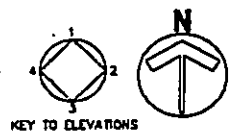
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Designed by: RA, DA
Drawn by: DA
Project No: 0417.0
Date: 6-30-88

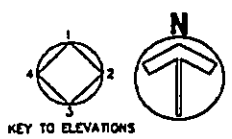
SK-10

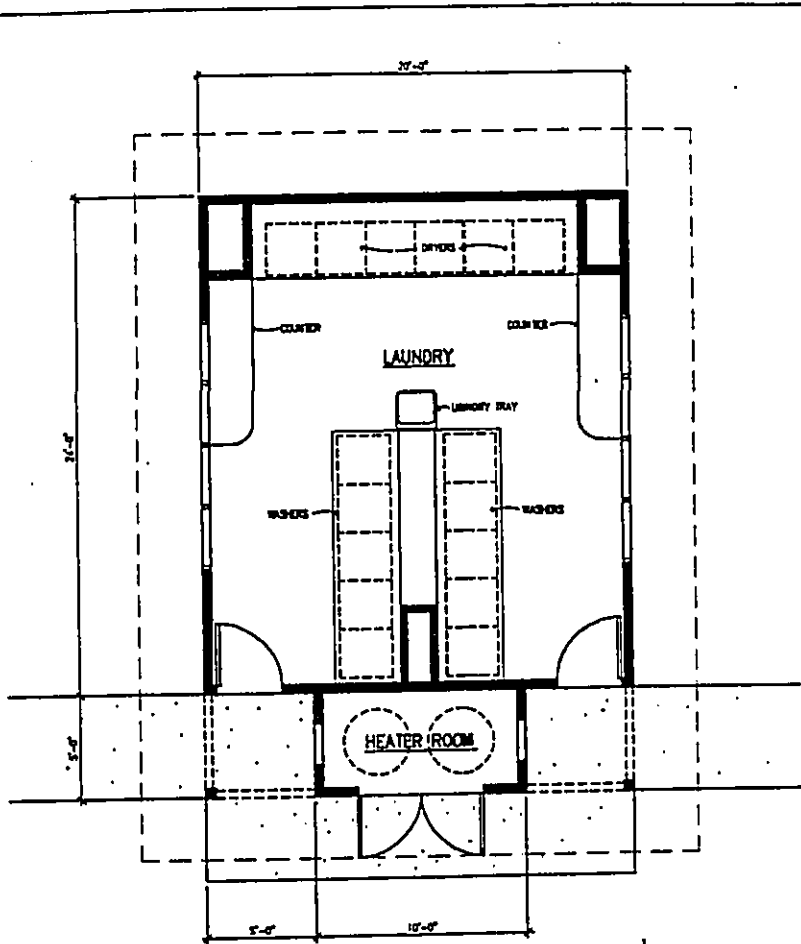


BUILDING 'F' (MAINTENANCE) - FLOOR PLAN
 SCALE: 1/4"=1'-0"



BUILDING 'H' (STORAGE) - FLOOR PLAN
 SCALE: 1/4"=1'-0"





BUILDING 'G' (LAUNDRY) - FLOOR PLAN
 SCALE: 1/4"=1'-0"



GVA ARCHITECTS, INC.
 A DESIGN CORPORATION

MAIL
 Waialeale Professional Center
 Suite 303
 2145 Waialeale Street
 Waialeale, Maui, Hawaii 96753
 Phone (808) 242-4444
 Fax (808) 242-4673
 OAHU
 Bank of America Building
 Suite 1230
 1357 Kapiolani Boulevard
 Honolulu, Hawaii 96814
 Phone (808) 525-3008
 Fax (808) 524-3000

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII

TAK: 3-8-48:21

BLDG. 'F' FLOOR PLAN
 BLDG. 'G' FLOOR PLAN
 BLDG. 'H' FLOOR PLAN

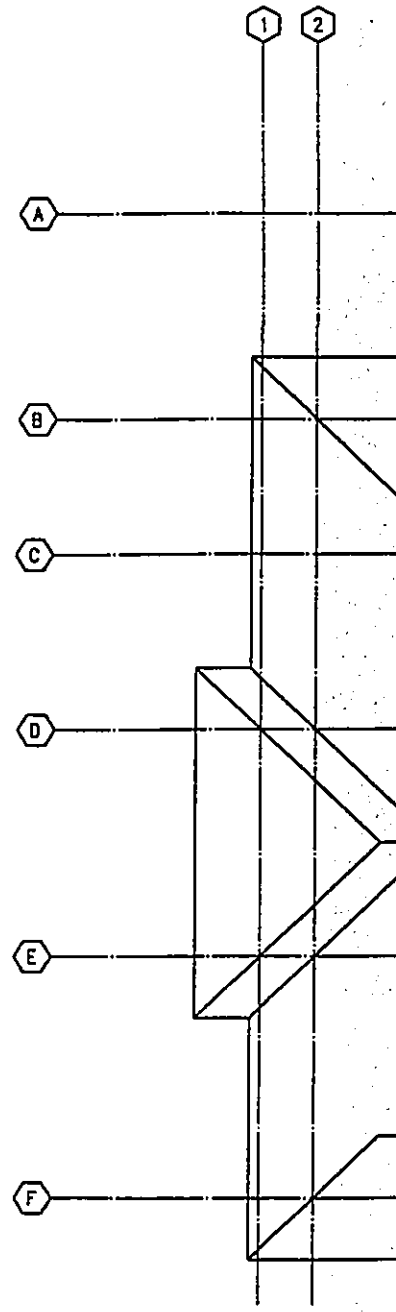
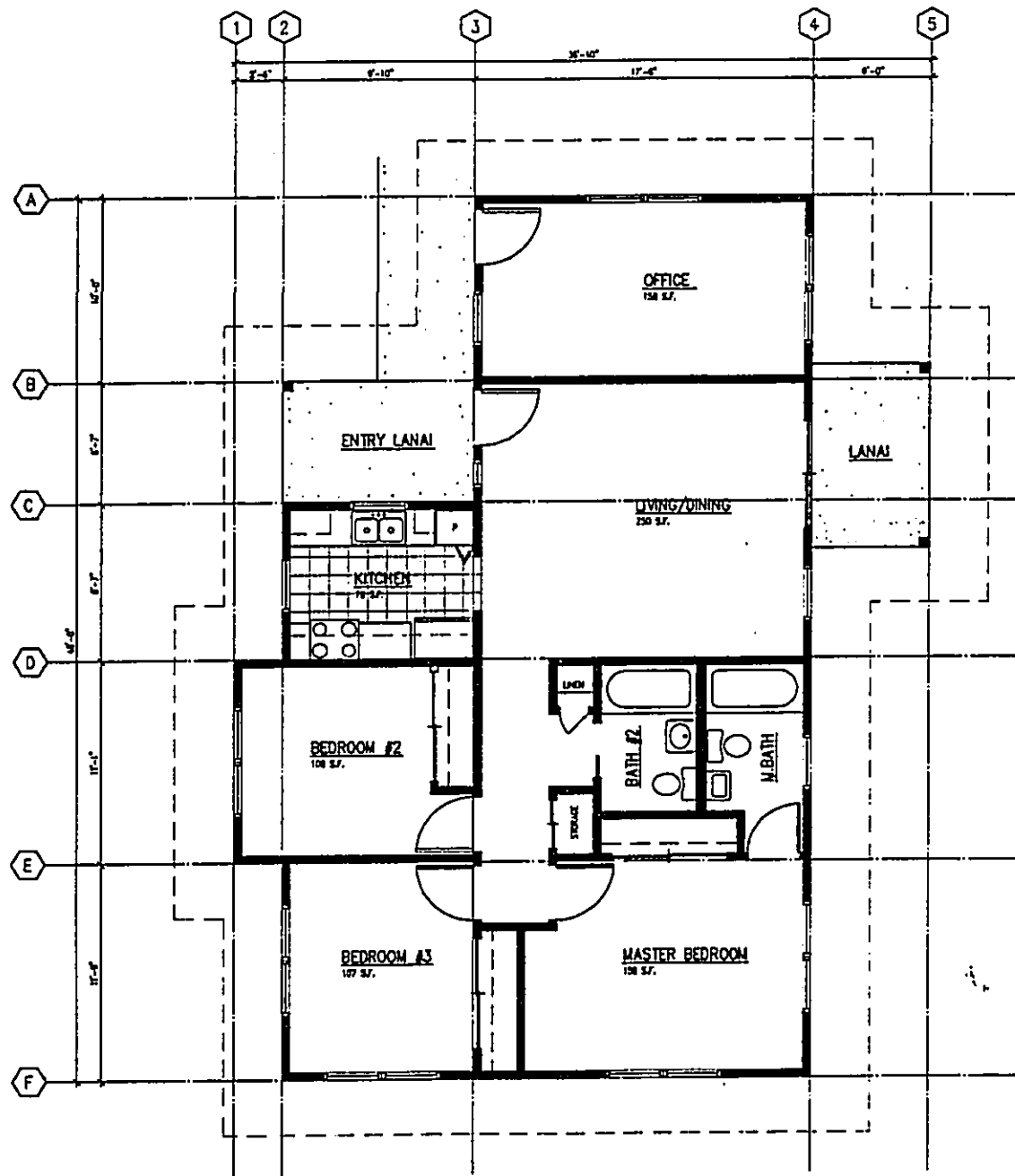
This work was prepared for use in connection with the project described above and is not to be used for any other project without the written consent of the architect. The architect assumes no responsibility for the construction of the project or for the accuracy of the information provided by others.

Designed by: [Signature]
 Drawn by: [Signature]

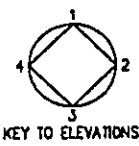
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Designed by: [Signature]
 Drawn by: [Signature]
 Project No. 04172
 Date: 8-28-85
 Sheet No.

SK-11



BUILDING 'J' - FLOOR PLAN
 SCALE: 1/4"=1'-0"
 (MANAGER'S UNIT & OFFICE)



BUILDING
 SCALE: 1/4"



GVA ARCHITECTS INC.
A DESIGN CORPORATION

MAUI
Walt Street Professional Center
Suite 303
2148 Walt Street
Wailea, Maui, Hawaii 96753
Phone (808) 242-4444
Fax (808) 242-4873
OAHU
Bank of America Building
Suite 1230
1337 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 953-3008
Fax (808) 953-2005

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII

TMK: 3-8-48-21

FLOOR PLAN

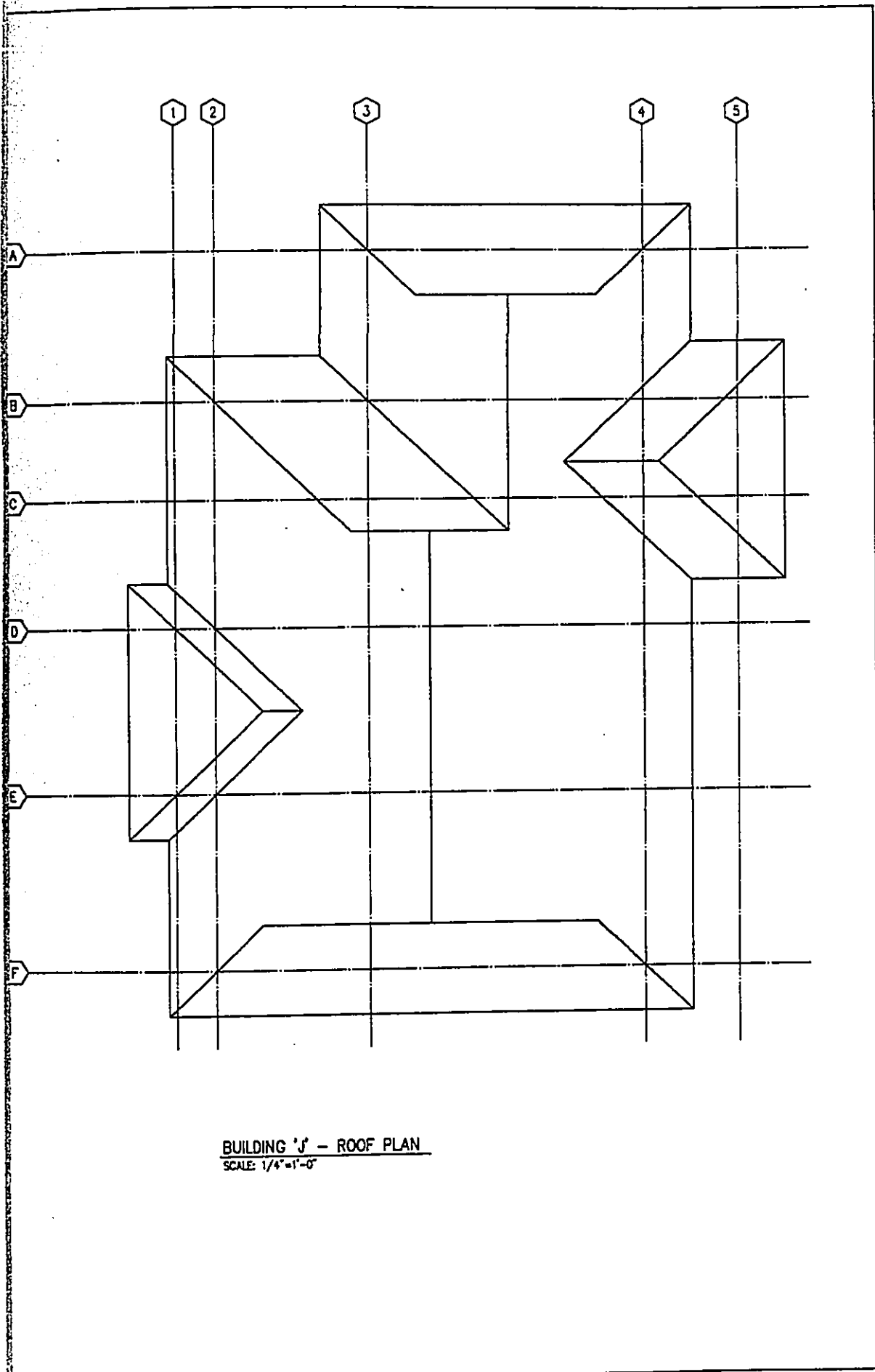
NOTICE
This work was prepared by me or under the supervision and control of me and I am a duly licensed Professional Engineer, Professional Architect, Professional Engineer, Professional Surveyor, and Landscape Architect.

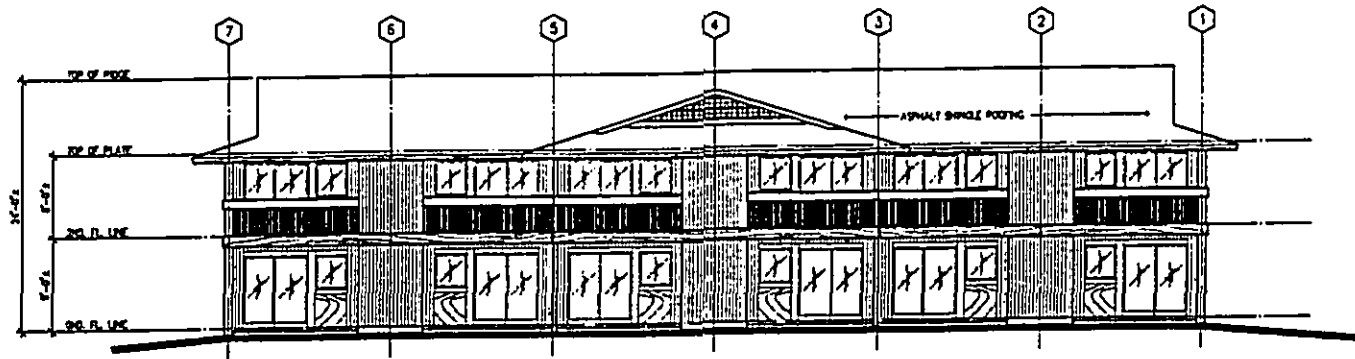
REVISIONS
Date: _____
Description: _____
By: _____
Checked: _____

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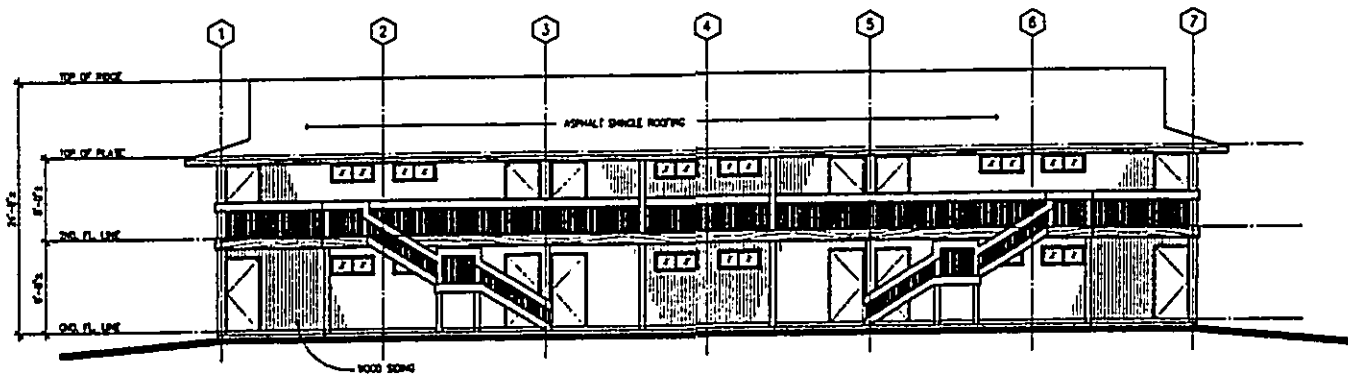
Designed by: **RL, DH**
Drawn by: **DH**
Project No.: **04117.0**
Date: **6-30-95**
Sheet No.:

SK-12



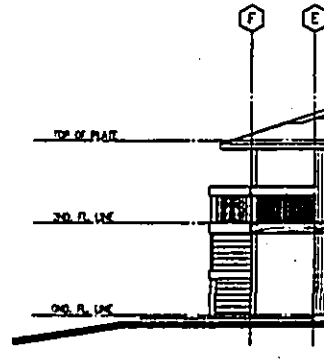


ELEVATION - 1

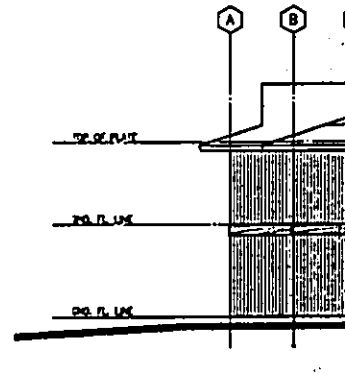


ELEVATION - 3

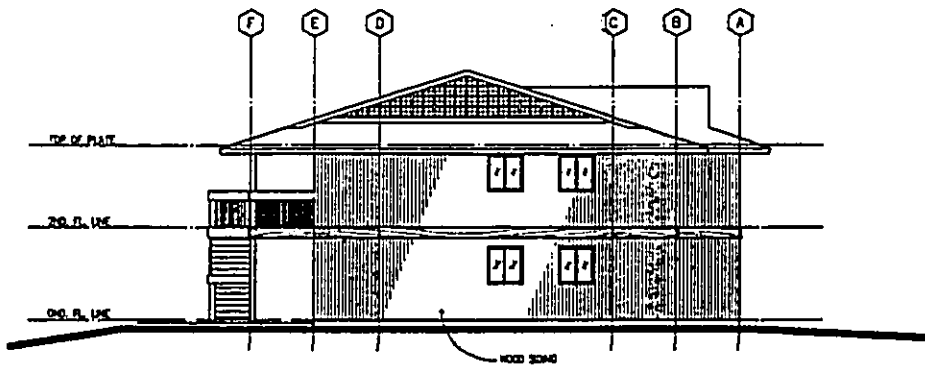
BUILDING 'A' - EXTERIOR ELEVATIONS
SCALE: 1/8"=1'-0"



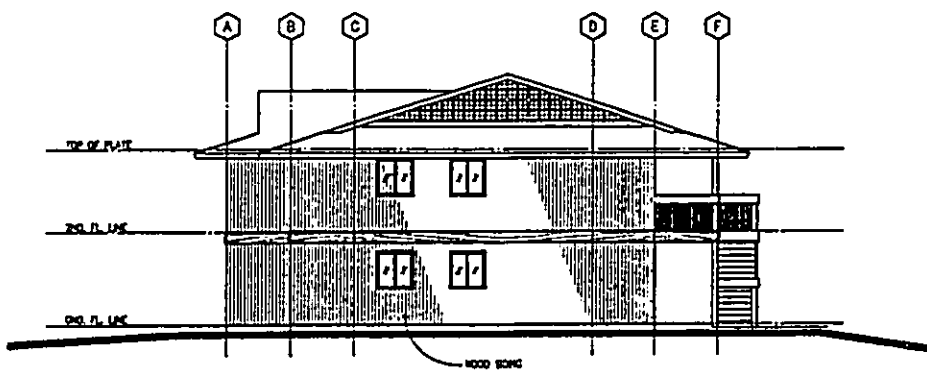
ELEVATION



ELEVATION



ELEVATION - 2



ELEVATION - 4



GYA ARCHITECTS INC.
A DESIGN CORPORATION

HALE
1044 Street Professional Center
Suite 303
2145 Wale Street
Halehale, Maui, Hawaii 96713
Phone (808) 242-4444
Fax (808) 242-4472
OAHU -
Bank of America Building
Suite 1230
1337 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 928-3008
Fax (808) 928-3000

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII
TMK: 3-8-49:21

EXTERIOR ELEVATIONS

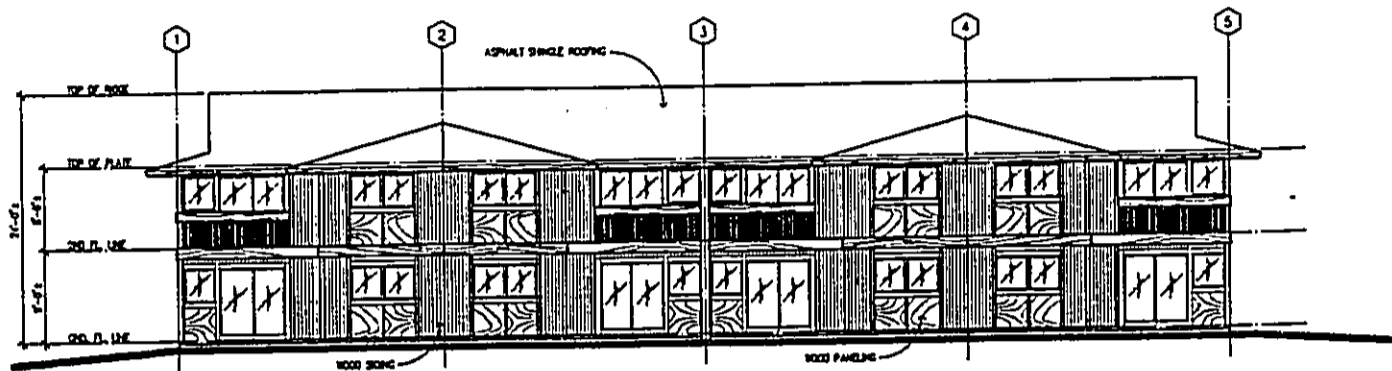
The work was prepared by me or under my direct supervision and I am a duly licensed professional engineer in the State of Hawaii. I certify that the work was done in accordance with the provisions of the Hawaii Professional Engineering Act and the Hawaii Professional Engineering Rules and Regulations.

By: _____
Title: _____
Date: _____

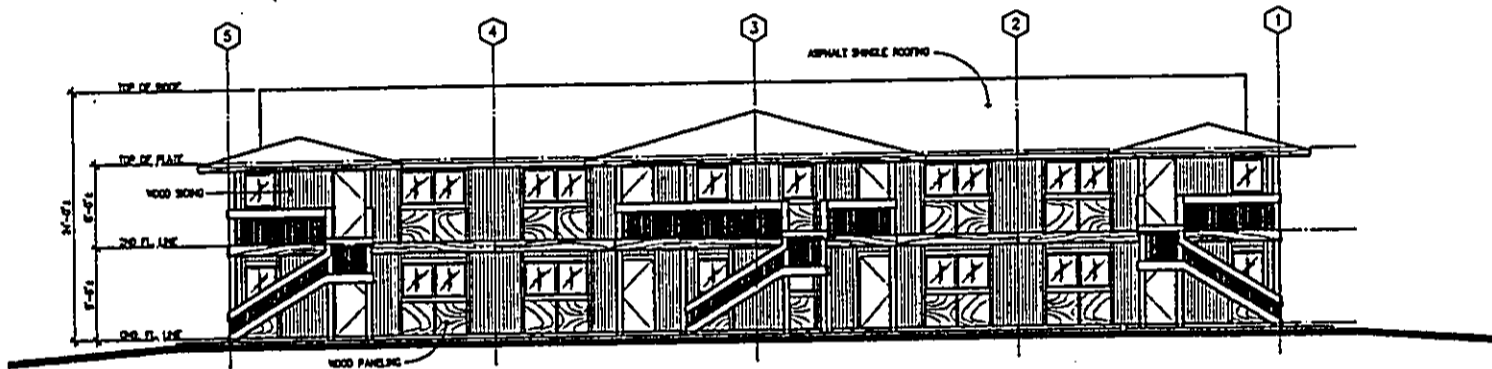
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Designed by: **SK, OH**
Drawn by: **GT**
Project No: **500119**
Date: **6-20-88**
Sheet No:

SK-13

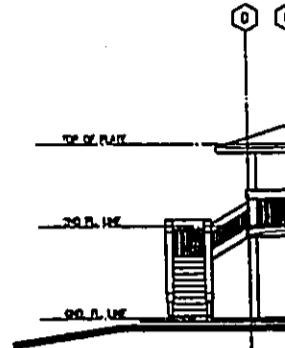


ELEVATION 1

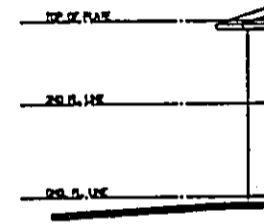


ELEVATION 3

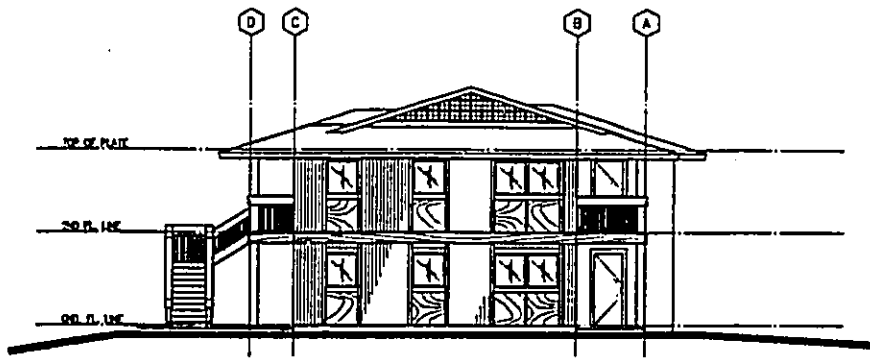
BUILDING 'B' - EXTERIOR ELEVATIONS
 SCALE: 1/8"=1'-0"



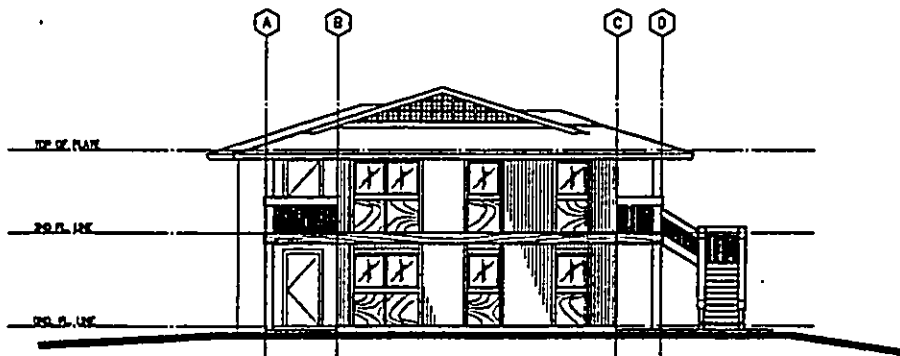
EL



EL



ELEVATION 2



ELEVATION 4



GVA ARCHITECTS, INC.
A DESIGN CORPORATION

1240
Waiale Street Professional Center
Suite 303
2145 Waiale Street
Waialeale, Maui, Hawaii 96793
Phone (808) 242-4666
Fax (808) 242-4673
GMAE
Bank of America Building
Suite 1230
1337 Kapahulu Boulevard
Honolulu, Hawaii 96816
Phone (808) 855-3000
Fax (808) 855-3000

WAIALE AFFORDABLE HOUSING

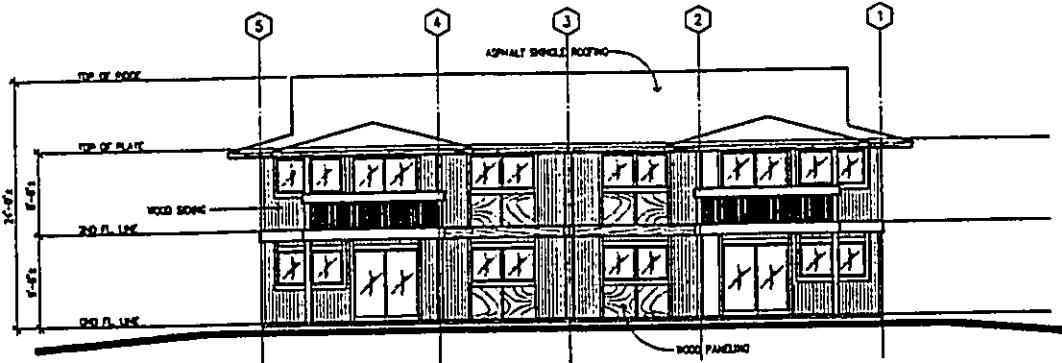
WAILUKU, MAUI, HAWAII
TMK: 3-8-46:21

EXTERIOR ELEVATIONS

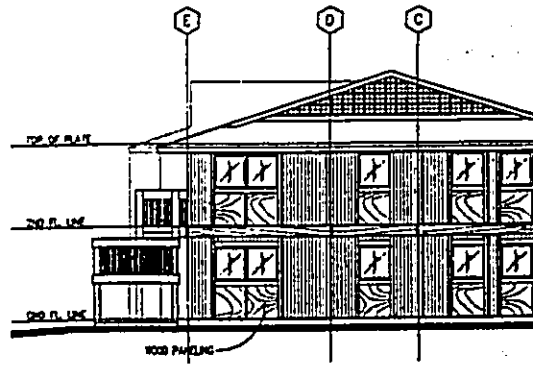
This work was prepared by me or under my direct supervision and I am a duly licensed professional architect in the State of Hawaii. I am not providing this work as part of a larger project or as part of a larger contract. I am providing this work as a separate project and I am not providing this work as part of a larger project or as part of a larger contract.

Designed by: **PA, DA**
Drawn by: **CI**
Project No.: **04173**
Date: **6-20-88**

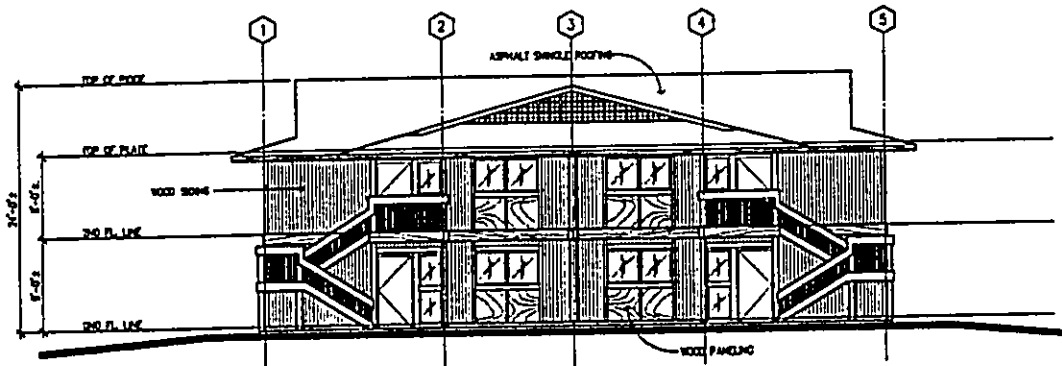
SK-14



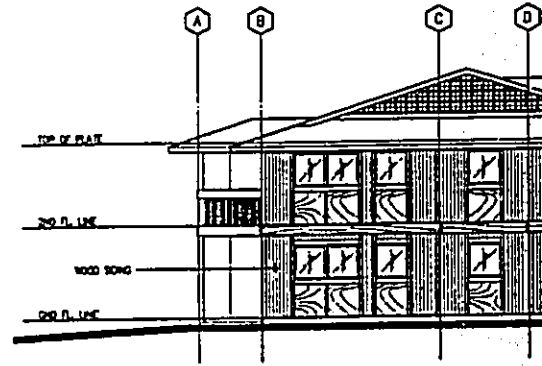
ELEVATION - 1



ELEVATION - 2

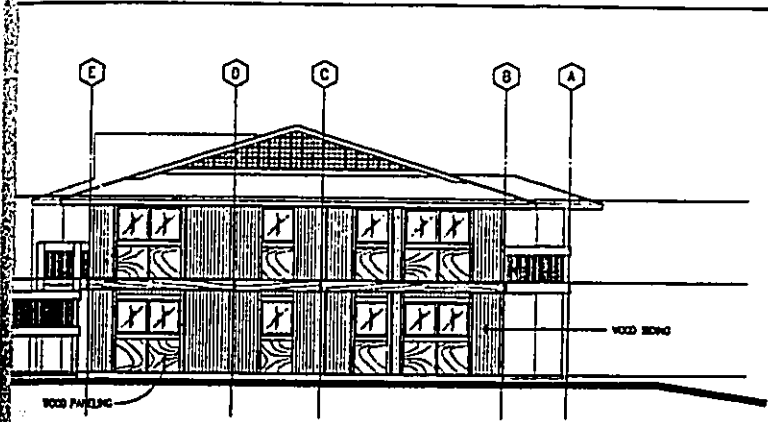


ELEVATION - 3

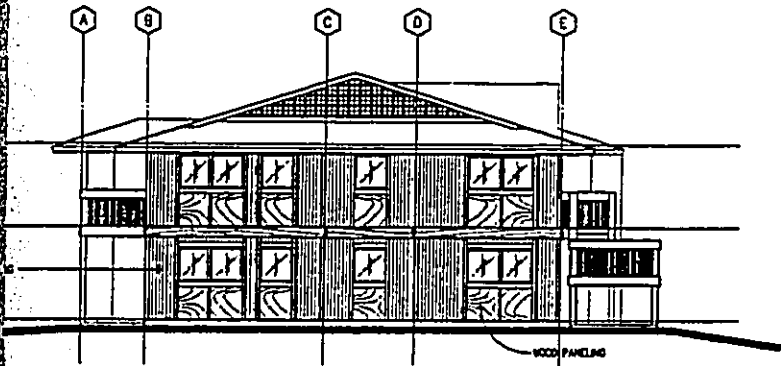


ELEVATION - 4

BUILDING 'C' - EXTERIOR ELEVATIONS
SCALE: 1/8"=1'-0"



ELEVATION - 2



ELEVATION - 4



GVA ARCHITECTS, INC.
A DESIGN CORPORATION

HALE
Waie Street Professional Center
Suite 303
2148 Waie Street
Waipahoehoe, Maui, Hawaii 96793
Phone (808) 242-4444
Fax (808) 242-4875
OAHU
Bank of America Building
Suite 1230
1337 Kapitol Boulevard
Honolulu, Hawaii 96814
Phone (808) 533-3008
Fax (808) 533-2005

WAIALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII
TMK: 3-8-48-21

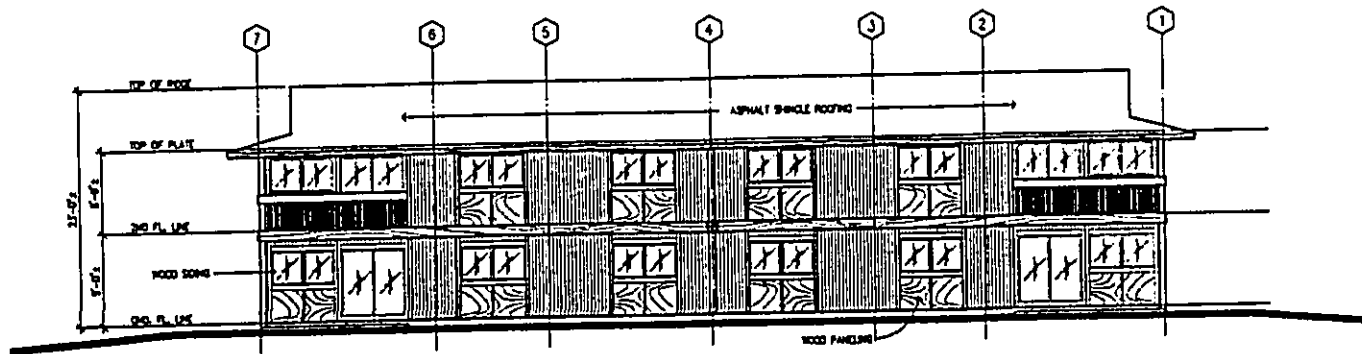
EXTERIOR ELEVATIONS

NOTES
1. See also the attached drawings for all details and specifications of the work to be done. All dimensions are to be taken from the finished face of the work unless otherwise noted.
2. All work shall be in accordance with the Hawaii Building Code, 1994 Edition, and all applicable local ordinances and codes.
3. All materials and workmanship shall be subject to inspection and approval by the local building official.

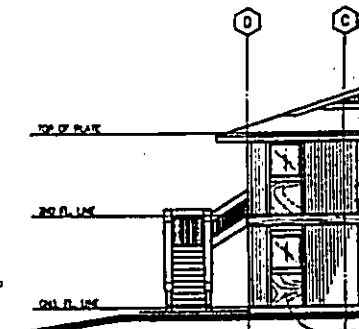
1. _____
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10. _____

Designed by: RML, OH
Drawn by: CT
Project No.: 94017.0
Date: 6-30-95
Sheet No.:

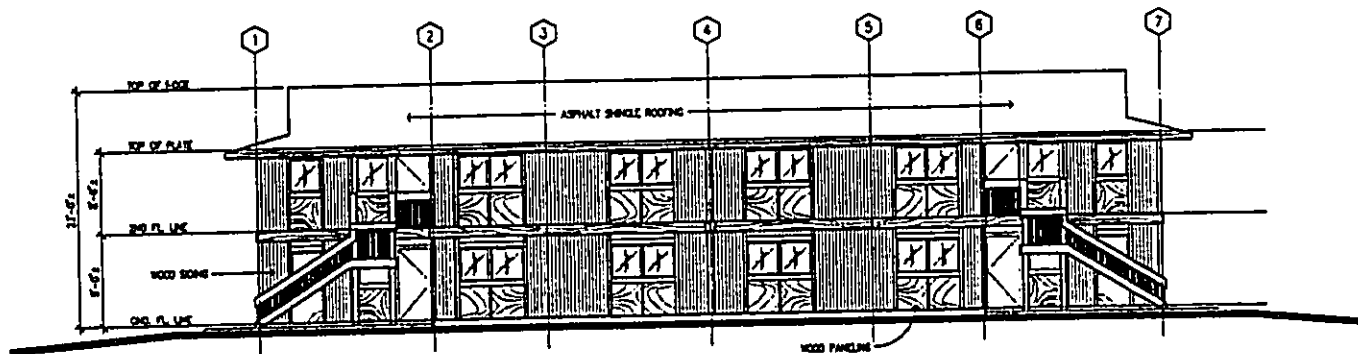
SK-15



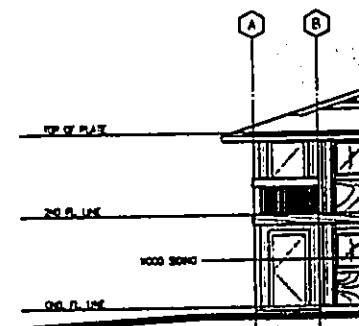
ELEVATION 1



ELEVATION 2

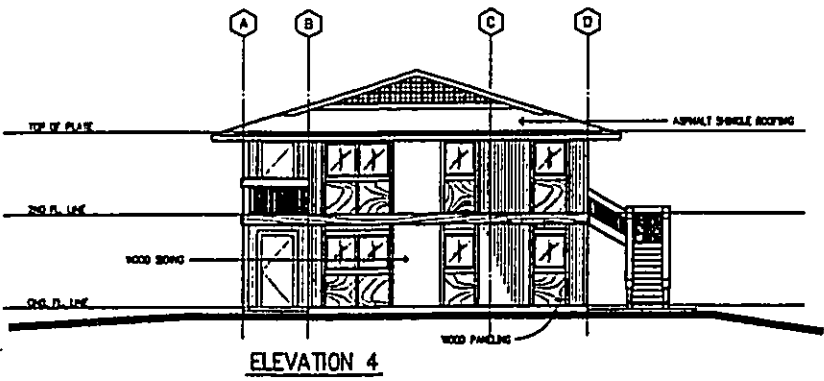
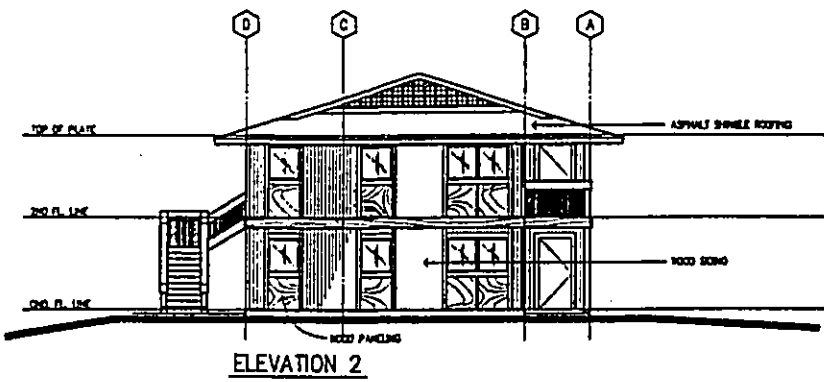


ELEVATION 3



ELEVATION 4

BUILDING 'D' - EXTERIOR ELEVATIONS
SCALE: 1/8"=1'-0"



GVA ARCHITECTS, INC.
A DESIGN CORPORATION

MAIL
Walt Street Professional Center
Suite 303
2145 Wale Street
Haleakala, Maui, Hawaii 96743
Phone (808) 242-4488
Fax (808) 242-4475
OAHU
Bank of America Building
Suite 1230
1337 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 953-3038
Fax (808) 953-2000

WAIKALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII
TEL: 3-8-48:21

EXTERIOR ELEVATIONS

NOTICE
This work has been prepared by us or under our supervision and execution of the project is under our immediate supervision of the architect or his duly authorized representative. It is not to be construed as a representation of the architect's liability for the design of the project or for the construction of the project.

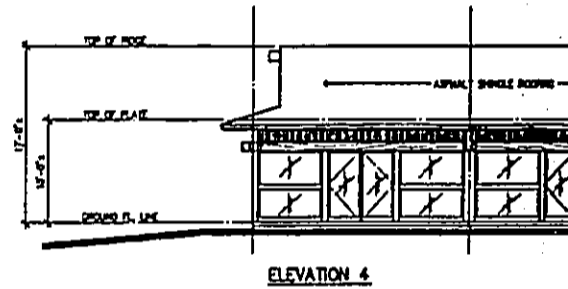
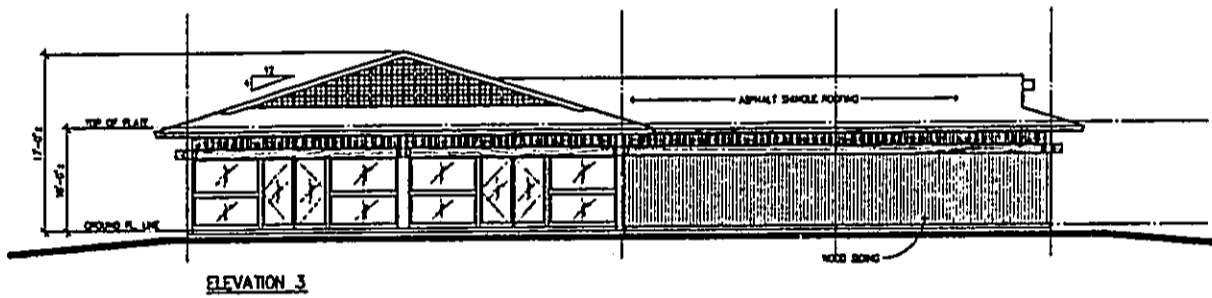
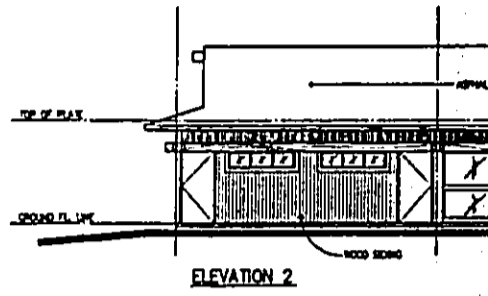
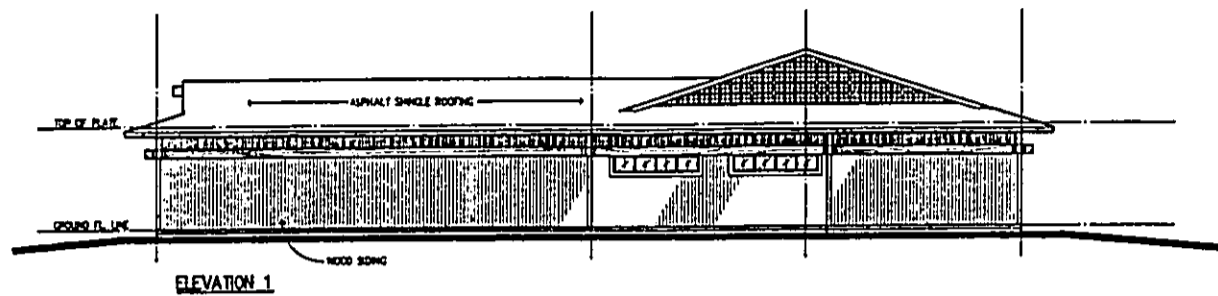
Approved:

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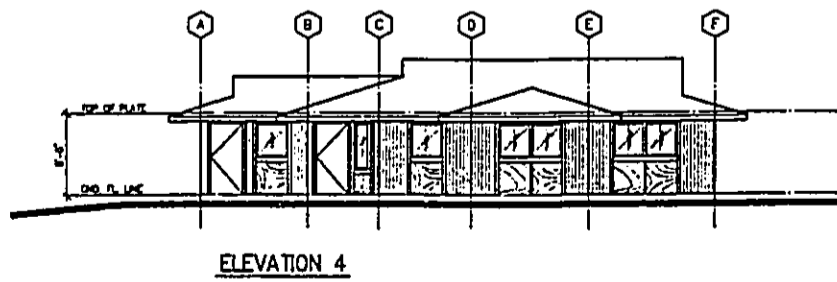
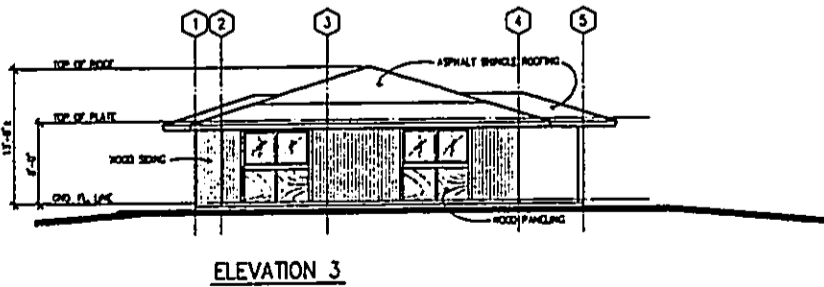
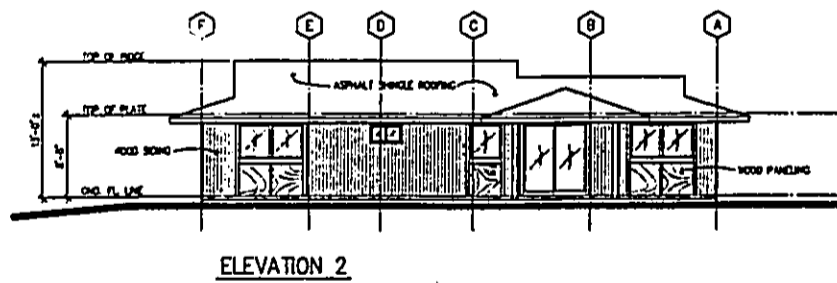
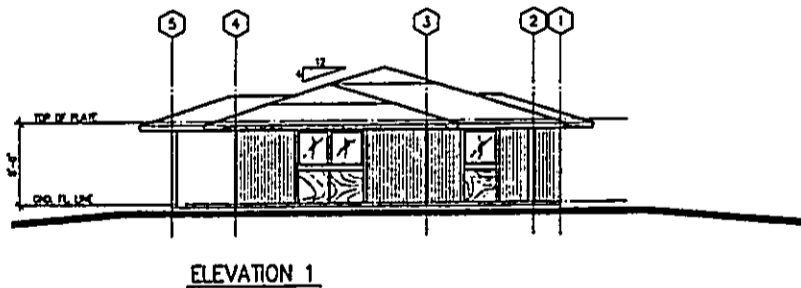
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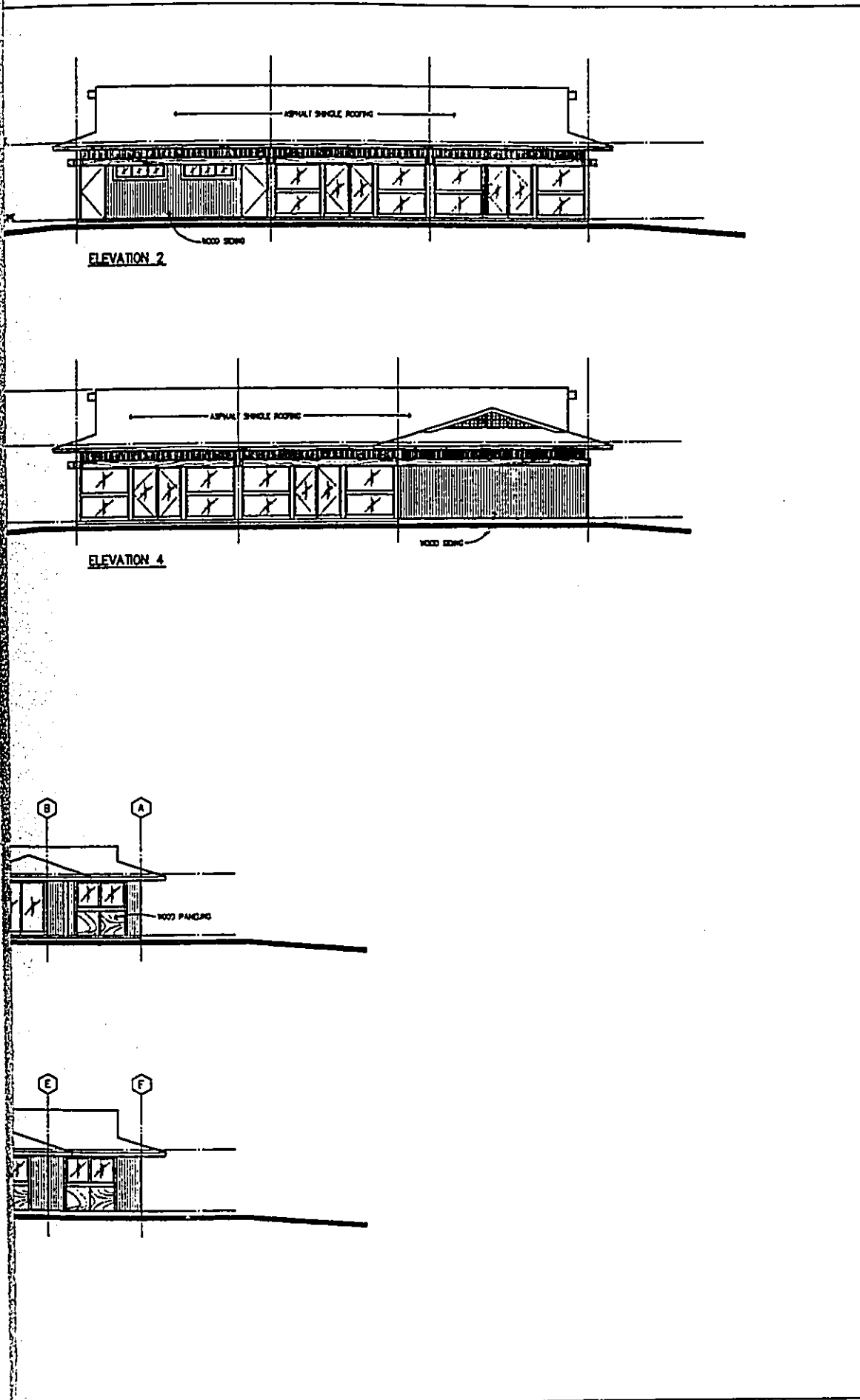
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A DESIGN CORPORATION

MAI
Wala Street Professional Center
Suite 303
2143 Wala Street
Wailuku, Maui, Hawaii 96793
Phone (808) 242-4666
Fax (808) 242-4675

KAHA
Bank of America Building
Suite 1230
1337 Kapiolani Boulevard
Honolulu, Hawaii 96814
Phone (808) 853-3009
Fax (808) 955-2003

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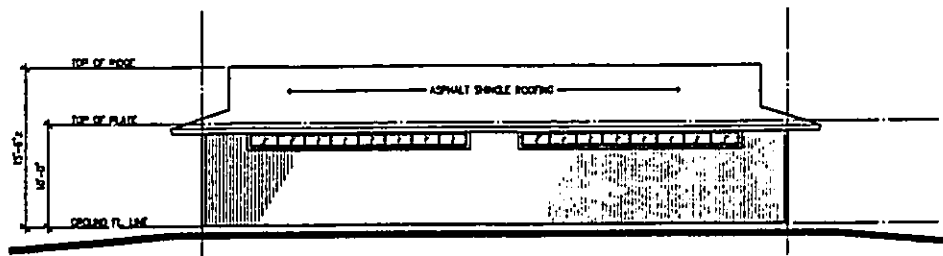
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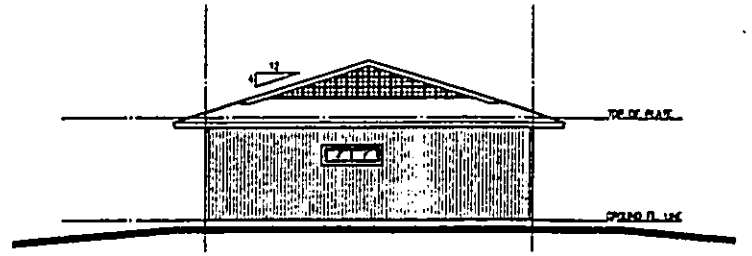
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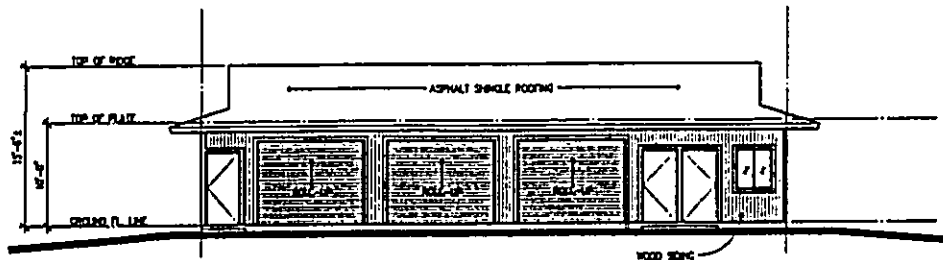
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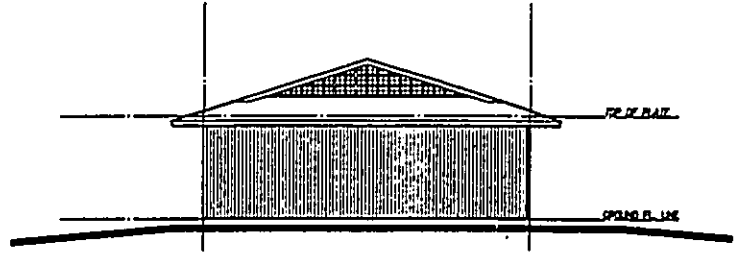
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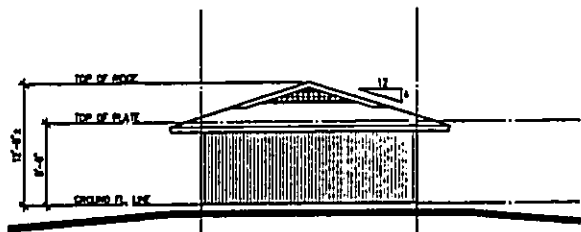


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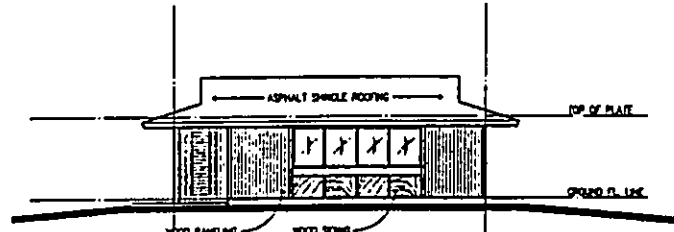


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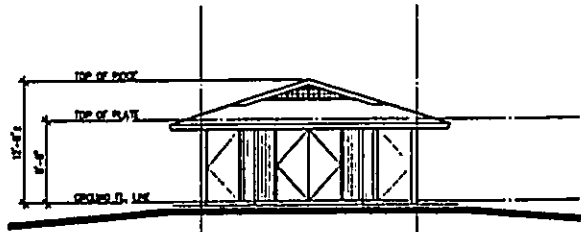
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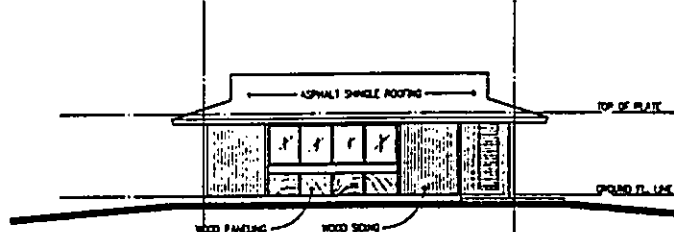
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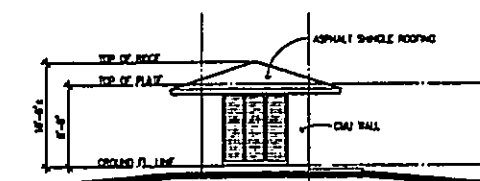


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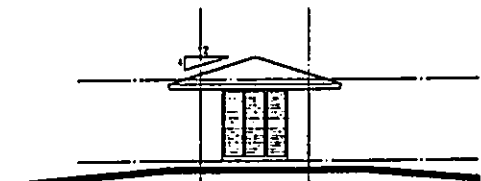


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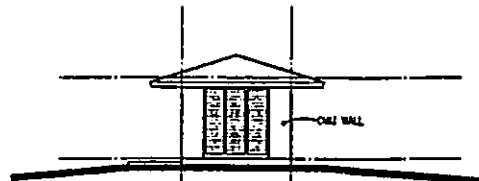
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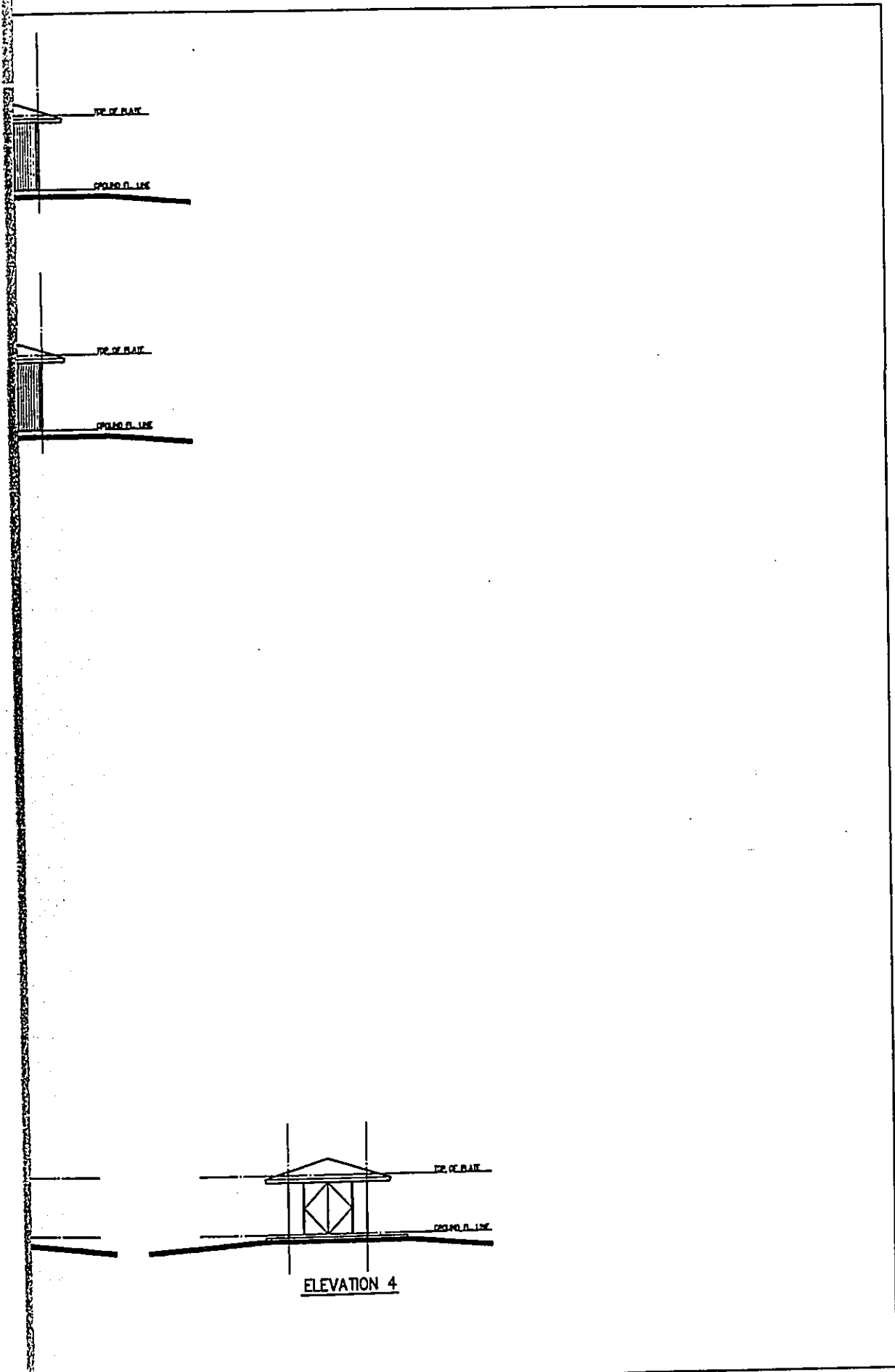


ELEVATION 2



ELEVATION 3

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GYA ARCHITECTS INC.
A DESIGN CORPORATION

MAUI
Maui Street Professional Center
Suite 303
2140 Maui Street
Haleakala, Maui, Hawaii 96713
Phone (808) 242-4664
Fax (808) 242-4675

KAUAI
Bank of America Building
Suite 1130
1137 Kalia Road
Honolulu, Hawaii 96814
Phone (808) 933-3000
Fax (808) 933-2000

WAIKALE AFFORDABLE HOUSING

WAILUKU, MAUI, HAWAII

TEL: 3-8-48:21

EXTERIOR ELEVATIONS

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Revisions:
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Appendix B

Archaeological Inventory Survey

**AN ARCHAEOLOGICAL INVENTORY
SURVEY OF A 15 ACRE PARCEL
ALONG WAIALE ROAD, WAILUKU
AHUPUA'A, WAILUKU DISTRICT,
MAUI ISLAND (TMK 3-8-46: 21)**

Prepared for:

**Munekiyo and Arakawa, Inc.
Wailuku, Hawaii**

Prepared by:

**Xamanek Researches
P.O. Box 131
Pukalani, Hawaii**

**Erik M. Fredericksen
Demaris L. Fredericksen**

June, 1995

ABSTRACT

An archaeological inventory survey was conducted on a c. 15 acre parcel (TMK 3-8-46: 21) located in Wailuku *ahupua'a*, Wailuku District, Island of Maui. A pedestrian survey covering the entire property was first conducted. Subsequent subsurface investigation included 43 backhoe trenches, 21 auger tests, and 2 manual test units. No significant cultural resources were encountered during the inventory survey.

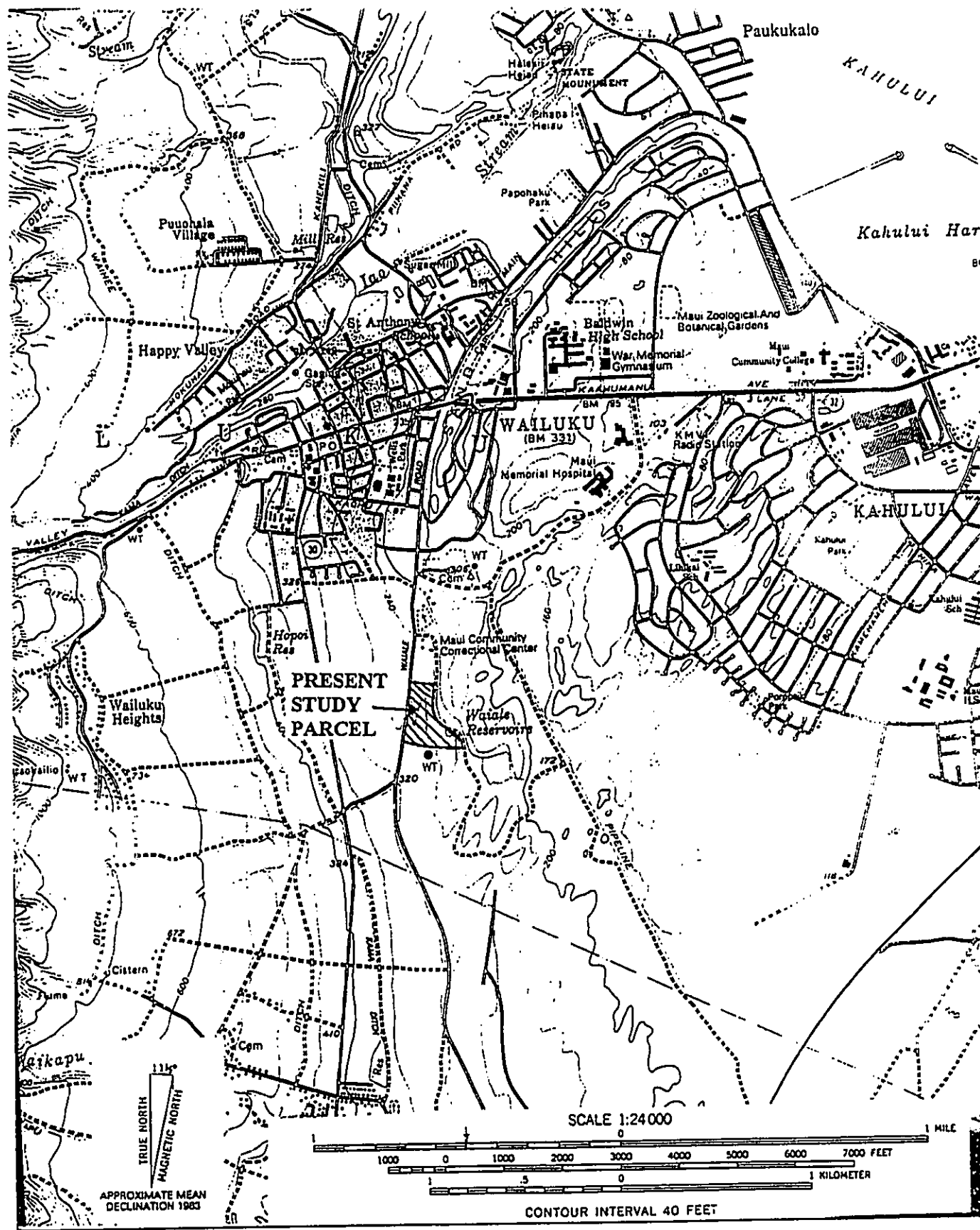
Although no evidence of significant cultural resources was located on the survey area, monitoring by a qualified archaeologist during construction activities is recommended. Two large, intact sand dunes cross the subject parcel in a roughly N-S direction and deposits of sand a meter or more thick are present on over 80% of sampled portions of the property. While no evidence of human skeletal remains was encountered during the inventory survey, Site 50-50-4-2916 is located on the adjacent property to the north. Three adult burials were uncovered during grading activities prior to construction of the Ka Hale A Ke Ola Homeless Resource Center. The possibility exists that isolated burials could be located on the subject parcel. Consequently, archaeological monitoring is recommended during any earth moving activities on this c. 15 acre property.

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Map 1 - Topographic Map, U. S. G. S., Wailuku Quadrangle, 1983.

INTRODUCTION

Xamanek Researches was contacted by Munekiyo and Arakawa, Inc. in November of 1994, regarding the undertaking of an archaeological inventory survey on a 15 acre parcel located in Wailuku *ahupua'a*, along Waiale Road adjacent to the Ka Hale A Ke Ola Homeless Resource Center. Its TMK designation is 3-8-46: 21. A 180 to 200 unit affordable rental housing project is proposed for the site by the County of Maui, owner of the property. Work on the archaeological inventory survey did not begin until May of 1995, however.

The western border of the subject parcel is marked by Waiale Road, and the northern boundary by a chain link fence surrounding the Homeless Resource Center. The eastern border is marked by Waiale Reservoir, and the southern boundary by a dirt road and a County Board of Water Supply water tank station.

STUDY PARCEL

Natural History

The subject parcel lies on the western side of the Kahului Isthmus, on the alluvial slopes of the West Maui Mountains. The c. 15 acre study area is dominated by 2 sand dunes. The soils are classified as Pu'uone sands, and are part of the west central portion of the Pu'uone sand dunes formation, which extends from Waikapu to Kahului Harbor. These dune formations are underlain by lava flows from Haleakala and alluvial sediments from the West Maui Mountains (Stearns and Macdonald, 1942, p. 54). Pu'uone sand is grayish-brown to light brown in color, and forms layers of strongly alkaline cemented sand hard pan (referred to as lithified sand in this report), 20 to 40 inches below the surface. In some instances, the loose sand has blown away, making this feature much closer to the surface. Old root molds filled with hard, white alkaline deposits are a common feature in the sands (Foote, et. al., 1972, p. 117). Pu'uone sands occur on slopes of 7 to 30 degrees, and develop in material derived from coral and sea shells (Ibid.). Elevation of the subject parcel ranges from a low of c. 220 feet AMSL along its southeastern border to c. 290 feet AMSL in its southwestern corner along a sand dune "ridge". In general, the parcel slopes downward to the east.

Annual rainfall in this area of Maui averages 20 inches. The highest monthly rainfall occurs during the winter and spring months (University of Hawaii, 1983, p. 56). Surface water is brought from West Maui streams through a system of ditches and flumes associated with the Waihe'e Ditch, the Spreckel's Ditch, the Kama Ditch, the Everett Ditch and the Waikapu Ditch (Donham, 1992, p. 1). The Waiale Reservoirs, which lie directly east of the study parcel, are fed by the Spreckel's Ditch, which brings water from the Waihe'e River. Temperatures range from 60 to 80 degrees Fahrenheit in January to 68 to 90 degrees Fahrenheit in July. Winds are generally trade winds from the northeast, ranging from 16 to 18 miles per hour.

Vegetation on the survey area consists of moderate to dense *kiawe* (*Prosopis pallida*) tree growth along the flanks and bases of the sand dunes, moderate *koa haole* (*Leucaena leucocephala*) cover along the ridges and dense understory growth composed of alien grass species, including buffelgrass (*Cenchrus ciliaris*). Alien grasses covered almost all of the ground surface and hampered visual inspection of the subject parcel. Other much less abundant plants noted included scattered *'ilima* (*Sida fallax*) shrubs and isolated *'uhalou* (*Waltheria americana*). No endemic plants were noted during inspection of the study area.

It appears that the subject property has not been heavily disturbed in the past. The most recent topographic map supplied by the County of Maui dates from 1964. No work has been done on the property since that map was made. Two large, intact sand dunes cross the subject parcel oriented roughly N-S. Exposed lithified sand is visible along the upper slopes and "ridges" of these two land forms. One backhoe trench (BT 14) yielded alluvium associated with an ephemeral stream. However, even this feature was underlain by sand deposits.

HISTORICAL BACKGROUND RESEARCH

Precontact Period

The *ahupua'a* of Wailuku is a large land unit stretching around Kahului Bay from Paukukalo to Kapukaulua. It includes Iao Valley and the northern half of the Kahului Isthmus. This land division comprises nearly half of the District of Wailuku. In precontact times, Wailuku is noted as being a place where chiefs were buried and wars were fought. The word itself can be translated as "water of destruction" (Pukui, et. al., 1974, p. 225), or "water of killing" (Ibid., p. 179). The name Wailuku refers to the battles which took place in the area.

During the late precontact period warfare increased, as chiefs from Maui, Oahu and Hawaii vied for political and military dominance. High chief Pi'ilani unified the

districts of Maui by warfare, but his sons fought a series of bloody battles with one another in order to establish political control. Eventually Kiha-a-Pi'ilani became victorious, and ruled Maui (Speakman, 1978, pp. 9-13). Each succeeding generation of chiefs had to struggle through warfare to secure their political dominance. During the reign of the last powerful paramount chief or king, Kahekili (from 1765 to 1790), Wailuku again became the site of intense warfare. Kahekili's royal residence, Kalanihale, was located in Wailuku, and in the mid-1770's it was marched upon by a Big Island chief, Kalani'opu'u and his *alapa* (the name given to his warriors). News of his coming preceded him, and Kahekili hid his men in the sand dunes above Haleki'i *heiau*, surprising the invading troops. Kalani'opu'u's army was pushed to the sea and slaughtered (Ibid., pp.16-17). By 1786 Kahekili controlled not only Maui, but Molokai, Lanai, and Oahu as well. However, 4 years later, Kamehameha the Great made his move on Kahekili's domain, and the battle of Kepaniwai, which means "water dam" in reference to Iao Stream, took place. The Maui ruler was defeated. The term Kahului literally means "the winning", and the bay takes this name because Kamehameha gathered his warriors there prior to fighting in Iao Valley.

Early Post-Contact Period

The reign of Kamehameha was intertwined with the increasing presence of foreigners. The arrival of Captain Cook offshore at Kahului Bay in 1778 began the steady flow of outside influences on the indigenous population and environment. The first influx came in the effort to save heathen souls. Missionaries arrived in Wailuku in 1832, and the old religion began to wane under their influence. A girls' seminary (Central Female Boarding School) was established by Rev. Jonathan Green in 1836, and taught young Hawaiian women the language and customs of the foreigners, as well as their religion.

Another influence to bring change was foreign commercialism. The first sugar production in the *ahupua'a* was begun in 1828, when two Chinese merchants established Hungtai Sugar Works. Located in the western portion of the *ahupua'a*, this operation continued for nearly a half century.

By 1845 large herds of cattle roamed the Kahului Isthmus (cattle had been introduced on the Big Island by Vancouver in 1793). The Maui cattle were under royal *kapu*, and were so destructive to the environment that Native Hawaiian landowners protested (Barrere, 1975, p. 52). Brief attempts at the production of cotton in the 1830's met with no commercial success¹, but further impacted the landscape.

¹The Anglican Church felt that "the Hawaiian people, freed from their service to and dependence on the chiefs should be self-supporting and thought that the encouragement of the manufacture of cloth from the superior cotton which grew luxuriantly in the islands would be a means to that end. They therefore suggested that a manufacturer be sent with sufficient machinery to get the project started. They felt that the people would continue to work with the encouragement and cooperation of the chiefs." (Lemmon et. al.,

Post-1850s Period

After the Great Mahele in 1848, the *ahupua'a* was designated as Crown Land, to be used in support of the royal "state and dignity". In 1872 Kamehameha V died, and his sister Princess Ruth Ke'elikolani inherited the land. She was designated as the owner of the Ka'a lands of Wailuku, the southern portion of the *ahupua'a*. A much smaller northern section (391 acres) was awarded to her half-sister, Victoria Kamamalu. Princess Ruth sold one-half of the Crown Lands of Hawaii to Claus Spreckels in 1882, in order to settle her debts with him. Spreckels already held a lease for 16,000 acres of Wailuku *ahupua'a*, dating from 1878. Worried about what Spreckels might do with half of the Crown Lands, King Kalakaua gave him Land Grant 3343, a 24,000 acre portion of the southeastern section of the *ahupua'a*, in return for the surrender of his claim (Adler, 1966, pp. 262-264).

The Reciprocity Treaty of 1876 with the United States had given a boost to the sugar industry by increasing prices. The dry eastern part of the *ahupua'a* would be attractive as potential sugar land if water could be brought to it. In 1880 Spreckels began construction of what was called "Spreckel's Ditch", located *makai* of the Hamakua Ditch built by Alexander and Baldwin earlier, to water Maui Agricultural Company's fields. The "Spreckel's Ditch" brought Haleakala water to the arid Kahului isthmus. The ditch was 30 miles long, and delivered about 60 million gallons of water a day, and cost \$500,000. Spreckels also built another ditch, the Waihe'e ditch in 1882, which tapped the water resources from the West Maui Mountains, thus bringing water to both sides of the Wailuku Commons isthmus area (Adler, 1966, pp. 48-49). This enabled him in 1882, to found Hawaiian Commercial and Sugar Company. He continued involvement in the company until 1898, when control of the company was wrested from his hands. The parent company still bears the name of Alexander and Baldwin, the principal participants in the transfer of corporate control. The production of sugar cane continues to be an activity in the isthmus area to this day.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Although no previous archaeological work has been done on the survey parcel, the lands surrounding it on 3 sides have been recently studied (Donham, 1992; Rotunno-Hazuka, et. al., May 1994a and May 1994b). A table containing a detailed listing of previous archaeological work done in Wailuku *ahupua'a* up to 1992 is included in a

1973, p. 2.B.3). To this end they sent Miss Lydia Brown in 1835 with "a quantity of domestic spinning apparatus' (presumably spinning wheels and a loom)" (Ibid.), and "charged with the responsibility of teaching the Hawaiian girls the arts of carding, spinning, weaving and knitting locally grown cotton and wool." (Ibid.) As each class grew proficient enough to teach others, a new class was formed (Ibid., 2.B.4).

report on the proposed Maui Lani Project area done by Bishop Museum archaeologists (Rotunna-Hazuka, et. al., May 1994b). Map 4 shown the locations of recent archaeological studies.

Earlier studies were concerned with large architectural features, such as *heiau*. Winslow Walker's survey in 1931 mentions 16 *heiau* sites which once existed in the Wailuku/Kahului area, and designates them as Sites 42-57 (Walker, 1931). The only 2 remaining are Haleki'i and Pihana *Heiau*, overlooking Iao Stream and Kahului Bay. Recent archaeological work has been done by Michael Kolb on these *heiau* (Kolb, 1990). He concluded that Pihana *Heiau* was "utilized for the ceremonies pertaining to a *luakini* temple, while Halekii *Heiau* was used as a chiefly residence." (Ibid., p. 7).

Surveys by Barrera (1976) of the 1,000 acre Maui Lani project which surrounds the present study parcel, and of the Hale Laulea Subdivision (Barrera, 1983) in Kahului did not identify any sites. Neller (1984) investigated the area known as the "sand barrow site" after sand from there, used at a construction site in Lahaina, was discovered to contain human remains. His research revealed one complete *in situ* burial, and skeletal fragments of at least 3 other individuals scattered in the vicinity.

In 1987, in response to a call from the Maui Police Department, the present authors visited this same general area to determine the nature of skeletal material reported by local residents. The disturbed, flexed burial of a young female (18 to 25 years of age), and a 4 or 5 year old child nearby, lay partially exposed in a trail used by dirt bikers. At the request of the Police Department, the burials were removed. The presence of a shattered 4th thoracic rib and lower scapula blade on the left side, suggested that a frontal, traumatic puncture wound caused the death of the young female. The remains were curated at Maui Community College until they were turned over to SHPD on Maui for permanent disposition.

In 1990, the Anthropology Department of the Bishop Museum under contract to Maui Lani Partners conducted test excavations on 4 sites which had been identified in a reconnaissance survey done in January 1990 (Rotunno and Cleghorn, February 1990). The sites included 2 parallel alignments, 2 adjacent rock mounds, and a single rock mound. These sites were determined to be of recent origin related to off-road vehicular traffic, and not archaeologically significant. The fourth site (Site 50-50-04-2797) is a human burial site found at a sand borrow pit near the eastern boundary of the Maui Lani project area. No intact burials were recovered, but the scattered remains of at least 3 individuals were recovered in the surface layer (Rotunno-Hazuka et. al., May 1994a). A subsequent burial search was undertaken. These investigations resulted in the identification of at least 12 individuals from 10 burial features. Six features were preserved *in situ* (Rotunno-Hazuka et. al., May 1994b).

While Site 2797 is some distance from the study parcel, the property adjacent to it was found to contain human burials (Site 50-50-04-2916). In May of 1992, skeletal remains were investigated by Theresa Donham. She found the remains of an adult male in a grading cut, roughly 2 feet below the original surface (Burial 1). No cultural materials were associated, and a burial pit could not be identified. On May 21, a cranium (Burial 2) was exposed during construction of a desilting basin located along the lower slope of the dune at the southeastern² corner of the project area (Donham, 1992, p. 3). A test unit measuring 5 by 3 meters was excavated to a depth of 0.50 to 0.75 meters below the surface. All sand material was screened and a total of 280 identifiable elements or fragments were recovered, along with 235 miscellaneous fragments. Two individuals were represented, an adult female, and a smaller adult individual of undetermined sex.

Another series of burials was encountered at a sand mining operation located ca. 1 km. to the south, at the Maui Scrap Metal Company in Waikapu. Sand from the site was transported to Lahaina for use at the Sewer Plant, and was found to contain human remains. Their origin was established, and for a period of several months, from November 1994 to March of 1995, sand material was screened by a large mechanical sifter in an effort to recover the human remains disturbed by the sand mining activities. The burial site bears the number 50-50-04-3525. A minimum number of 22 individuals were dislocated by sand mining activity, and were reinterred at the site by members of the Maui and Lanai Islands Burial Council in early March, 1995. The site is to be fenced and preserved as a burial site (Fredericksen, et. al., report being prepared).

Xamanek Researches conducted a subsurface archaeological inventory survey at Maui Memorial Park in June of 1994. No significant subsurface or surface materials were found. A portion of an intact dune exists on the property, and monitoring was recommended at the time it is removed, due to the possibility that it might contain human burials (Fredericksen, et.al., 1994).

Settlement Patterns

The archaeological and historical information on the *ahupua'a* of Wailuku suggests that the permanent settlements were located along the coast line, in association with fish ponds and *heiau*. The coastal areas provided rich marine resources. An inventory survey (Fredericksen, et. al., 1992) and data recovery work at a precontact coastal site, on property to be used for the Nisei Veterans Memorial Center, has produced extensive midden deposits, fire pits, human burials, and numerous artifacts ranging from adzes, hammerstones, canoe abraders, coral files and fishhooks (Fredericksen, et. al., in process of preparation). The site (Site 3120) stretches over 200 meters along the dune

²According to Figure 3 (Donham, 1992) the desilting basin is located on the southeastern corner of the property, rather than the southwestern as stated on page 3. This basin extends to the border shared by the Homeless Shelter and the present study property.

below the old Kahului Railroad Bed. Radiocarbon dating established the continuous occupation of the site as being from ca. the 13th century to mid-18th century.

Nearby Iao Valley contains *lo'i* and *'auwai*, in which agricultural products were grown during precontact times, and made it another rich resource area within the *ahupua'a*.

However, given the arid climate and poor soil conditions in the present study area location, one would not expect large permanent settlements. Indeed, none of the archaeological studies conducted in the immediate environs have produced midden or architectural features suggesting habitation activities. On the other hand, the literature is replete with references to human burials, making the likelihood of their occurrence on the subject parcel quite high.

ARCHAEOLOGICAL FIELD METHODS

The archaeological inventory survey was conducted in two phases. A pedestrian survey covering 100% of the study area was first performed by field crew members spaced at c. 5 m. intervals. Ground visibility was poor due to dense alien grass cover. The c. 15 acre property was transected along roughly N-S lines. Flagging tape was used to mark sweep corridors in most of the densely vegetated portions of the project area. During this first phase of the inventory survey, no surface evidence of significant cultural resources was encountered. It became evident during the pedestrian survey that the project area consists of two sand dunes, exposed lithified sand along the "ridges" of the dunes, and deposits of sand. No surface evidence of non-sandy soils was encountered.

The second portion of the inventory survey consisted of subsurface testing. A total of 43 backhoe trenches (BT), 21 auger tests (AT) and 2 manually excavated test units (TU) were completed. All backhoe trenches except BT 37 were c. 5 m. in length by 0.8 m. in width and ranged in depth from 0.3 to 4.8 mbs. Initially, BT 37 was the same size as the other trenches. However, it was expanded to c. 1.6 m. in width in order to more safely investigate a charcoal stained sand layer. Backfill from all trenches was visually inspected and spot checked with 1/8 inch mesh screen and trench profiles were visually inspected. The 21 manual auger tests were 8 cm. in diameter and ATs 1 through 19 ranged in depth from 0.8 mbs to 1.1 mbs. Auger Tests 20 and 21 were placed in TUs 1 and 2 and began at 0.9 mbs and extended an additional 1.1 m. All soil from the auger cores was screened through 1/8 inch mesh hardware cloth. The two manually excavated test units were both dug to 0.9 mbs. Unit dimensions were 1 m. square for TU 1, and 0.5 m. by 1.0 m. for TU 2. All soil was screened through 1/8 inch hardware cloth and both test units were excavated in 10 cm. levels. Simplified profile drawings (idealized) were produced by using standard measuring and recording techniques.

ARCHAEOLOGICAL FIELD RESULTS

The pedestrian survey yielded no surface evidence of significant cultural resources. Of note are 2 sizable sand dunes that cross the subject parcel in a roughly N-S direction. The western most sand dune has had its western flank removed by Waiale Road. This dune is c. 7 to 9 m. high. The eastern dune is intact on the subject parcel and rises to c. 10 to 12 m. above its flanks. Both dunes have exposed lithified sand along their "ridges". In general, there was little visible surface evidence of modern activity on the subject property other than the recent soil analysis clear areas. However, portions of the southeastern quadrant of the survey area contained modern debris including wrecked automobiles, tires, and refuse. In addition, a former HC & S Company access road cuts across the eastern portion of the property. Finally, a buried 18 inch cast iron water line crosses the subject parcel in a roughly N-S manner between the two sand dunes.

The subsurface testing phase of the inventory survey consisted of 43 backhoe trenches (BT), 21 auger tests (AT) and 2 manually excavated test units (TU). All but 3 of the backhoe trenches were excavated to undisturbed lithified sand. It was not possible to excavate BT 14 to lithified sand because of unstable trench conditions. Backhoe Trenches 37 and 39 were excavated well into sterile sand before the units were terminated. In general, lithified sand was encountered at depths as little as c. 0.3 mbs near the sand dune "ridges" and as deep as 4.8 mbs along the dune flanks.

No evidence of *in situ* cultural deposits was located during subsurface testing on the subject property. Stratigraphy in the majority of the subsurface tests was simple and consisted of two basic soil layers. Layer I was composed of loamy sand which was very pale brown (10 YR 7/4) and contained low amounts of humus. This layer was sterile and ranged from c. 0.1 m. to 0.6 m. thick in tested areas. Layer I was underlain by clear, yellow (10 YR 8/6) sand. Layer II was sterile and ranged from c. 0.2 m. to over 4 m. in thickness in sampled portions of the study area. This sand layer typically terminated at lithified sand which was located c. 0.3 mbs to 4.8 mbs in tested areas of the parcel. This yellow sand layer also occurred under other soil layers in the remaining subsurface tests except BT 37 and 39. In these two units, white (10 YR 8/2) sand was present to the bottom of the excavations. Evidence of an ephemeral stream was located in BT 14 and in ATs 6, 7, 8 and 9. Stream gravels and waterworn cobbles were present along with brown (7.5 YR 5/2) sandy alluvium. This ephemeral stream appears to have flowed between the two sand dunes. This stream bed was underlain by the common yellow (10 YR 8/6) sand mentioned earlier. A brief discussion of subsurface test results follows below. Refer to Table 1 for a summary of backhoe trench test results, Table 2 for a summary of auger test results, and Appendix A for representative stratigraphic descriptions. See Map 3 for locations backhoe tests, auger tests, and test units. The term "idealized" on the trench profiles is used as a synonym for "simplified". Soil layers represent the major stratigraphic differences present in the tests. In all cases, strata contained no cultural materials.

Backhoe Trench 1 (Figure 1)

This trench was excavated in the northeastern quadrant of the property about 40 m. east of Waiale Road and c. 50 m. south of the County of Maui Ka Hale A Ke Ola Homeless Resource Center. Trench dimensions were 5.0 m. long by 0.8 m. wide by 0.8 m. deep. Unit orientation was approximately E-W. This first trench was located on the side of the western sand dune that is present on the subject parcel. Lithified sand was visible near the "ridge" of this dune c. 15 m. to the west and BT 1 was placed on the slope in order to investigate subsurface conditions. Two soil layers were encountered before very hard lithified sand caused excavation to be abandoned at c. 0.8 mbs (Figure 1).

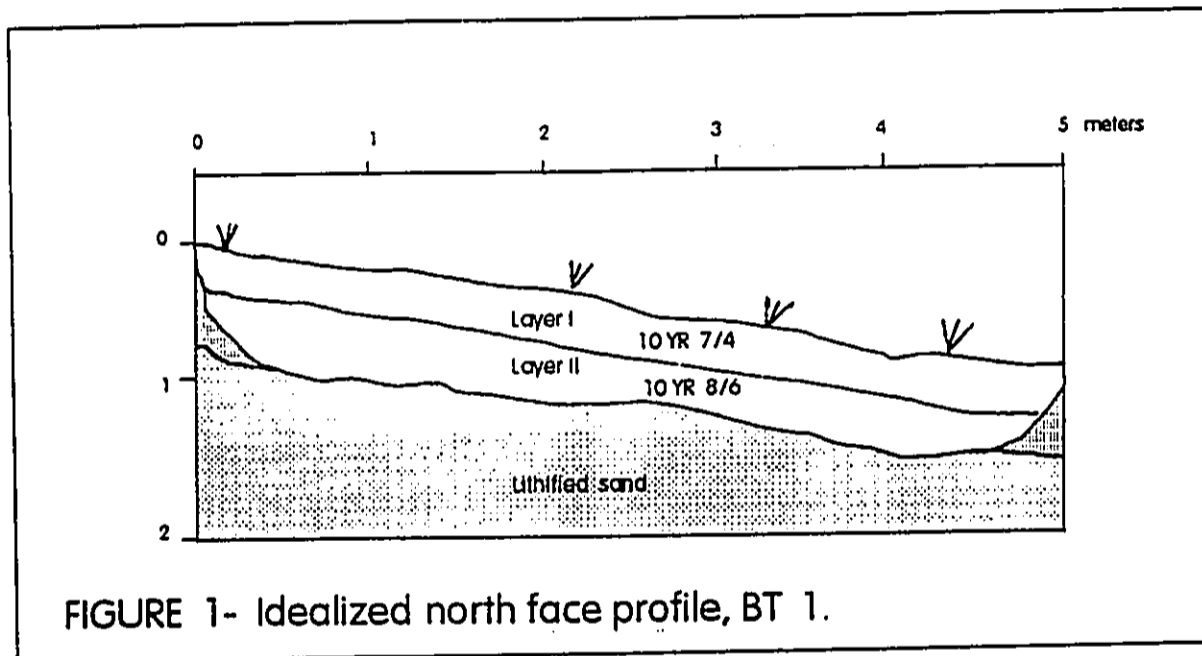


FIGURE 1- Idealized north face profile, BT 1.

Layer I consisted of very pale brown (10 YR 7/4) loamy sand. This layer contained small amounts of humus and was c. 0.3 m. thick. Visual inspection of back dirt and spot checking with 1/8 inch screen indicated that this layer does not contain cultural material. Layer II consisted of yellow (10 YR 8/6) sand that appeared to be sterile. This sand layer was about 0.5 m. thick and overlaid undisturbed lithified sand. There was no evidence of *in situ* cultural materials encountered in BT 1. It appears that this portion of the dune is undisturbed. Stratigraphy encountered in BT 1 is representative of the bulk (83%) of the backhoe trenches placed on the subject parcel.

Backhoe Trench 2 (Figure 2)

This trench was excavated about 5 meters downslope and east from BT 1 and oriented E-W. Unit dimensions were c. 5.0 m. long by 0.8 m. wide by 2.0 m. deep. Subsurface investigation revealed a total of 4 sand layers before excavation was terminated at lithified sand c. 1.8 to 2.0 mbs (Figure 2).

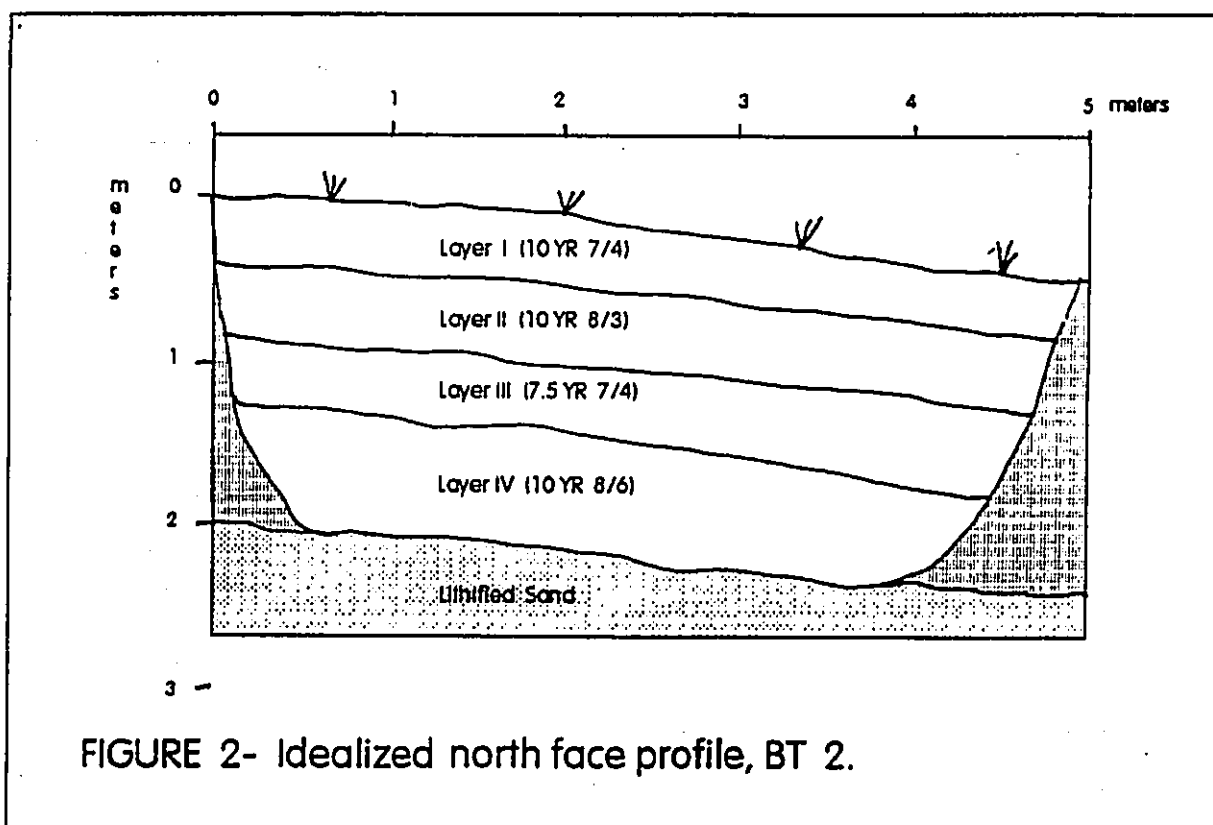


FIGURE 2- Idealized north face profile, BT 2.

Layer I (0 to 0.4 mbs) consisted of very pale brown (10 YR 7/4) loamy sand. This layer is the same as the humus containing Layer I in BT 1. Layer I in BT 2 was also sterile. It was underlain by white (10 YR 8/2) sand. This Layer II (0.4 to 0.8 mbs) sand was also sterile. A pink (7.5 YR 7/4) sand layer (Layer III) occurred under Layer II and extended from c. 0.8 to 1.2 mbs. Layer III did not appear to contain cultural materials. Layer IV yellow (10 YR 8/6) sand was the same as Layer II in BT 1. Layer IV was also sterile.

As in BT 1, there was no evidence of *in situ* cultural deposits located in BT 2. There were also no indications that there had been any subsurface disturbances in this

part of the study area. The unit profile for BT 2 serves as a representative profile for BTs 5 and 43.

Backhoe Trench 3

This test was located c. 20 m. south of BT 1 and was oriented E-W. Trench dimensions were 5.0 m. long by 0.8 m. wide by 0.6 m. deep. Stratigraphy encountered was similar to that found in BT 1 (see Figure 1). Layer I (0 to 0.3 mbs) was composed of very pale brown (10 YR 7/4) sand that contained humus. Layer II extended to very hard lithified sand at c. 0.6 mbs. This layer consisted of yellow (10 YR 8/6) sand. No evidence of material culture remains or disturbance was encountered in BT 3. No profile was drawn for this trench.

Backhoe Trench 4

Backhoe Trench 4 was oriented E-W and was located c. 5 m. downslope and east of BT 3. Stratigraphy was similar to that encountered in BTs 1 and 3 (see Figure 1). However, sand deposits were thicker. Unit dimensions were c. 5 m. long by 0.8 m. wide by 1.5 m. deep. Layer I consisted of the common very pale brown (10 YR 7/4) loamy sand layer. This layer was about 0.4 m. thick and did not contain any *in situ* cultural deposits. Layer II was composed of the common yellow (10 YR 8/6) sand that overlaid lithified sand in nearly all subsurface test instances. Layer II extended from c. 0.4 mbs to 1.5 mbs and also appeared to be sterile. No unit profile was prepared.

Backhoe Trench 5

This trench was placed about 20 m. south of BT 4 and oriented E-W on the dune slope. Dimensions of BT 5 was c. 5 m. long by 0.8 m. wide by 1.3 m. deep. Stratigraphy encountered was similar to BT 2 (see Figure 2). In all, 4 sand layers were encountered. Layer I (0 to 0.3 mbs) consisted of the common very pale brown (10 YR 7/4) loamy sand that was present in all sampled undisturbed portions of the subject property. This layer was c. 0.3 m. thick and was sterile. Layer II (0.3 to 0.7 mbs) consisted of white (10 YR 8/2) sand that was also sterile. This white sand overlaid pink (7.5 YR 7/4) Layer III (0.7 to 0.85 mbs) sand. This layer appeared to be sterile, and it was underlain by the common yellow (10 YR 8/6) sand that rests on lithified sand. This sterile, yellow Layer IV sand extended to about 1.3 mbs and excavation was terminated at very hard lithified sand. No trench profile was recorded.

Backhoe Trenches 6 through 13

These 8 trenches were placed along the slopes of the two dunes and all contained the common site stratigraphy found in over 80% of the backhoe trenches. All trenches were c. 5 m. long by 0.8 m. wide and ranged in depth from 0.5 mbs to 2.9 mbs. Unit

orientation for these backhoe trenches was E-W. Two common sand layers were located in each of these trenches and all units except BT 13 were sterile. Backhoe Trench 13 contained one piece of metal strapping in the top of Layer I and the rest of this stratum was sterile.

Layer I consisted of the very pale brown (10 YR 7/4) loamy sand which contained low amounts of humus. Layer I ranged in depth from c. 0.2 to 0.5 m. thick. This sand layer did not yield any *in situ* cultural deposits. With the exception of BT 13, none of the trenches produced any modern materials.

Layer I was underlain by the common Layer II yellow (10 YR 8/6) sand. This sand stratum did not produce any evidence of material culture remains. Layer II ranged from 0.3 to 2.4 m. thick and overlaid extremely hard lithified sand. In general, units placed further up the slope of either dune contained shallower sand deposits. No unit profiles were prepared.

Backhoe Trench 14 (Figure 3)

This unit was located c. 15 m. northwest of BT 13, near a temporary access road. This bulldozed road was placed between the two dunes during a previous soil engineering

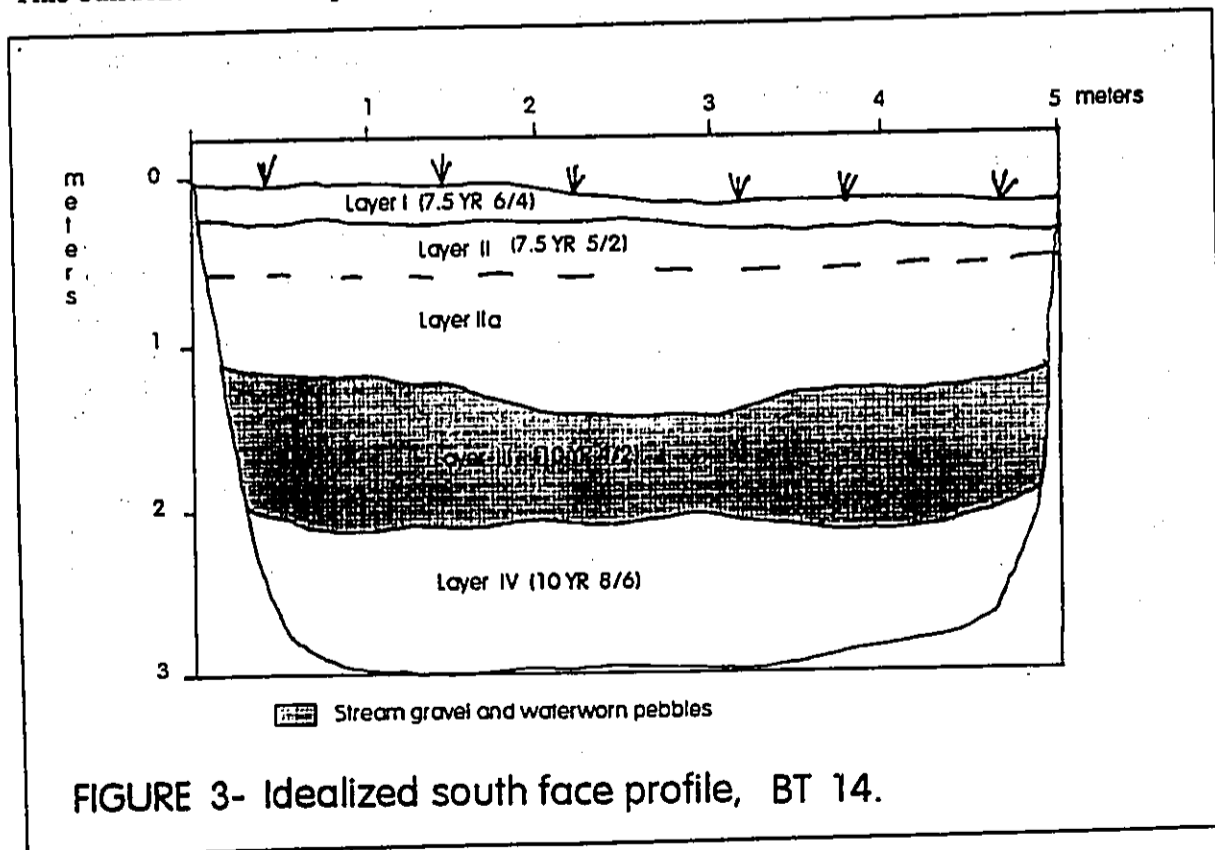


FIGURE 3- Idealized south face profile, BT 14.

study. An auger test (AT 6) by Xamanek Researches indicated that alluvial deposits were near this access road. Backhoe Trench 14 was excavated c. 3 m. north of AT 6 to further investigate subsurface conditions. Trench dimensions were c. 5 m. long by 8.8 m. wide by 2.9 m. deep and orientation was E-W. Four soil layers were encountered before excavation was halted (Figure 3).

Layer I (0 to 0.2 mbs) consisted of disturbed, light brown (7.5 YR 6/4) loamy sand. This sterile layer was likely impacted by the bulldozed access road. Layer II (0.2 to 1.1 mbs) was composed of brown (7.5 YR 5/2) alluvium that did not have any *in situ* cultural materials associated with it. This alluvial deposit was underlain by Layer III (c. 1.1 to 1.5 mbs). This stratum was composed of alluvium, stream gravels and waterworn pebbles that was brown to dark brown (10 YR 4/2). Several kukui nut shells were located in Layer III. However, they appeared to have been water deposited. Layer III was underlain by the common yellow (10 YR 8/6) sand that was present in all other subsurface tests except BTs 37 and 39. Layer IV extended from c. 1.5 mbs to the bottom of BT 14 at 2.9 mbs. Excavation was halted when broken fragments of lithified sand were encountered and part of the trench collapsed.

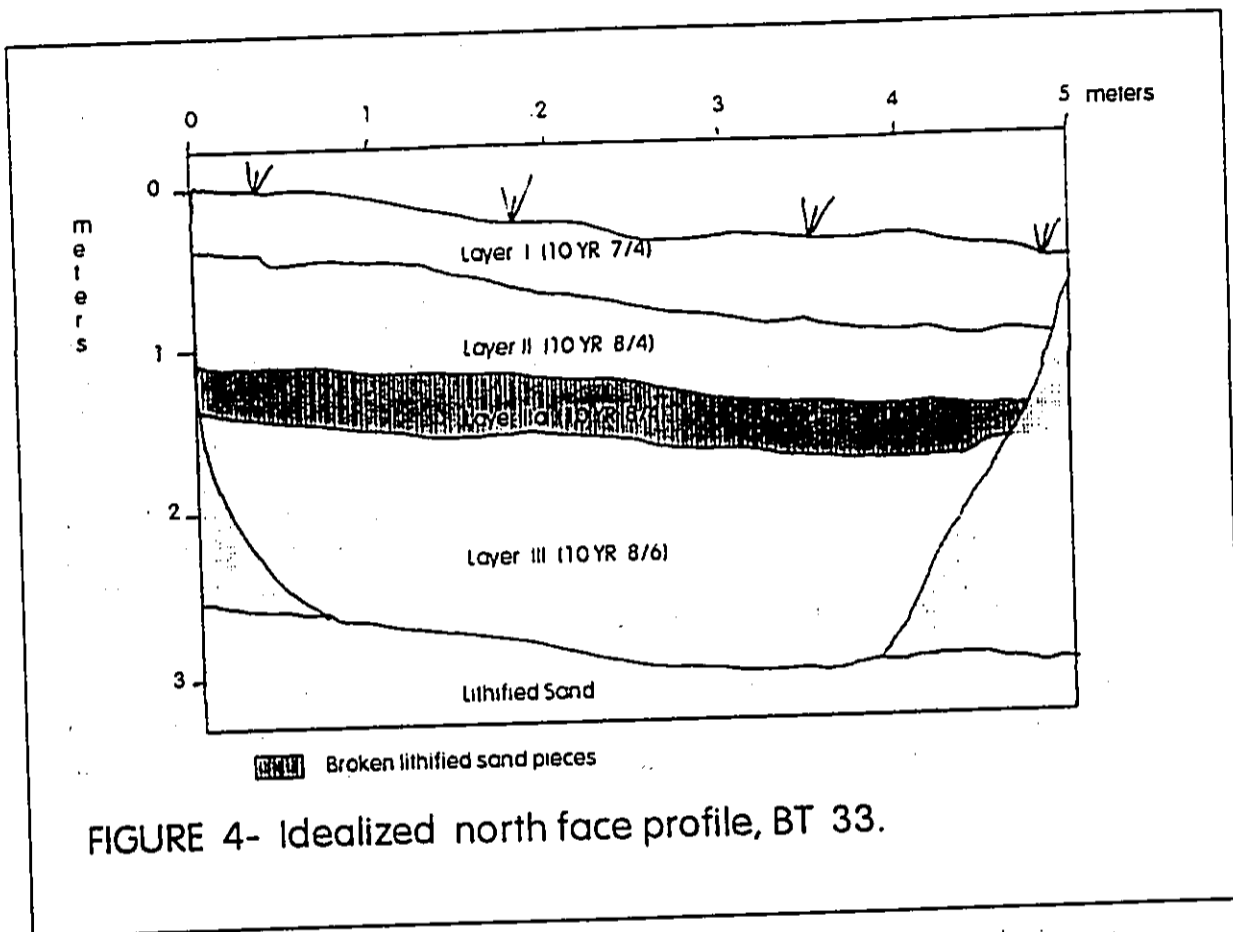
It appears that this portion of the subject property contains the bed of an ephemeral stream. Three additional auger tests--ATs 7, 8 and 9 also produced alluvial deposits similar to those located in AT 6 and in BT 14. This natural drainage area is in the trough between the sand dunes.

Backhoe Trenches 15 through 32

These 18 trenches were placed on the eastern dune and contained stratigraphy common to most of the sampled portions of the study area. All of these subsurface tests were c. 5 m. long by 0.8 m. wide and ranged in depth from 0.8 mbs to 4.8 mbs. Unit orientation for most of these trenches was E-W. The two common sand layers present in the bulk of the backhoe trenches were located in each test and all units were sterile.

Layer I consisted of the very pale brown (10 YR 7/4) loamy sand which contained low amounts of humus. Layer I ranged in depth from 0.2 mbs to 0.5 mbs. None of the units yielded any evidence of *in situ* cultural materials.

Layer I was underlain by the common Layer II yellow (10 YR 8/6) sand. This sand stratum was also sterile. Layer II ranged in thickness from 0.5 m. to 4.3 m. This sand layer overlaid extremely hard lithified sand. Typically, units placed further upslope on the dune contained shallower sand deposits. Exposed lithified sand was often visible along the peak of this relatively heavily vegetated sand dune.



Backhoe Trench 33 (Figure 4)

This trench was placed c. 20 m. east of the former HC & S Co. access road that is present relatively near the subject property's eastern boundary. This trench's dimensions were c. 5 m. long by 0.8 m. wide by 2.8 m. deep. Three sterile soil layers were identified in this unit (Figure 4) before lithified sand was reached c. 2.6 to 2.8 mbs.

Layer I (0 to 0.4 mbs) consisted of the common very pale brown (10 YR 7/4) loamy sand found in all undisturbed sampled areas. This stratum did not contain any *in situ* cultural layers. It was underlain by a very pale brown (10 YR 8/4) sand layer which contained broken pieces of lithified sand. Layer II (0.4 to 1.3 mbs) contained concentrations of pieces of lithified sand between c. 1.0 to 1.3 mbs. Layer III (1.3 to 2.8 mbs) consisted of the common yellow (10 YR 8/6) sand that overlays lithified sand in nearly all sampled areas. As noted earlier, no evidence of cultural material was observed in this unit.

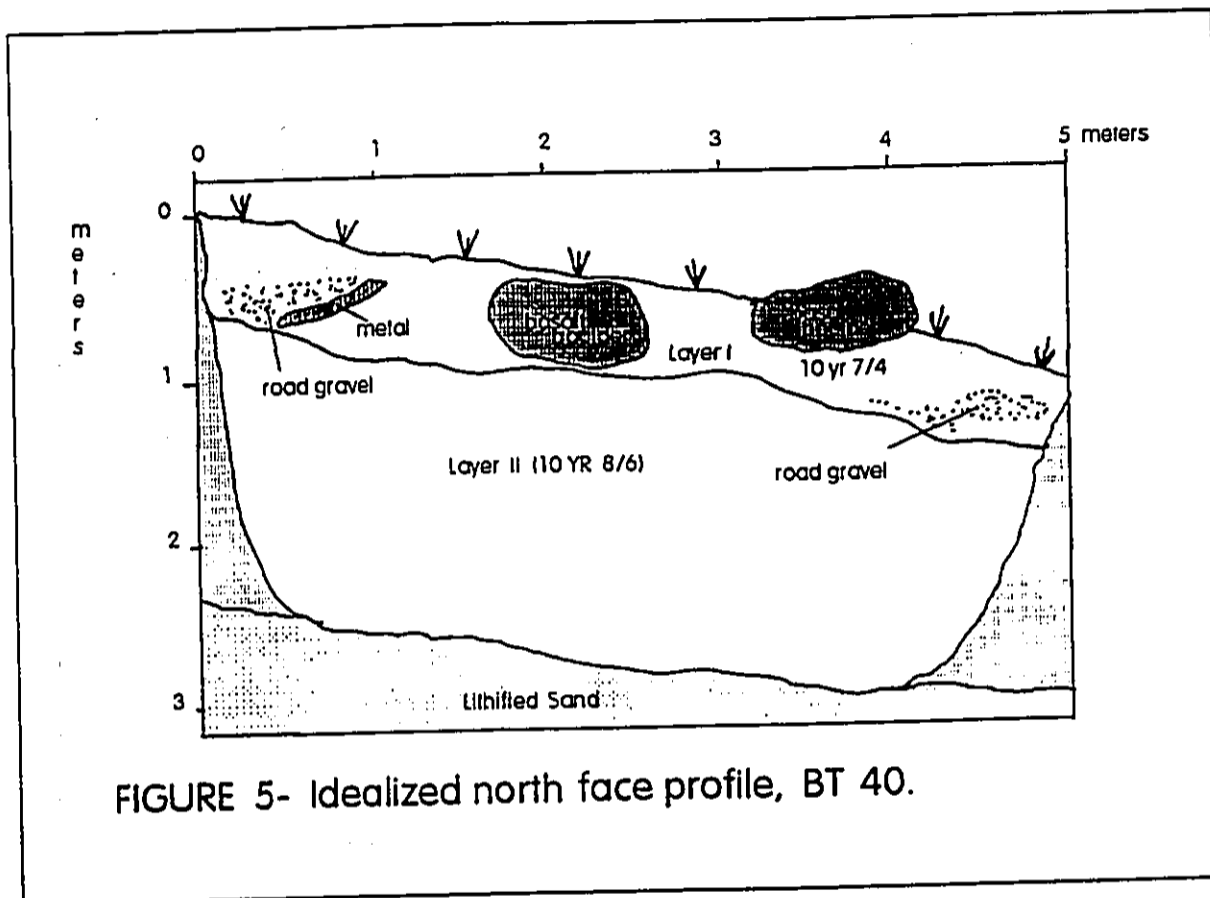


FIGURE 5- Idealized north face profile, BT 40.

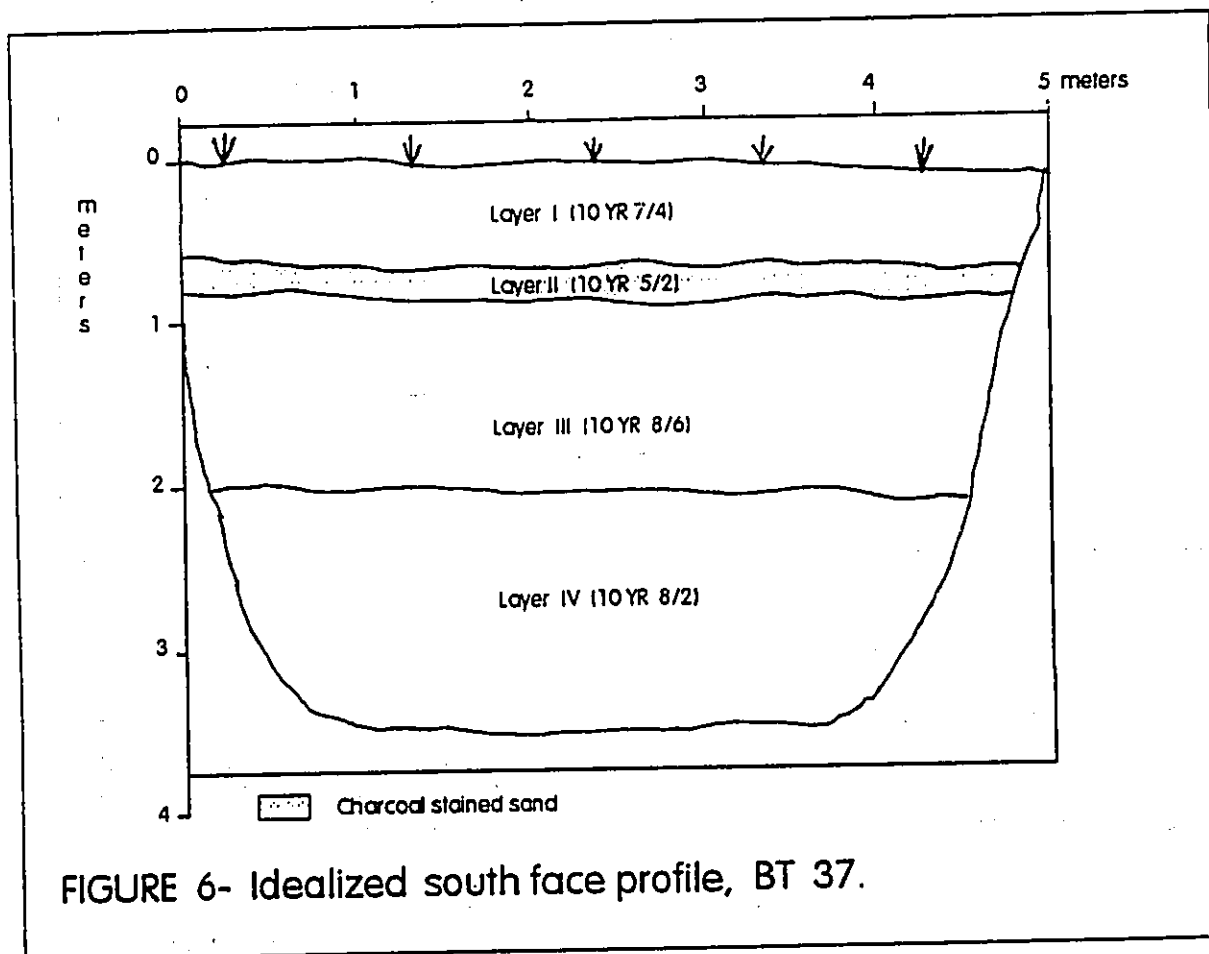
Backhoe Trenches 34 to 36, 38, and 40 to 42 (Figure 5)

These 7 subsurface tests were excavated on various portions of the eastern half of the study area. Stratigraphy was again representative of trenches that contained the 2 common sand layers in tested portions of the study area. All trenches except BT 40 were sterile. Backhoe Trench 40 contained road gravel and metal in Layer I (Figure 5).

Layer I in these units consisted of the common very pale brown (10 YR 7/4) loamy sand that was present in nearly all subsurface test instances. Layer I ranged in thickness from 0.1 to 0.6 mbs. It was underlain by the common yellow (10 YR 8/6) sand Layer II. This sterile stratum ranged from a thin 0.2 m. in BT 41 near the eastern dune ridge to a thick of 3.7 m. near the base of the dune in BT 35. All trenches were excavated to lithified sand and no unit profiles were prepared.

Backhoe Trenches 37 and 39 (Figure 6)

These trenches both contained a charcoal stained sand layer that was not located in other backhoe trenches. However, a similar charcoal stained sand layer was encountered in both TU 1 and TU 2. A total of 4 sterile sand layers were present in each trench (see Figure 6). Dimensions for BT 37 were c. 5 m. long by 1.6 m. wide by 3.4 m. deep and c. 5 m. long by 0.8 m. wide by 2.8 m. deep for BT 39. No profile was prepared for BT 39.



Layer I consisted of the common very pale brown (10 YR 7/4) loamy sand. This layer was up to 0.6 m. thick and contained no cultural materials. It was underlain by Layer II which was composed of charcoal stained grayish brown (10 YR 5/2) sand c. 0.1 to 0.2 m. thick.

While the Layer II sand lens contained charcoal staining, no evidence of cultural materials was uncovered from an informal 0.3 m. deep shovel test placed in Layer II in

BT 37 prior to the resumption of unit excavation. All soil from the shovel test (c. 0.4 by 1.0 m.) was screened through 1/8" screen. This layer was also present in BT 39, although it was only about 0.1 m. thick. An additional, informal shovel test was placed in Layer II of BT 39 and was also sterile. It may be possible that this charcoal stained sand layer represents former brush fire activity in the area.

Layer III was about 1.3 m. thick and consisted of the common yellow (10 YR 8/6) sand present in all other trench tests. However, this sterile stratum did not overlay lithified sand. Rather, Layer III overlaid a white (10 YR 8/2) sand layer. Layer IV appeared to be sterile. This white sand was very fine textured and did not contain any signs of cultural materials. Large pieces of lithified sand were located below c. 2.6 mbs in BT 37 and near the bottom of BT 39 and excavation was halted in each trench.

Backhoe Trench 43

This was the last trench excavated at the study area. It was placed in the northwestern quadrant of the subject parcel c. 25 m. south of the boundary with the Ka Hale A Ke Ola Homeless Resource Center and c. 30 m. east of Waiale Road. Trench dimensions were c. 5 m. long by 0.8 m. wide by 1.5 m. deep. A total of 4 sterile sand layers similar to those found in BT 2 and BT 5 were encountered (see Figure 2).

Layer I (0 to 0.4 mbs) was composed of the common very pale brown (10 YR 7/4) loamy sand found in all test instances in undisturbed areas. It was underlain by white (10 YR 8/2) sand. Layer II (0.4 to 0.9 mbs) sand had little organic matter in it. Layer III (0.9 to 1.1 mbs) consisted of a pink, dry sand layer. This pink stratum was underlain by the common yellow (10 YR 8/6) sand stratum. Layer IV extended c. 0.4 m. to lithified sand at 1.5 mbs. No trench profile was prepared for BT 43.

Auger Tests

Auger cores were not utilized extensively on the study area for two basic reasons. First, subsurface testing with the backhoe revealed generally deep (i.e. c. 75% of trenches greater than 1.2 mbs) deposits of sand. Secondly, there was no *in situ* evidence of cultural material located in any of the BTs. In general, auger tests were utilized to investigate subsurface conditions in areas not readily accessible by the backhoe and to further explore differences in subsurface stratigraphy such as the ephemeral stream discussed above. As with the backhoe trenches, none of the auger cores produced any evidence of material culture remains.

Auger Tests 1 and 5

These 2 auger tests were placed in the northwestern quadrant of the study area along the bulldozed access road that roughly parallels Waiale Road and runs between the sand dune. Three sand layers were encountered before the maximum auger depth of 1.1 mbs was reached. All sand layers were sterile. Layer I consisted of the common surface sand layer that contains low to moderate amounts of humus. This very pale brown (10 YR 7/4) layer was c. 0.3 m. thick. It was underlain by a sterile charcoal stained sand layer c. 0.1 m. thick. This light brownish gray (10 YR 6/2) Layer II did not appear to contain any small pieces of charcoal. Layer III consisted of the common yellow (10 YR 8/6) sand that overlaid lithified sand in 95% of the backhoe test trenches placed on the study area. Test Unit 1 was located c. 1m. north of AT 1 in order to further investigate the charcoal stained sand layer.

Auger Tests 2, 3, 4 and 10 through 19

These auger tests were placed in various parts of the survey area where surface conditions generally excluded the use of backhoe. None of these 13 tests produced any evidence of cultural materials. All auger cores reached 1.1 mbs except for ATs 15, 16 and 18. Both ATs 15 and 18 ended at lithified sand at 0.8 mbs and 0.9 mbs, respectively. Auger Test 16 was terminated at 0.9 mbs when a root was struck. The 2 common sand layers were present in all 13 of these subsurface tests. Layer I very pale brown (10 YR 7/4) sand ranged from 0.2 to 0.4 m. thick and Layer II yellow (10 YR 8/6) sand was present to the bottom of all auger cores.

Auger Tests 6, 7, 8 and 9

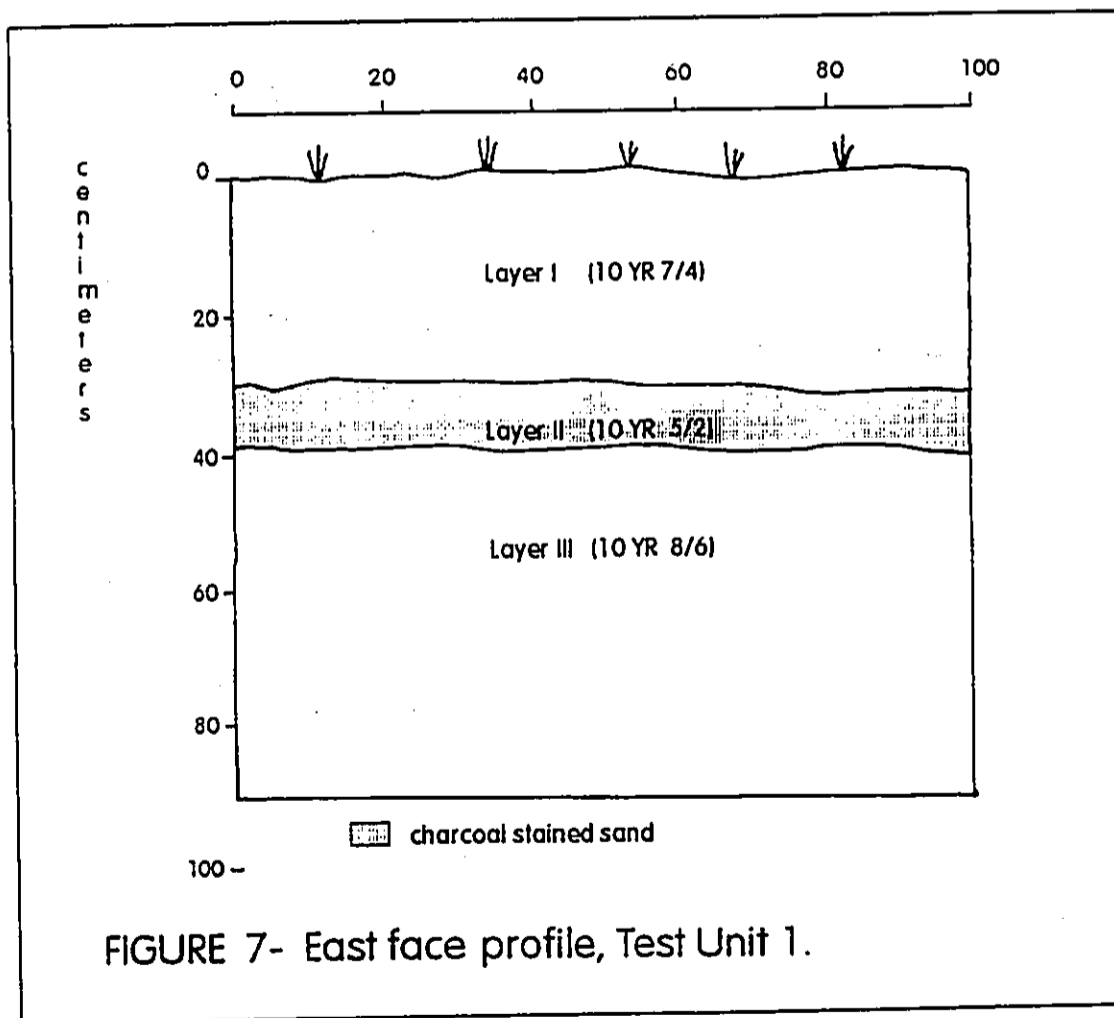
These 4 auger tests were placed along the side of the bulldozed access road that parallels Waiale Road and goes between the 2 sand dunes present on the survey area. All 4 auger tests revealed subsurface deposits that indicated that an ephemeral stream crossed this portion of the study area in a roughly N-S direction in the past. None of the tests yielded any cultural materials. Auger Test 6 was cored downslope of BT 13 and revealed the common very pale brown (10 YR 7/4) surface sand layer that was c. 0.2 m. thick. A brown (7.5 YR 5/2) alluvial layer occurred under Layer I and extended to the bottom of the core at 1.1 mbs. Auger Tests 7, 8 and 9 were placed along the margin of the access road and also revealed alluvial soil deposits. The common yellow (10 YR 8/6) sand occurred under alluvial deposits that were about 0.6 m. thick in ATs 7 and 9. In addition to the brown (7.5 YR 5/2) alluvial deposits contained in ATs 6, 7 and 9, AT 8 also contained a layer of stream gravels and waterworn pebbles. This brown to dark brown (7.5 YR 4/4) stratum was similar to the one located in BT 14 which was excavated c. 60 m. to the south.

Auger Tests 20 and 21

Each of these cores was placed in the bottom of a manual test excavation in order to obtain additional subsurface information. Both auger tests revealed only the common yellow (10 YR 8/6) sand to the 1.1 m. maximum reach. Auger Test 20 was placed in TU 1 beginning at the floor of the unit 0.9 mbs. Auger Test 21 was placed in the floor of TU 2, beginning at 0.9 mbs. Both cores were sterile.

Test Units

As mentioned earlier, 2 manually excavated test units were placed on the study area. Neither unit produced any evidence of material culture remains. Both units were excavated to 0.9 mbs. In addition, Auger Test 20 was placed in the bottom of TU 1 and AT 21 was cored in the bottom of TU 2.



Test Unit 1 (Figure 7)

This 1 meter square unit was located in the northwestern quadrant of the study area near AT 1. Three sterile sand layers were encountered (Figure 7). Layer I (0 to 0.33 mbs) consisted of the common very pale brown (10 YR 7/4) sand. This stratum was underlain by a lightly charcoal stained Layer II. This grayish brown (10 YR 5/2) sand layer extended to c. 0.42 mbs. This stratum appeared to only contain charcoal staining. Layer III consisted of the common yellow (10 YR 8/6) sand that extended to the bottom of TU 1 at 0.9 mbs. As noted earlier, AT 20 was cored in the bottom of TU 1 and produced only Layer III yellow sand to the 1.1 m. maximum reach (i.e. AT 20 cored to 2.0 mbs).

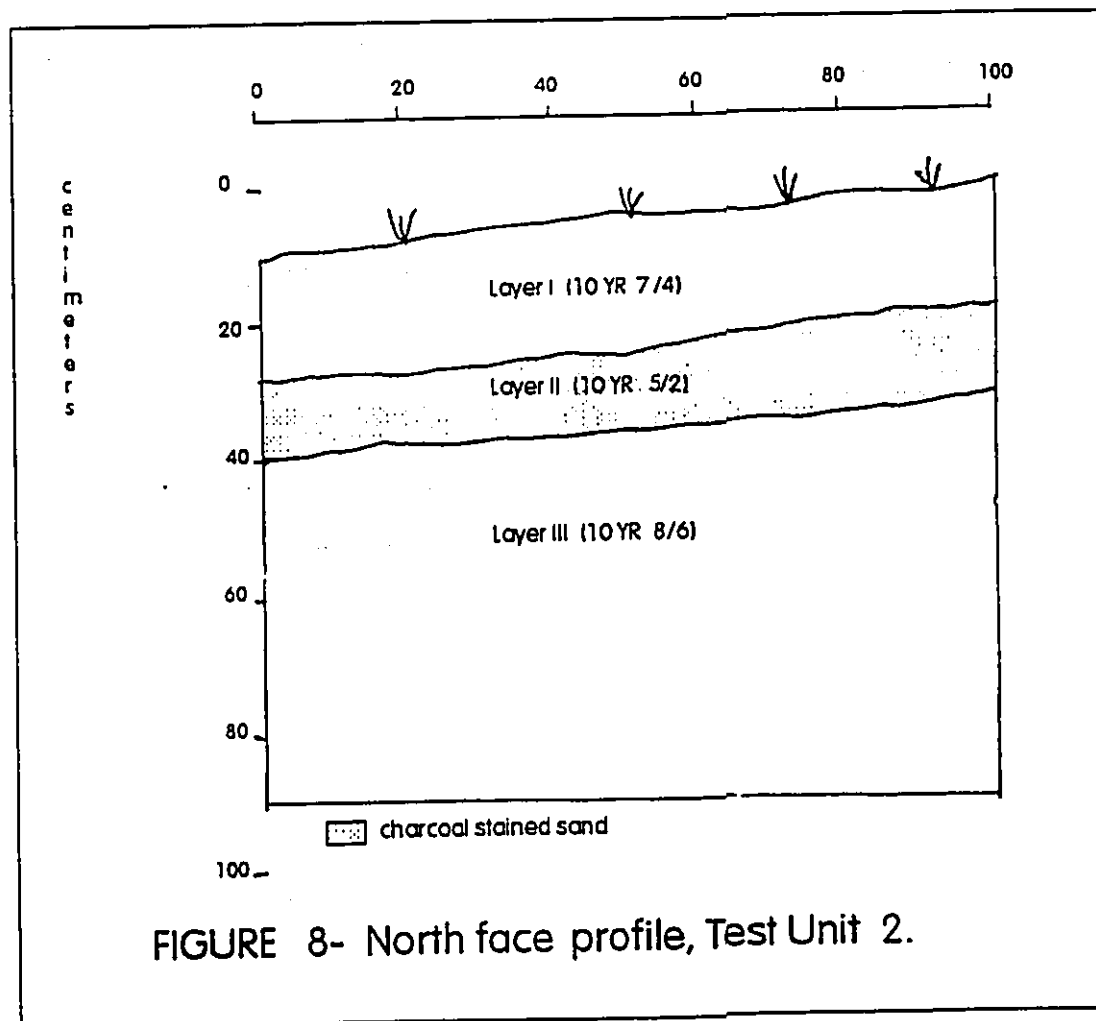


FIGURE 8- North face profile, Test Unit 2.

Test Unit 2 (Figure 8)

This unit was located in the northeastern quadrant of the subject parcel in an area cleared for an earlier soil survey. Three sterile soil layers similar to those found in TU 1 were encountered in this 0.5 m. by 1.0 m. unit (Figure 8). Layer I (0 to 0.30 mbs) consisted of the common very pale brown (10 YR 7/4) sand. It was underlain by grayish brown (10 YR 5/2) Layer II (0.3 to 0.4 mbs) sand. The common yellow (10 YR 8/6) Layer III extended to the bottom of TU 2 at c. 0.9 mbs. Auger Test 21 was placed in the bottom of the unit and cored 1.1 m. Only Layer III yellow sand was present in AT 21 which extended to 2.0 mbs.

SUMMARY AND CONCLUSIONS

The pedestrian portion of the archaeological inventory survey located no surface evidence of significant cultural resources on the subject parcel. The southeastern quadrant of the c. 15 acre study area contains several abandoned automobiles and other modern refuse. In addition, a bulldozed access road, cleared soil core sites for a recent soils study, and an old HC & S access road are the only surface evidence of recent disturbances on the survey area. Stable vegetative cover and exposed, intact lithified sand formations indicate that the two large sand dunes that cross the survey area in a roughly N-S manner have generally not been heavily disturbed in the past. The one exception is the disturbance associated with the laying of the 18 inch cast iron water line that crosses the property roughly N-S in the trough area between the two sand dunes.

The subsurface portion of the inventory survey consisted of 43 backhoe trenches, 21 auger tests and 2 test units. There was no *in situ* evidence of historic or indigenous cultural deposits encountered in any of the above tests. Subsurface findings indicate that the bulk of sampled areas have not been heavily disturbed in the past. Evidence of an ephemeral stream that once flowed between the two sand dunes was found in BT 14 and ATs 6, 7, 8 and 9. There were no material cultural remains associated with the subsurface stream bed.

In conclusion, information recovered from sampled areas of the subject parcel indicates that the survey area does not appear to contain any significant subsurface cultural deposits. However, the presence of 3 burials at Site 50-50-4-2916 on the adjacent property to the north and the discovery of numerous burials on the Maui Lani property to the east suggest that isolated burials could be present on the subject property. Given the fact that the entire study area contains sand deposits and two intact sand dunes, monitoring by a qualified archaeologist is recommended for the project area during earth moving activities. If any inadvertent human remains are uncovered, work must halt until

mitigation measures can be determined by the SHPD and the Maui and Lana'i Islands Burial Council.

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TABLE 1

Subsurface Backhoe Trench Test Results

BT #	DEPTH (mbs)	STRATA	RESULTS
1	0.8	Layer (L) I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
2	2.0	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/2) to c. 0.9 mbs. L III sand (7.5 YR 7/4) to c. 1.3 mbs. L IV sand (10 YR 8/6) to lithified sand	All layers sterile
3	0.6	L I sand (10 YR 7/4) to 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
4	1.5	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
5	1.3	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/2) to c. 0.7 mbs. L III sand (7.5 YR 7/4) to c. 0.85 mbs. L IV sand (10 YR 8/6) to lithified sand	All layers sterile
6	1.6	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
7	1.3	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
8	1.5	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
9	1.0	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
10	0.5	L I sand (10 YR 7/4) to c. 0.2 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
11	2.9	L I sand (10 YR 7/4) to c. 0.5 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
12	2.2	L I sand (10 YR 7/4) to c. 0.5 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
13	1.6	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	I piece of metal in L I, L II sterile
14	2.9	L I disturbed sand (7.5 YR 6/4) to c. 0.2 mbs. L II alluvium (7.5 YR 5/2) to c. 1.1 mbs. L III stream gravels and water worn pebbles (7.5 YR 4/2) to c. 1.5 mbs. L IV sand (10 YR 8/6) to bottom	All layers sterile
15	0.8	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
16	4.8	L I sand (10 YR 7/4) to c. 0.5 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
17	1.1	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
18	1.6	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
19	1.3	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
20	1.5	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile

TABLE 1 (cont.)

BT#	DEPTH (mbs)	STRATA	RESULTS
21	0.9	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
22	1.0	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
23	2.5	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
24	2.9	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
25	1.7	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
26	1.7	L I sand (10 YR 7/4) to c. 0.5 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
27	1.5	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
28	1.7	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
29	0.9	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
30	0.9	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
31	1.9	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
32	0.9	L I sand (10 YR 7/4) to c. 0.2 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
33	2.8	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/4) to c. 1.3 mbs. L III sand (10 YR 8/6) to lithified sand	All layers sterile
34	1.7	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
35	4.2	L I sand (10 YR 7/4) to c. 0.5 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
36	0.7	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
37	3.4	L I sand (10 YR 7/4) to c. 0.6 mbs. L II charcoal stained sand (10 YR 5/2) to 0.8 mbs. L III sand (10 YR 8/6) to c. 2.1 mbs. L IV sand (10 YR 8/2) to bottom	All layers including L II sterile
38	2.4	L I sand (10 YR 7/4) to c. 0.5 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
39	2.8	L I sand (10 YR 7/4) to c. 0.5 mbs. L II charcoal stained sand (10 YR 5/2) to c. 0.6 mbs. L III sand (10 YR 8/6) to c. 1.9 mbs. L IV sand (10 YR 8/2) to bottom	All layers including L II sterile
40	2.4	L I sand (10 YR 7/4) to c. 0.6 mbs. L II sand (10 YR 8/6)	L I contains road gravel, L II sterile
41	0.3	L I sand (10 YR 7/4) to c. 0.1 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
42	0.8	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
43	1.5	L I sand (10 YR 7/4) to c. 0.4 mbs. L II sand (10 YR 8/3) to c. 0.9 mbs. L III sand (7.5 YR 7/4) to c. 1.1 mbs. L IV sand (10 YR 8/6) to lithified sand	All layers sterile

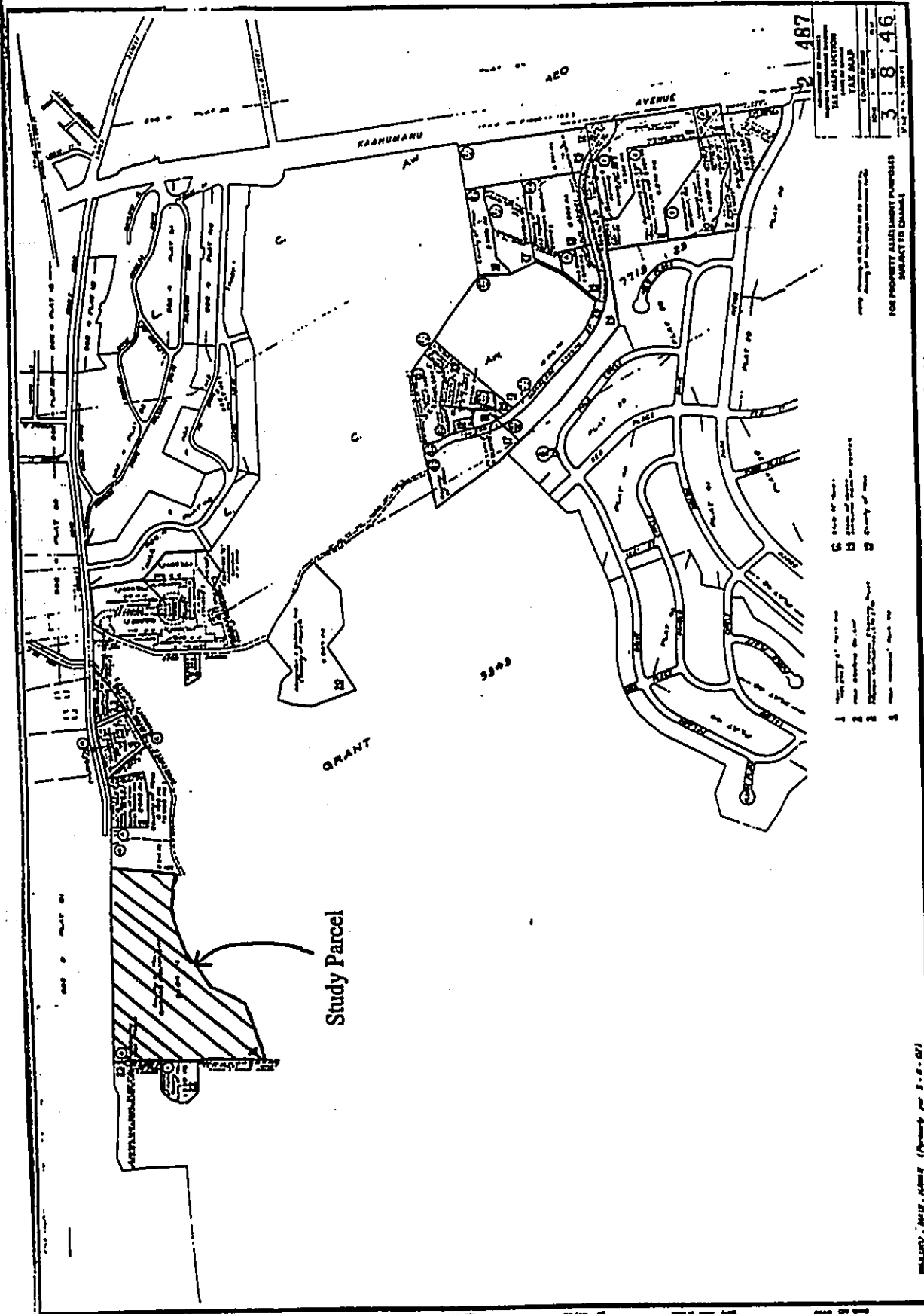
TABLE 2

Subsurface Auger Test Results

AT#	DEPTH (mbs)	STRATA	RESULTS
1	1.1	Layer (L) I sand (10 YR 7/4) to c. 0.3 mbs. L II charcoal stained sand (10 YR 6/2) to c. 0.4 mbs. L III sand (10 YR 8/6) to bottom	All layers sterile
2	1.1	L I sand (10 YR 7/4) to c. 0.2 mbs. L II sand (10 YR 8/6) to bottom	L I and L II sterile
3	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II (10 YR 8/6) to bottom	L I and L II sterile
4	1.1	L I disturbed sand (10 YR 7/2 to 7/4) to 0.4 mbs. L II (10 YR 8/6) to bottom	L I and L II sterile
5	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II charcoal stained sand (10 YR 6/2) to c. 0.4 mbs. L III sand (10 YR 8/6) to bottom	All layers sterile
6	1.1	L I sand (10 YR 7/4) to c. 0.2 mbs. L II alluvium (7.5 YR 5/2) to bottom	L I and L II sterile
7	1.1	L I sand (10 YR 7/4) to c. 0.2 mbs. L II alluvium (7.5 YR 5/2) to c. 0.8 mbs. L III sand (10 YR 8/6)	All layers sterile
8	1.1	L I disturbed sand (10 YR 7/2 to 7/4) to c. 0.3 mbs. L II alluvium (7.5 YR 5/2) to c. 0.8 mbs. L III stream gravel (7.5 YR 4/2) to bottom	All layers sterile
9	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II alluvium (7.5 YR 5/2) to c. 0.9 mbs. L III sand (10 YR 8/6) to bottom	All layers sterile
10	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to bottom	L I and L II sterile
11	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to bottom	L I and L II sterile
12	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to bottom	L I and L II sterile
13	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to bottom	L I and L II sterile
14	1.1	L I sand (10 YR 7/4) to c. 0.1 mbs. L II sand to (10 YR 8/6) to bottom	L I and L II sterile
15	0.8	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
16	0.9	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to root	L I and L II sterile
17	1.1	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to bottom	L I and L II sterile
18	0.9	L I sand (10 YR 7/4) to c. 0.3 mbs. L II sand (10 YR 8/6) to lithified sand	L I and L II sterile
19	1.1	L I sand (10 YR 7/4) to c. 0.2 mbs. L II sand (10 YR 8/6) to bottom	L I and L II sterile
20	2.0 ¹	L III sand (10 YR 8/6) to bottom	L III sterile
21	2.0 ²	L III sand (10 YR 8/6) to bottom	L III sterile

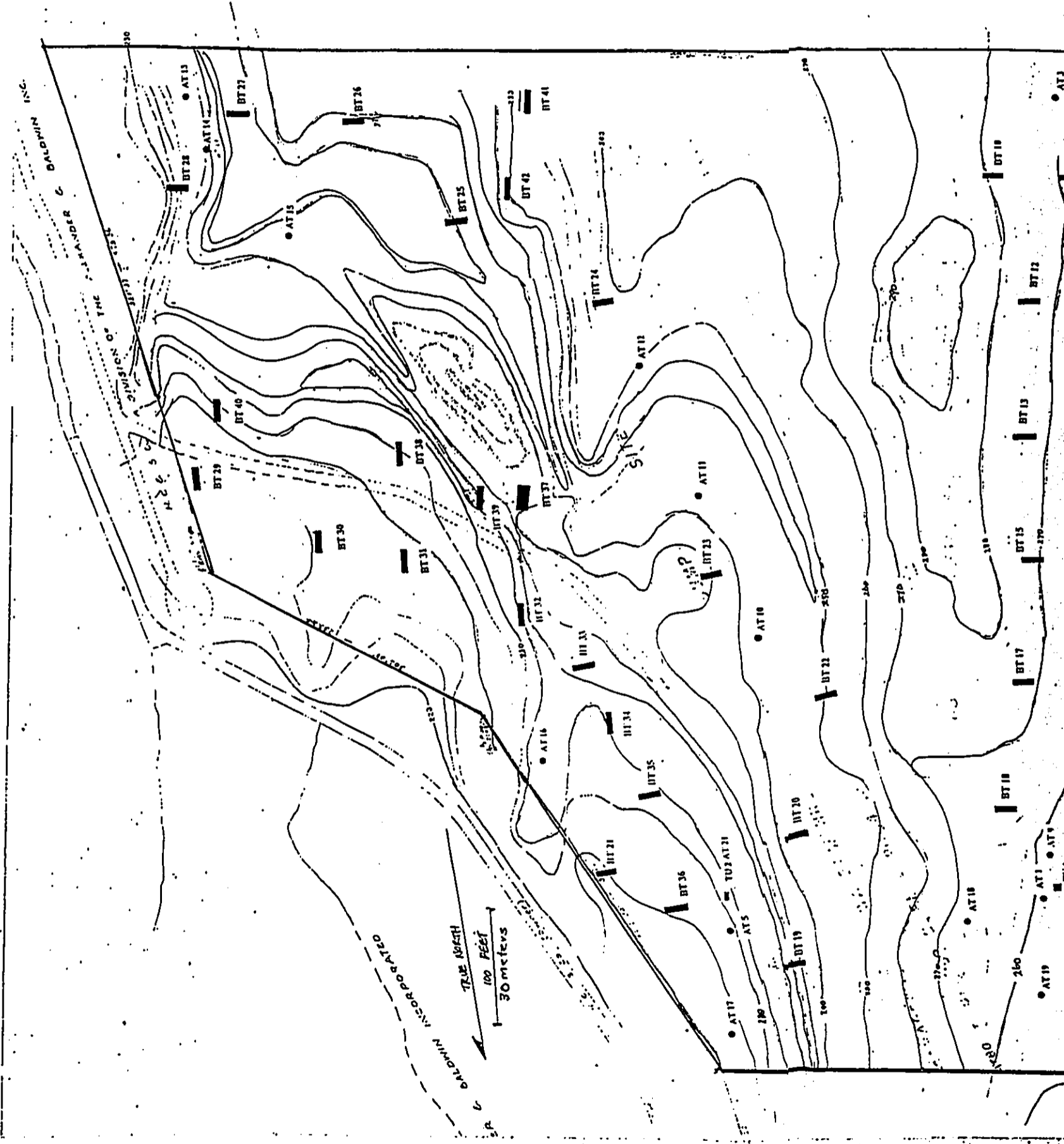
¹AT 20 began at 0.9 mbs in TU 1.

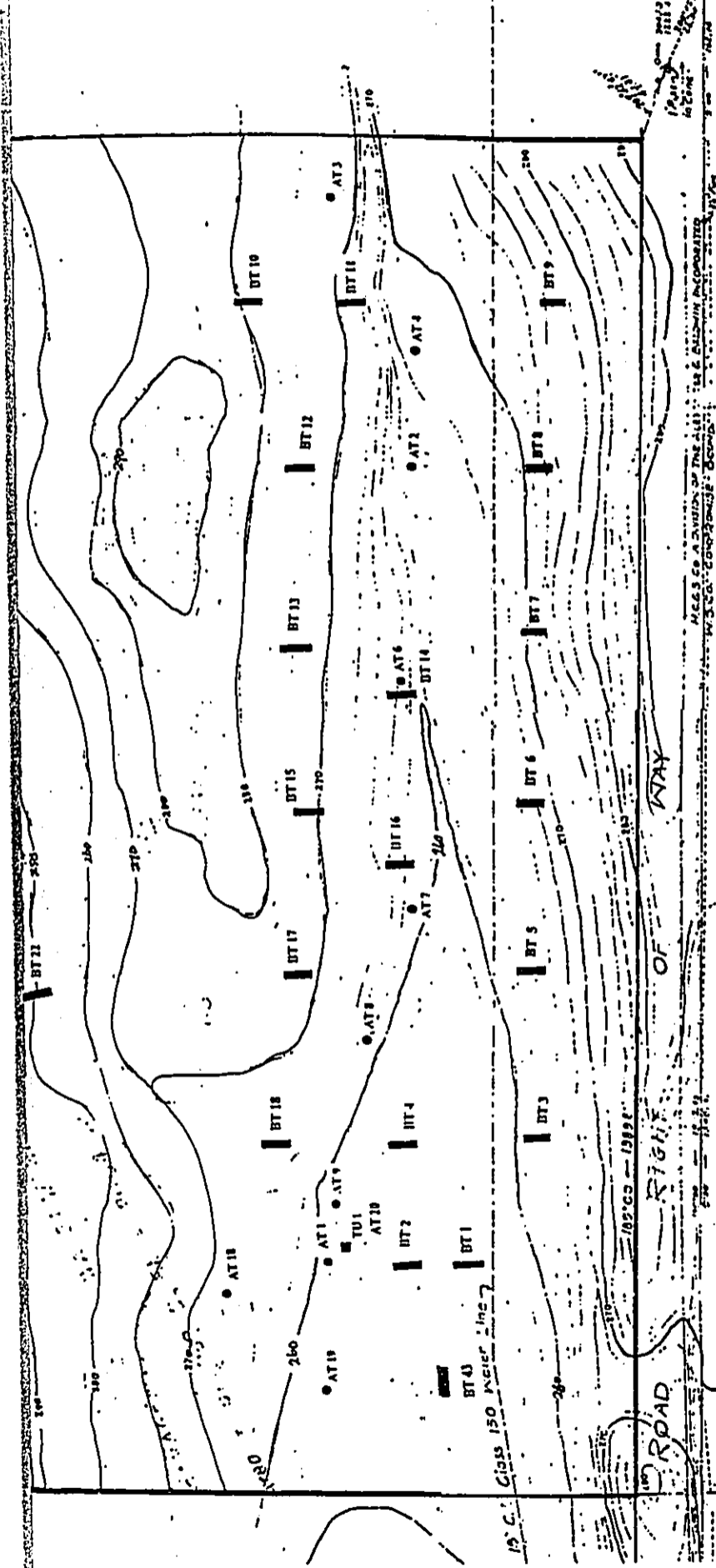
²AT 21 began at 0.9 mbs in TU 2.



Map 2 - Tax Map, Zone 3, Section 4, Plat 46, State of Hawaii.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100





COUNTY OF MAUI
 DEPARTMENT OF PUBLIC WORKS
 WAILUKU, MAUI, HAWAII

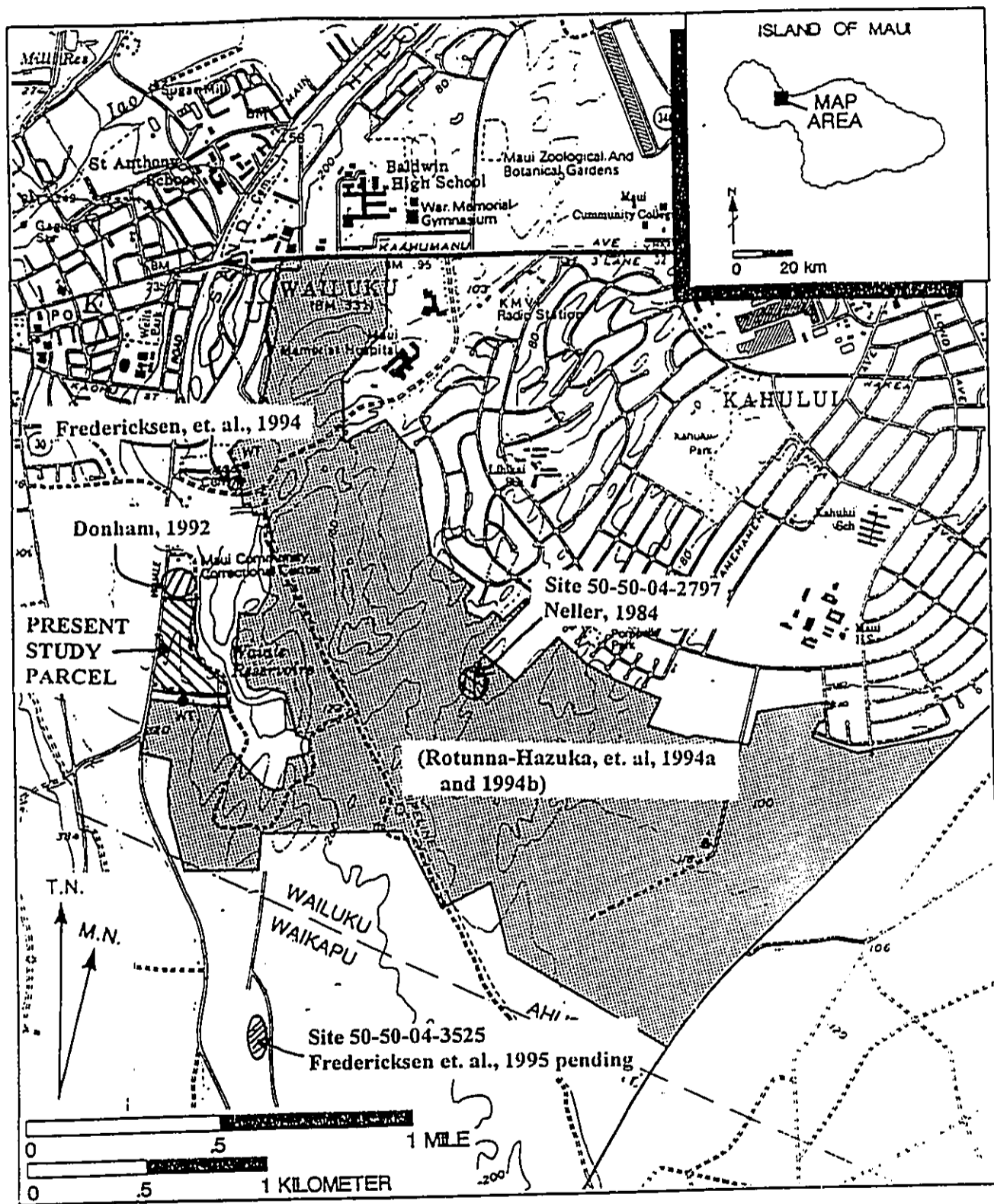
CONTOUR MAP

for
NEW MAUI COUNTY GARAGE, WATERWORKS & QUIP SITE
 WAILUKU, MAUI, HAWAII

Survey & Plan By: Fred Smith, C.E.
 Date: October 22, 1964
 Date: Description Of: MAUI STATE

**Map 3 - Topographic Site Map showing locations of backhoe tests (BT),
 auger tests (AT), and test units (TU). Map by County of Maui, 1964.**

Note: All Elevations Assumed.



Map 4 - Topographic map showing location of other archaeological studies in the vicinity of the study parcel. (Adapted from map by Bishop Museum, 1994).



Photo 1 - Subject property from Waiale Reservoir, looking toward the West Maui Mountains.



Photo 2 - Exposed dune on north side of parcel, rising from the Homeless Resource Center boundary.

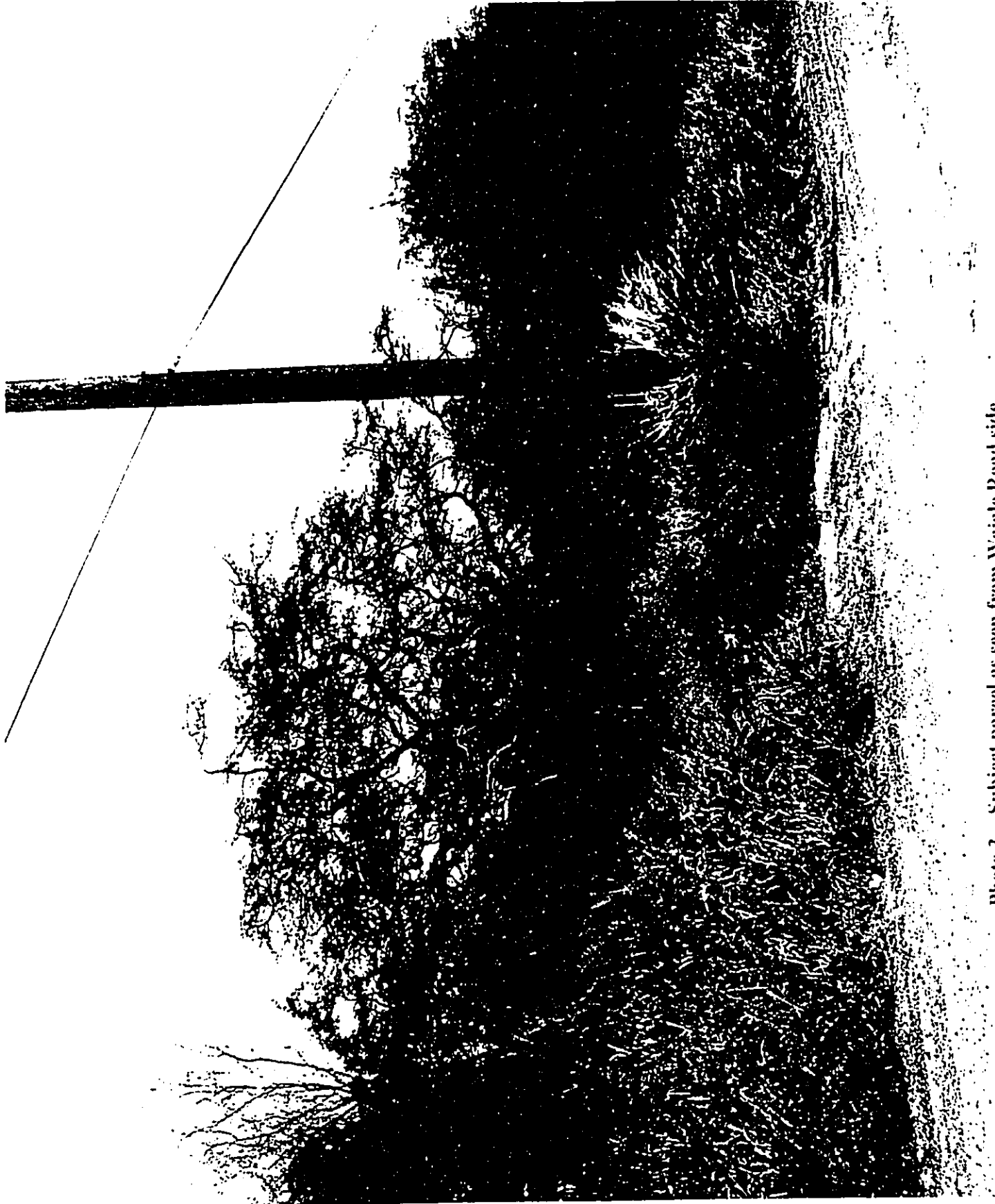


Photo 3 - Subject parcel as seen from Waiiale Road side.

DOCUMENT CAPTURED AS RECEIVED



Photo 4 - Recent bulldozed cut through heavy vegetation cover.



Photo 5 - Test Unit 2 excavation in progress.



Photo 6 - View of the interior portion of the subject parcel.

APPENDIX A

Soil Profiles for Backhoe Trenches

Representative Soil Profile Descriptions for BTs 1, 3, 4, 6 through 13, 15 through 32, 34, 35, 36, 38, 40, 41 and 42

Layer I: Very pale brown (10 YR 7/4); loamy sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; common live rootlets; contains no significant material culture remains. Layer I ranges from c. 0.1 to 0.6 m. thick in sampled areas.

Layer II: Yellow (10 YR 8/6) sand; nearly stoneless; apedal, single grain structure; fine texture; loose rootlets present; overlaps lithified sand in nearly all test instances; sterile. Layer II ranges from c. 0.2 to over 4 m. thick in tested areas.

Representative Soil Profile Descriptions for BTs 2, 5 and 43

Layer I: Very pale brown (10 YR 7/4); loamy sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; common live rootlets; sterile. Layer I is 0.3 to 0.4 m. thick in these 3 units.

Layer II: White (10 YR 8/2); sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; live rootlets present; sterile. Layer II is 0.4 to 0.5 m. thick in these 3 units.

Layer III: Pink (7.5 YR 7/4); sand; stoneless; apedal, single grain, structure; fine texture; loose, dry consistency; few live rootlets present; sterile. Layer III ranges from 0.15 to 0.4 m. thick in these 3 units.

Layer IV: Yellow (10 YR 8/6); sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; overlays lithified sand; sterile. Layer IV is 0.4 to 0.8 m. thick.

Soil Profile Descriptions for BT 14

Layer I: Light brown (7.5 YR 6/4); loamy sand; apedal single grain structure; fine texture; loose, dry consistency; disturbed by access road; sterile. Layer I is c. 0.2 m. thick.

Appendix A (cont.)

- Layer II: Brown (7.5 YR 5/2); sandy alluvium; few stones; very weakly developed subangular blocky structure; fine texture; moist, very friable consistency; contains live rootlets; sterile. Layer II is c. 0.9 m. thick.
- Layer III: Brown to dark brown (10 YR 4/2); sandy alluvium, stream gravels and waterworn pebbles; mixed structure; fine to coarse texture; generally loose, dry consistency; contains water deposited vegetal remains; sterile. Layer II is c. 0.4 m. thick.
- Layer IV: Yellow (10 YR 8/6); sand; apedal, single grain structure; fine texture; loose, dry consistency; sterile. Layer IV is at least 2.9 m. thick.

Soil Profile Descriptions for Backhoe Trench 33

- Layer I: Very pale brown (10 YR 7/4); loamy sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; common live rootlets; sterile. Layer I is 0.4 m. thick.
- Layer II: Very pale brown (10 YR 8/4); sand; contains pieces of lithified sand; apedal, single grain structure; fine texture; loose, dry consistency; few live rootlets; sterile. Layer II is 0.9 m. thick.
- Layer III: Yellow (10 YR 8/6); sand; stoneless; apedal, single grain structure; fine texture; loose, dry, consistency; overlays lithified sand; sterile. Layer III is 1.5 m. thick.

Soil Profile Descriptions for Backhoe Trenches 37 and 39

- Layer I: Very pale brown (10 YR 7/4); loamy sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; common live rootlets; sterile. Layer I is up to 0.6 m. thick.
- Layer II: Grayish brown (10 YR 5/2); sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; rootlets present; slight charcoal staining present; sterile. Layer II is c. 0.1 to 0.2 m. thick.
- Layer III: Yellow (10 YR 8/6); sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; sterile. Layer III is c. 1.3 m. thick.

Appendix A (cont.)

Layer IV: White (10 YR 8/2); sand; contains pieces of lithified sand; apedal, single grain structure; fine texture; loose, dry consistency, sterile. Layer extend to bottoms of BT 37 and 39 and is at least 1 m. thick.

Soil Profile Descriptions for TU 1 and TU 2

Layer I: Very pale brown (10 YR 7/4); loamy sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; common live rootlets; sterile. Layer I is c. 0.3 m. thick.

Layer II: Grayish brown (10 YR 5/2); sand; stoneless; apedal, single grain structure; fine texture; loose, dry consistency; rootlets present; sterile. Layer II is c. 0.1 m. thick.

Layer III: Yellow (10 YR 8/6); sand; contains pieces of lithified sand; apedal, single grain structure; fine texture; loose, dry consistency; sterile. Layer III extends to bottoms of both TU 1 and TU 2.

Appendix C

Preliminary Engineering Report

PRELIMINARY ENGINEERING REPORT
FOR
WAIALE AFFORDABLE HOUSING
WAILUKU, MAUI, HAWAII

Prepared For:

County of Maui
Wailuku, Hawaii

Prepared By:

Warren S. Unemori Engineering, Inc.
Civil and Structural Engineers - Land Surveyors
Wells Street Professional Center, Suite 403
2145 Wells Street
Wailuku, Maui, Hawaii 96793

July, 1995

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APPENDIX

- A Preliminary Drainage and Soil Erosion Control Report

**Preliminary Engineering Report
for
Waiale Affordable Housing Project**

1.0 INTRODUCTION

This report provides a brief description of existing water, drainage, sewer, roadway, electrical and telecommunication facilities in the project vicinity. It also provides an insight to probable infrastructural improvements required to support the project.

2.0 EXISTING INFRASTRUCTURE

2.1 WATER

2.1.1 Source

Water for properties along Waiale Road comes from the Iao tunnel source. The intake for this source is located at elevation 782 feet, approximately 900 feet mauka (west) of Kepaniwai Park. This source is supplemented by a well located north of Kepaniwai Park at elevation 713 feet. This well taps high level dike water.

2.1.2 Storage

Storage for the project site and vicinity is provided by the recently completed 3.0 M.G. storage reservoir located southwest of the intersection of Alu Road and Iao Road. The floor elevation of this storage reservoir is 506 feet.

2.1.3 Transmission System

Approximately 8800 feet of 12 inch waterline conveys water from the tunnel source and Kepaniwai well to the 3.0 MG Iao reservoir. From this reservoir an eighteen (18) inch line on Iao Road conveys water to the high level distribution system in Wailuku town beginning at High Street. A network of 12 and 8 inch lines then distributes water down to Waiale Road and south to the Ka Hale A Ke Ola driveway entrance. A twelve (12) inch transmission line also links the Iao tank to the system on Waiale Road. This line begins at the tank, cuts across the Wailuku Project District Mauka parcel, follows Malolo Road to High Street, then runs along High Street and Honoapiilani Highway to its intersection with the recently completed Kehalani Makai Parkway, then down along this Parkway, Kamole Street and Olomea Street to Waiale Road.

2.2 DRAINAGE

Present runoff from the project site for a 10-year recurrent interval rainfall is approximately 17.8 cfs. No runoff from mauka lands currently flows onto the project site.

2.3 SEWER SYSTEM

There is an existing 8 inch sewer line on the west side of Waiale Road fronting the Waiale Affordable Housing (WAH) project site. North of Spreckels Ditch this collector line increases in size to 10 and 12 inches and runs through the residential lots west of Waiale Road before connecting to the gravity line on Lower Main Street north of Kaahumanu Avenue overpass.

The capacity of the collector line in this section is rapidly nearing capacity. Therefore the developer of Wailuku Project District, C. Brewer Homes, Inc., was required to install a new 18 inch gravity sewer line on Waiale Road between Spreckels Ditch and the Kaahumanu overpass. Installation of this new 18 inch sewer line is about 90% complete and is expected to be placed into service soon.

North of the Kaahumanu Overpass, sewage is conveyed to the Wailuku pump station located east of Waiehu Beach Road by a series of 12, 15, and 18 inch sewer lines on Lower Main Street. This station then pumps all the wastewater collected from Wailuku, Waiehu, and portions of Kahului to the Kahului Wastewater Reclamation Facility via an 18 inch force main for final treatment and disposal.

The Kahului Wastewater Reclamation Facility was recently expanded, increasing its capacity from 6.0 MGD to 7.9 MGD. Therefore it has adequate capacity to treat and dispose wastewater generated by the WAH project.

2.4 ROADWAY

The County road right-of-way for Waiale Road presently terminates at the south entrance to the Maui Community Correctional Center approximately 800 feet north of the project site. The unimproved former canehaul road fronting the project site is presently owned by Wailuku Agribusiness Company.

2.5 ELECTRICAL, TELEPHONE, AND CATV

Overhead power and telephone lines are available on the east side of Waiale Road fronting the project site.

3.0 PROBABLE INFRASTRUCTURAL IMPROVEMENTS

3.1 WATER

3.1.1 Projected Water Demand (Ave. Daily)

- Rate MFD Residential = 560 gals./unit
- 200 units x 560 gpud = 112,000 gpd

3.1.2 Source

Applicant's prorata contribution for new source development will be by means of meter fees as prescribed in the Rules and Regulations of the Department of Water Supply.

3.1.3 Storage

Since a new 3.0 MG storage reservoir was recently constructed for the Wailuku high level service area, storage assessment will also be paid for as part of the meter fee.

3.1.4 Transmission System

As stated previously, the existing 12 inch line on Waiale Road ends at the existing entrance to Ka Hale A Ke Ola Housing complex. A new 12 inch transmission line will have to be extended along Waiale Road approximately 600 feet south to the WAH project site.

3.1.5 Distribution System

A distribution system will have to be extended into the project. Preliminary indications are that this line will have to be 12 inches in diameter in order to provide the fire flow required. Fire hydrants will be located a minimum distance of 150 feet of all buildings at intervals not exceeding 250 feet. Each building will be metered separately.

3.2 DRAINAGE

Post development runoff from the project site for a 10-year recurrent interval rainfall is estimated to be about 40.9 cfs. This translates to an increase of 23.1 cfs over current conditions.

Onsite runoff will be collected by catch basins dispersed throughout the project site and conveyed by drainlines into subsurface retention facilities. These retention facilities will be placed underground within parking lots or playground areas. They will be provided with access manholes for maintenance. These facilities will be sized to accommodate the additional flow generated by the project. Onsite runoff equivalent to pre-development runoff will be allowed to sheet flow off the project toward Waiale Reservoir as it is currently doing.

3.3 SEWER SYSTEM

The proposed multifamily residential project is expected to generate approximately 60,000 gpd (200 units @ 300 gpud) of wastewater.

By letter dated June 8, 1995, the Department of Public Works and Waste Management (DPWWM) confirmed that the existing 8 inch sewer line

on Waiale Road fronting the project site still has capacity to receive the projected wastewater generated by the WAH project.

Since the project site is situated lower than the existing gravity line on Waiale Road, a sewer pump station will have to be installed at the lower corner of the project site. Wastewater generated by the project will be directed into this pump station by a gravity collection system and pumped into the existing gravity line on Waiale Road via a force main.

The applicant will be seeking an exemption from payment of fee for the expansion of the Kahului Wastewater Reclamation Facility as provided for in Section 14.35.080 of the Maui County Code.

3.4 ROADWAY

The County Department of Public Works and Waste Management is developing plans to extend Kuikahi Street to connect Honoapiilani Highway to Waiale Road and to improve Waiale Road between this connection and Waenu Road north of the Spreckels Ditch crossing. This roadway will consist of a 24 feet wide travelway and 6 foot paved shoulder on each side. According to DPWWM, construction of this project is expected to commence in early 1996.

The main access to the project site will be located on Waiale Road, 125 feet north of the southerly boundary of the site and approximately 500 feet north of the proposed intersection of Kuikahi Road Extension and Waiale Road.

A second access will be provided on Waiale Road approximately 45 feet south of the northerly boundary of the project site. However, this access will be restricted to right turn in and right turn out movements only. No left turn movement will be allowed. The location of these two accesses and conditions are based on discussions with the Traffic Engineering Division of DPWWM.

Curb, gutter and sidewalk, as well as additional pavement widening will have to be installed along the project frontage in compliance with the provisions of the Maui County Code.

All internal roads and parking lots will be paved. Concrete curbs will also be installed along all edges of the roads and parking lots.

3.5 ELECTRICAL, TELEPHONE, AND CATV

Power and communication cables will be extended overhead into the project site from the overhead system on Waiale Road.

PRELIMINARY DRAINAGE AND SOIL EROSION CONTROL REPORT

FOR

**WAIALE AFFORDABLE HOUSING SITE
(LOT 2-A OF KA HALE A KE OLA SUBDIVISION)**

Wailuku, Maui, Hawaii

TMK: 3-8-07:Por. 58

**DEVELOPER: County of Maui
ADDRESS: Wailuku, Maui, Hawaii**

Prepared By:

**Warren S. Unemori Engineering, Inc.
Civil and Structural Engineers - Land Surveyors
Wells Street Professional Center, Suite 403
2145 Wells Street
Wailuku, Maui, Hawaii 96793**

June, 1995

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- 2 Soil Survey Map
- 3 Flood Insurance Rate Map

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- A Hydrologic Calculations
- B Universal Soil Loss Equation Calculations

**Preliminary Drainage and Soil Erosion Control Report
for
Waiale Affordable Housing
(Lot 2-A of Ka Hale A Ke Ola Subdivision)**

I. INTRODUCTION

This report has been prepared to evaluate existing onsite drainage conditions. It also provides a brief description of the proposed post-development drainage plan for subject development.

Calculations to determine the potential movement of soil due to rainfall and surface runoff off the project area in accordance with Chapter 20.08 of the Maui County Codes are also presented.

II. PROPOSED PROJECT

A. Site Location:

The project site is located in Wailuku, on the island of Maui, and in the State of Hawaii. It is situated makai (east) of Honoapiilani Highway (F.A.P. No. 13-G) and the Wailuku Project District Makai Large-Lot Subdivision. The project site is Lot 2-A of the Ka Hale A Ke Ola Subdivision, and is located immediately makai of the proposed Waiale Road Extension, approximately 1,000 feet south of the Olomea Street-Waiale Road intersection. The Ka Hale A Ke Ola housing project abuts the northern end of the project site, and the Kahului 3 M.G. Reservoir Subdivision sits on its southern end.

The project site encompasses an area of approximately 15.0 acres.

B. Project Description:

The proposed plan for the Ka Hale A Ke Ola Subdivision, Lot 2-A - Waiale Affordable Housing (WAH) project is a multi-family development which will consist of 200 multi-family residential units with a community center and a 3.0 acre park and playground. Roadway improvements will consist of asphalt paved driveways and parking areas, concrete sidewalks, concrete curb and gutters, and landscaping. Utility improvements will consist of underground utility systems for drainage, water, and sewerage systems. Electrical, telephone, and cable television distribution systems will be placed overhead.

II. EXISTING CONDITIONS:

A. Topography and Soil Conditions:

The project site is presently undeveloped and overgrown with trees, weeds, and shrubbery. Natural vegetation includes but is not limited to bermudagrass, feather fingergrass, kiawe, klu, koa haole, lantana, and natal redtop.

The existing ground slopes in a general southerly to northerly direction from an elevation of (+) 296± feet M.S.L. to (+) 250± feet M.S.L. with an average slope of 7.1%.

According to the "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii (August, 1972)"¹, prepared by the United States Department of Agriculture, Soil Conservation Service, the project site consists of two (2) types of soils. They are classified as the Iao

Series, Iao Silty clay, 0 to 3 percent slopes (IaA) and the Puuone Series, Puuone Sand, 7 to 30 percent slopes (PZUE). (See Exhibit 2)

The Iao Silty Clay is characterized as having slow runoff with a slight erosion hazard. The Puuone Sand is characterized as having rapid permeability, slow runoff and a moderate to severe erosion hazard.

B. Flood and Tsunami Zone:

According to Panel Number 150003 0190D of the Flood Insurance Rate Map revised March 16, 1995, prepared by the United States Federal Emergency Management Agency, the entire site is situated within Zone C which is designated as areas prone to minimal flooding (see Exhibit 3).

C. Drainage:

According to our calculations, approximately 17.8 cfs of onsite surface runoff is presently generated by the project site during a 10 year-1 hour recurrence interval storm. (See Appendix A). This onsite surface runoff sheet flows in a southerly to northerly direction across the project site and into the adjoining properties.

IV. PROPOSED DRAINAGE PLAN

A. General:

According to our calculations, the post development onsite surface runoff volume generated by the project site will be approximately 40.9 cfs. Accordingly, there will be a net increase of approximately 23.1 cfs due to the proposed development (see Appendix A).

Catch basins will be installed as part of the proposed subdivision within the proposed subdivision roadways and parking lots to intercept the onsite runoff volume. The intercepted surface runoff will then be conveyed by means of an underground drainage system and stored in a new underground subsurface retention system. The subsurface retention system will be sized to accommodate the net increase in surface runoff, while the pre-development surface runoff will continue to sheet flow off the project site and onto adjacent properties as it is presently doing.

B. Hydrologic Calculations:

The hydrologic calculations are based on the "Drainage Master Plan for the County of Maui" and the "Rainfall Frequency Atlas of the Hawaiian Islands", Technical Paper No. 43, U. S. Department of Commerce, Weather Bureau.

Rational Formula used:

$$Q = CIA$$

Where Q = Rate of Flow (cfs)

C = Rainfall Coefficient

I = Rainfall Intensity (inches/hour)

A = Area (Acres)

The hydrologic calculations for this project may be found in Appendix A.

C. Conclusion:

According to our calculations, the Ka Hale A Ke Ola Subdivision, Lot 2-A, Waiale Affordable Housing project will create an additional onsite surface runoff volume of approximately 23.1 cfs (see Appendix A). However, the additional onsite surface runoff volume generated by the proposed development will be discharged into a subsurface retention basin which will be sized to accommodate the 10 year recurrence interval, 1 hour duration storm. Accordingly, the volume of surface runoff sheet flowing off the project site after development will be equal to or less than the present runoff volume. Therefore it is our professional opinion that the proposed development will not adversely affect the adjoining properties.

V. SOIL EROSION CONTROL PLAN

A. Grading Plan:

Grading work for the Ka Hale A Ke Ola Subdivision, Lot 2-A, will be conducted in one (1) phase since the area of grading is less than the allowable fifteen (15) acres. Upon completion of the grading, all exposed areas will be grassed as required.

B. Soil Erosion Control Plan:

The following measures will be taken to control erosion during the site development period (estimated 12 months).

1. Minimize time of construction.
2. Retain existing ground cover until latest date to complete construction.

3. Early construction of drainage control features.
4. Use temporary area sprinklers in non-active construction area when ground cover is removed.
5. Station water truck on site during construction period to provide for immediate sprinkling, as needed, in active construction zones (weekends and holidays included).
6. Use temporary silt screen fencing, berms and cut-off ditches, where needed, for control of erosion.
7. Graded areas shall be thoroughly watered after construction activity has ceased for the day and on weekends.
8. All cut and fill slopes shall be sodded or planted immediately after grading work has been completed.
9. Install silt screens whenever appropriate.

VI. CONCLUSION

Although the "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, (August, 1972)", characterizes the soil at the project site as having a moderate to severe erosion hazard, our calculations indicate that the sedimentation hazard to coastal waters and downstream properties for the proposed development are minimal (see Appendix B). The soil loss per unit area and severity rating computed for the proposed development are well within the tolerable limits and additional erosion control measures are not required.

VII. REFERENCES

1. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* August 1972. United States Department of Agriculture, Soil Conservation Service.
2. *Flood Insurance Rate Map, Maui County, Hawaii.* Community-Panel Number 150003 0190D. March 16, 1995. Federal Emergency Management Agency, Federal Insurance Administration.
3. *Drainage Master Plan for the County of Maui, State of Hawaii.* October 1971. R.M. Towill Corporation.
4. *Rainfall Frequency Atlas of the Hawaiian Islands, Technical Paper No. 43.* 1962. U.S. Department of Commerce, Weather Bureau.
5. *Storm Drainage Standards.* March 1986. Department of Public Works, City and County of Honolulu.

Report Prepared By:

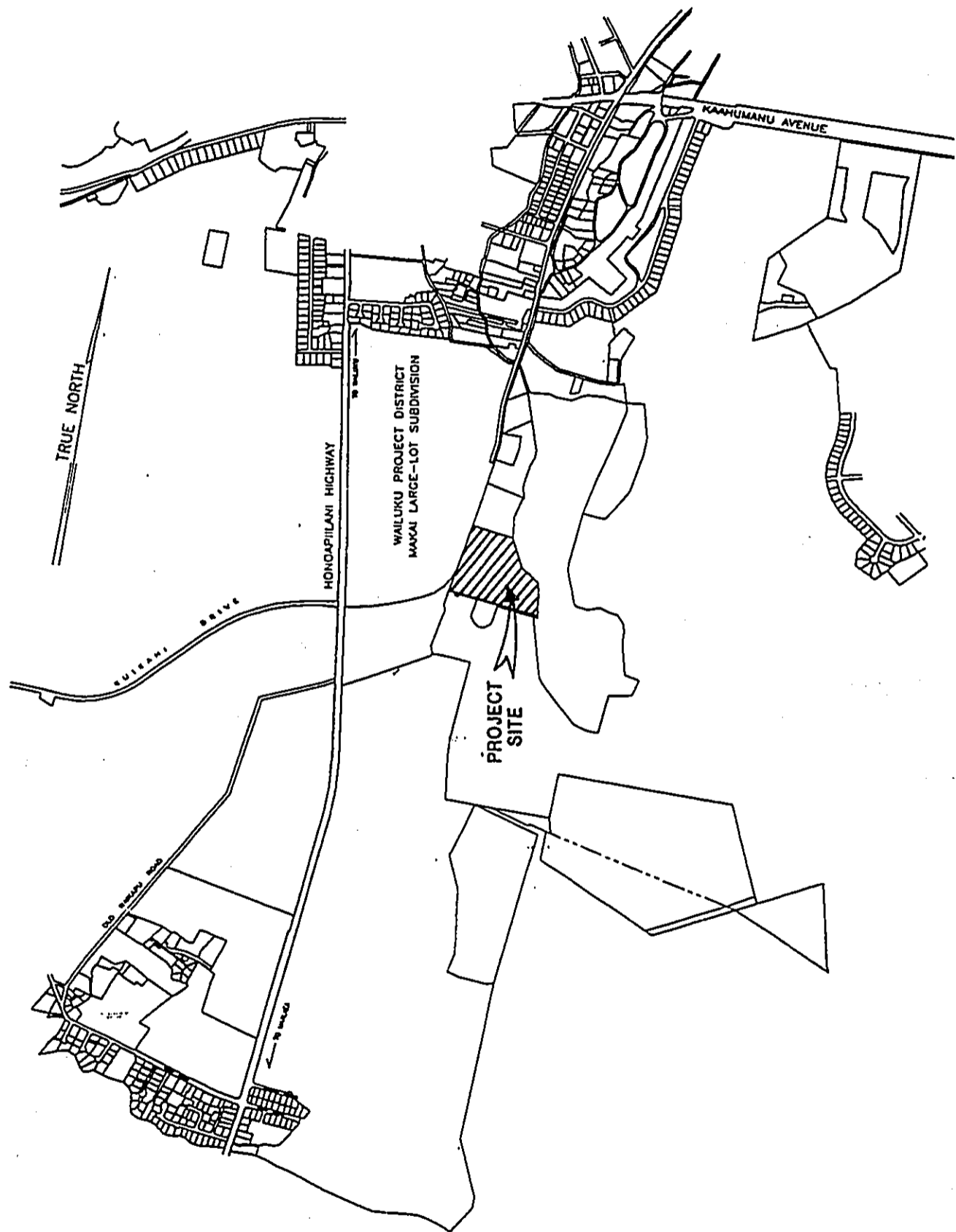
Carlos R. Rivera
Carlos R. Rivera

Report Checked By:

Reed M. Ariyoshi
Reed M. Ariyoshi

EXHIBITS

1. Location Map
2. Soil Survey Map
3. Flood Insurance Rate Map



**Exhibit 1
LOCATION MAP**

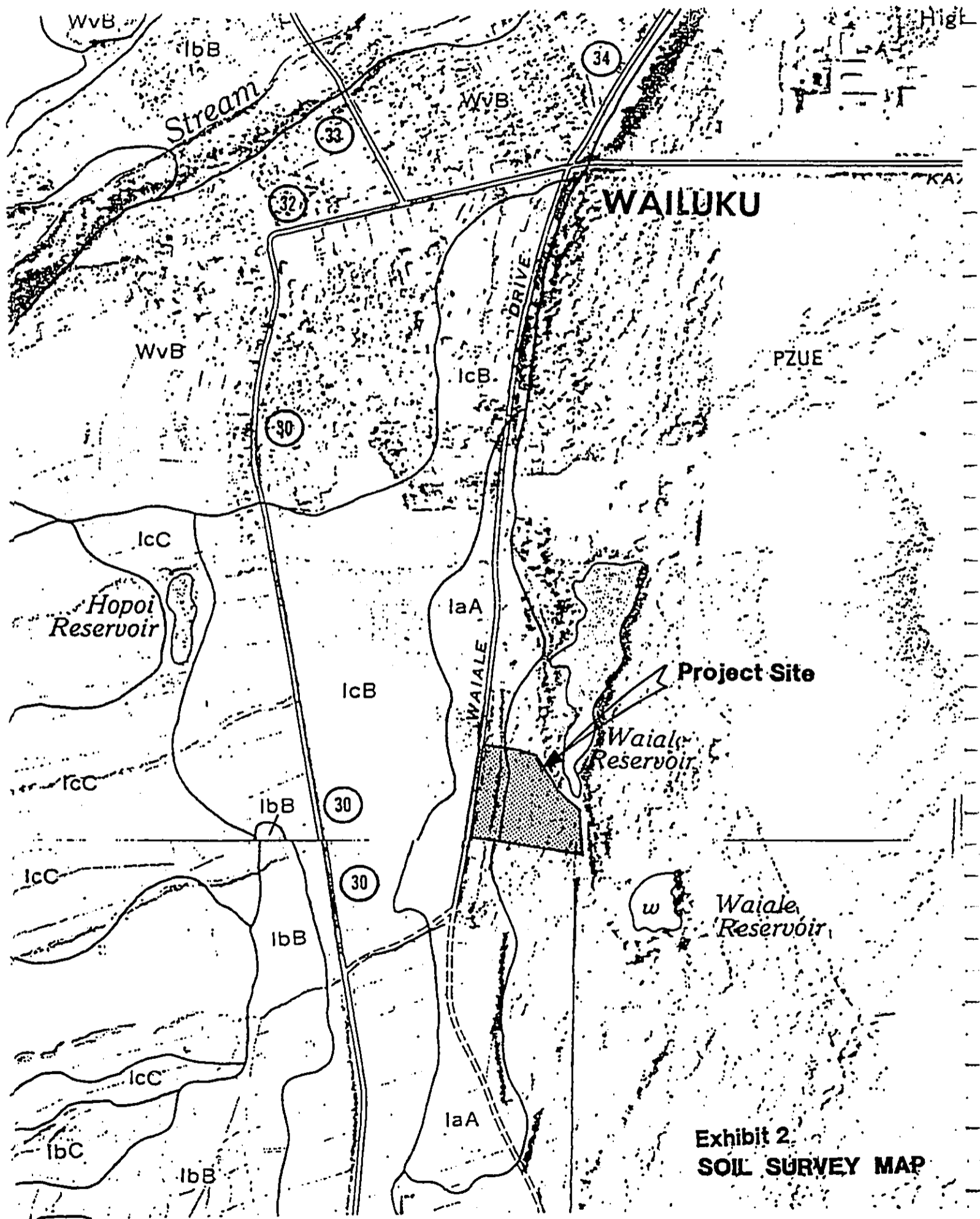
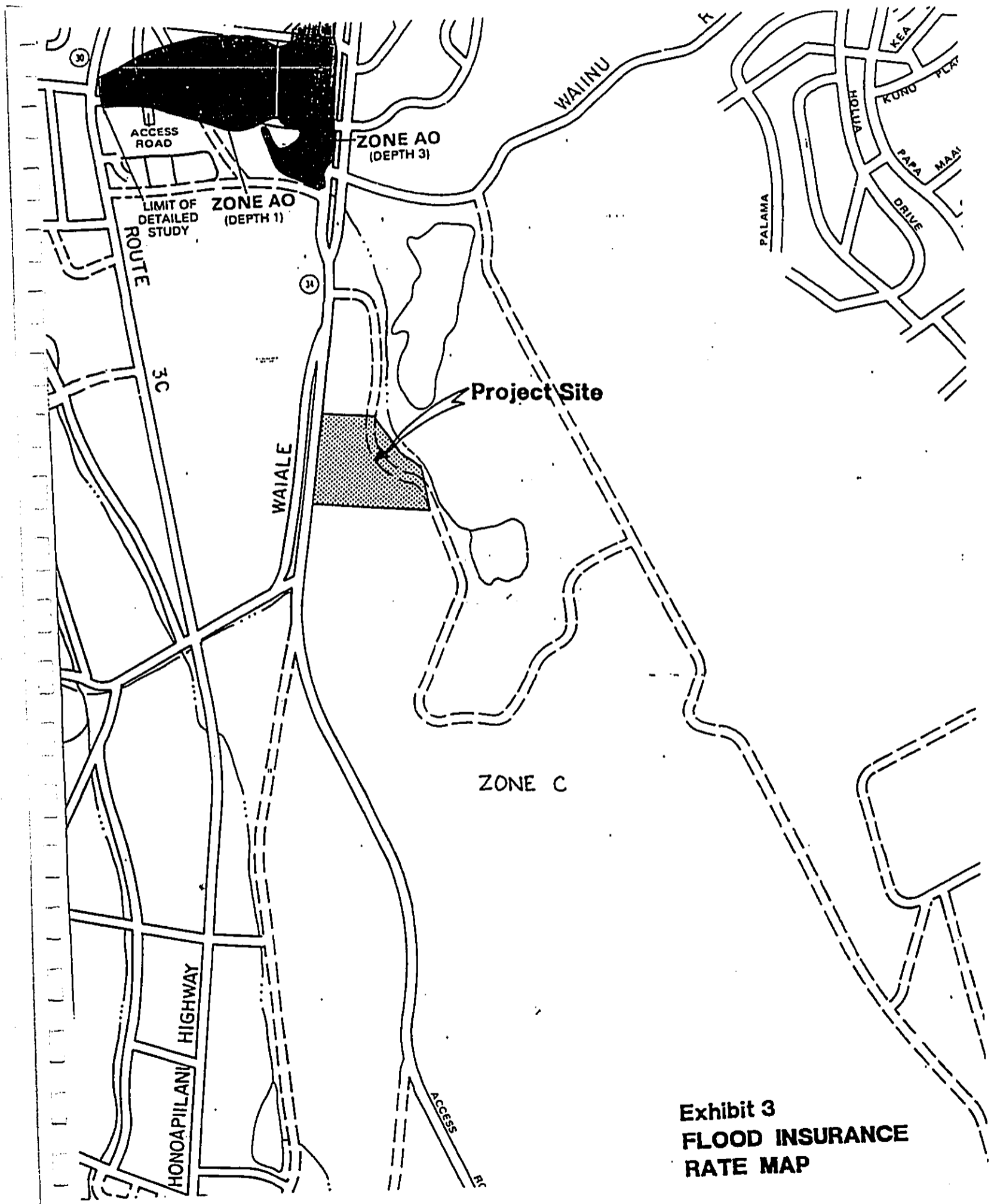


Exhibit 2
SOIL SURVEY MAP



**Exhibit 3
FLOOD INSURANCE
RATE MAP**

APPENDIX A
HYDROLOGIC CALCULATIONS

Warren S. Unemori Engineering, Inc.
Wells Street Professional Center
2145 Wells Street, Suite 403
Wailuku, Maui, Hawaii 96793

Date: June 15, 1995

SUBSURFACE DRAINAGE SYSTEM ANALYSIS AND DESIGN

Project: Ka Hale A Ke Ola Subdivision - Lot 2-A
Location: Wailuku, Maui, Hawaii
Job Number: 93013
Objective: To determine the storage requirements for full attenuation of the anticipated increase in onsite surface runoff attributable to the project development. A recurrence interval of ten (10) years is used.

I. Determine 10-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Wailuku, Maui,
R(10 Yr.-1Hr.) = 2.00 inches

II. Determine Pre-Development Runoff:

Pre-Development Component Areas:

Total Area (Ac.): 15.0

Pre-Development Runoff Coefficients:

Infiltration:	Slow	0.14
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Poor (< 10%)	0.05
Development Type:	Agricultural	0.15
Composite Runoff Coeff't., C:		0.37

Pre-Development Time of Concentration:

Approx. Elev. Diff'l. (feet):	46
Higher Elev. (ft.):	296.0
Lower Elev. (ft.):	250.0
Approx. Runoff Length (ft.):	620
Average Slope:	7.4%
Ground Character:	Ave. grass
Time of Concentration (min.):	21

Pre-Development Intensity:

Intensity (in.):	3.2
------------------	-----

Pre-Development Runoff:

Q (pre-dev.) = C x I x A (cfs):	17.81
Allowable Release Rate(cfs):	17.81

III. Determine Post-Development Runoff:

Post Development Component Areas:

Total Area (Ac.):	15.0
-------------------	------

Post-Development Runoff Coefficients:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good	0.03
Development Type:	Industrial/Business	0.55
Component Runoff Coeff't., C:		0.68

Post-Development Time of Concentration:

Approx. Elev. Diff'l. (feet):	48
Higher Elev. (ft.):	288.0
Lower Elev. (ft.):	240.0
Approx. Runoff Length (ft.):	600
Average Slope:	8.0%
Ground Character:	Bare soil
Time of Concentration (min.):	12

Post-Development Intensity:

Intensity (in.): 4

Post-Development Runoff:

Q (post-dev.) = $C \times I \times A$ (cfs): 40.91

IV. Establish Initial Trench Cross Section Parameters:

Cover Over Pipe (ft.):	2.00
Pipe Diameter (ft.):	6.00
Cradle Depth Below Pipe (ft.):	1.00
Cradle Thickness on Sides of Pipe (ft.):	2.00
Total Trench Depth (ft.):	9.0
Total Trench Width (ft.):	10.0
Gross Trench Cross Sectional Area (sf/lf):	90.0
Pipe Cross Sectional Area (sf/lf):	28.3
Trench Aggreg. Cross Sectional Area (sf/lf):	61.7

V. Assume Initial Length of Pipe:

Assumed Initial Length of Pipe / Trench (ft.): 390

VI. Determine Adequacy of Storage Volume Provided:

Determine Required Storage Volume:

Analytical procedures are based on methods prescribed in "Modern Sewer Design" (dated 1980, by the American Iron and Steel Institute).

Intensity values are obtained from the the Intensity-Duration Curves found page 122 of the "Drainage Master Plan for the County of Maui" (dated 1971, by R.M. Towill Corp.).

Time (min.)	I (in/hr)	Post-Dev. C x A (ac)	Accum. Runoff Vol. (cf)	Allow. Release (cfs)	Total Outflow (cfs)	Comments
(1)	(2)	(3)	(4)	(5)	(6)	
5	5.20	10.23	15,954	5,343	10,611	
10	4.10	10.23	25,159	10,686	14,473	
15	3.70	10.23	34,057	16,029	18,028	
20	3.30	10.23	40,500	21,372	19,128	
30	2.80	10.23	51,545	32,058	19,487	Peak Storage
40	2.45	10.23	60,136	42,744	17,392	
60	2.00	10.23	73,636	64,116	9,520	
80	1.90	10.23	93,272	85,488	7,784	
100	1.60	10.23	98,181	106,860	-8,679	

(COL 4) = (COL 1) x (COL 2) x (COL 3) x (60 sec./min.)

(COL 5) = Q(allowable) x (COL 1) x (60 sec./min.)

(COL 6) = (COL 4) - (COL 5)

(COL 7) = (COL 5) + (COL 6)

(COL 8) = (COL 4) - (COL 7)

Maximum Storage Required (cf): 19,487

Determine Provided Storage Volume:

Pipe Storage Capacity (cf): 11,027

Net Aggregate Cradle Storage Capacity (cf): 9,629

Gross Aggregate Cradle Volume (cf): 24,073
Void Ratio (ie, percent voids): 0.40

Total Storage Capacity Provided (cf): 20,656

{Storage Provided = 20,656 cf} > {Storage Required = 19,487 cf}; therefore initial assumptions based on 390 l.f. of 72 - inch diameter pipe are acceptable.

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APPENDIX B

UNIVERSAL SOIL LOSS EQUATION CALCULATIONS

H.E.S.L. Report Page 1 of 3
W.S. UNEMORI ENGINEERING, INC.
2145 Wells Street Suite 403
Wailuku, Maui, Hawaii 96793

BY: CRR
DATE: June 14, 1995

H . E . S . L .
FOR
KA HALE AKE OLA SUBDIVISION - LOT 2-A

UNIVERSAL SOIL LOSS
EQUATION CALCULATION

1. HESL EQUATION: $E = R * K * LS * C * P$

WHERE: E = Soil Loss (tons/acre/year)
R = Average Annual Rainfall Factor for Erosion
K = Soil Erodibility Factor
L = Horizontal Slope Length (feet)
S = Average Slope (%)
LS = Slope Factor (function of L and S)
C = Cover and Management Factor
P = Erosion Control Practice Factor

R = 190.0 tons/acre/year
(Soil Erosion & Sediment Control Guide for Hawaii;
Appendix A: Average Annual Values of Rainfall Factor)

K = 0.10 Soil Series: PUUONE
(Soil Survey of Islands of Kauai, Oahu, Maui, Molokai,
and Lanai, State of Hawaii; Soil Type Plates & Table 4;
Soil Properties Related to Erosion & Sedimentation)

L = 480.0 feet
 δ = 66.0 feet
(Soil Erosion & Sediment Control Guide for Hawaii;
Table 16)

S = (δ/L)
= 13.8 %

LS = 4.887

H.E.S.L. Report Page 2 of 3
W.S. UNEMORI ENGINEERING, INC.
2145 Wells Street Suite 403
Wailuku, Maui, Hawaii 96793

BY: CRR
DATE: June 14, 1995

KA HALE AKE OLA SUBDIVISION - LOT 2-A
[Continued]

C = 1.00
(Soil Erosion & Sediment Control Guide for Hawaii
Tables 17-22, Pages 59-61; C=1.00 for Bare Soil)

P = 1.00
(Soil Erosion & Sediment Control Guide for Hawaii;
the Universal Soil Loss Equation in Hawaii)

E = R*K*LS*C*P
= 92.9 tons/acre/year

2. SEVERITY RATING NUMBER EQUATION: $H = [(2 * F * T) + (3 * D)] * A * E$

WHERE: H = Severity rating number
T = Duration of land-disturbing activity (years)
A = Area subject to disturbance (acres)
E = Rate of soil loss under disturbed conditions
(tons/acre/year)
F = Downslope-downstream rating factor
(rating points/ton)
D = Coastal water rating factor
(rating points/ton)

T = 1.00 years

A = 15.00 acres

E = R*K*LS*C*P
= 92.9 tons/acre/year

F = 4 (Downslope-downstream detriment: Major)

D = 2 (Coastal water rating factor: Class A)

H = $[(2 * F * T) + (3 * D)] * A * E$
= 19,500.0

Standard severity rating (allowable): $50,000 \geq 19,500.0 \Rightarrow OK$

H.E.S.L. Report Page 3 of 3
W.S. UNEMORI ENGINEERING, INC.
2145 Wells Street Suite 403
Wailuku, Maui, Hawaii 96793

BY: CRR
DATE: June 14, 1995

KA HALE AKE OLA SUBDIVISION - LOT 2-A
[Continued]

3. MAXIMUM ALLOWABLE SOIL LOSS: $E_{max} = H_{max}/(2FT+3D)A$

$$E_{max} = H_{max}/(2FT+3D)A, \quad H_{max} = 50,000$$
$$= 238.1 \text{ tons/acre/year} \geq 92.9 \text{ tons/acre/year} \Rightarrow \text{OK}$$

Coastal Hazard: Class A waters are approximately 13,200 feet from the site.

CONCLUSION: Sedimentation hazard to coastal waters and downstream properties is minimal. Erosion rate computed for this project site is within the tolerable limits and additional control measures are not required.

4. REFERENCES:

1. Soil Conservation Service (USDA); 'Guidelines For Use of the Universal Soil Loss Equation in Hawaii,' Technical Notes, March 1975. (Revised Draft)
2. County of Maui; (Ord No. 816), 'Chapter 24, Soil Erosion and Sedimentation Control,' June 13, 1975.
3. Soil Conservation Service (USDA); 'Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai; State of Hawaii, August 1972.
4. Hawaii Environmental Simulation Laboratory; 'Guidelines for Data Preparation, Part 1: Universal Soil Loss Equation; Undated (Draft).